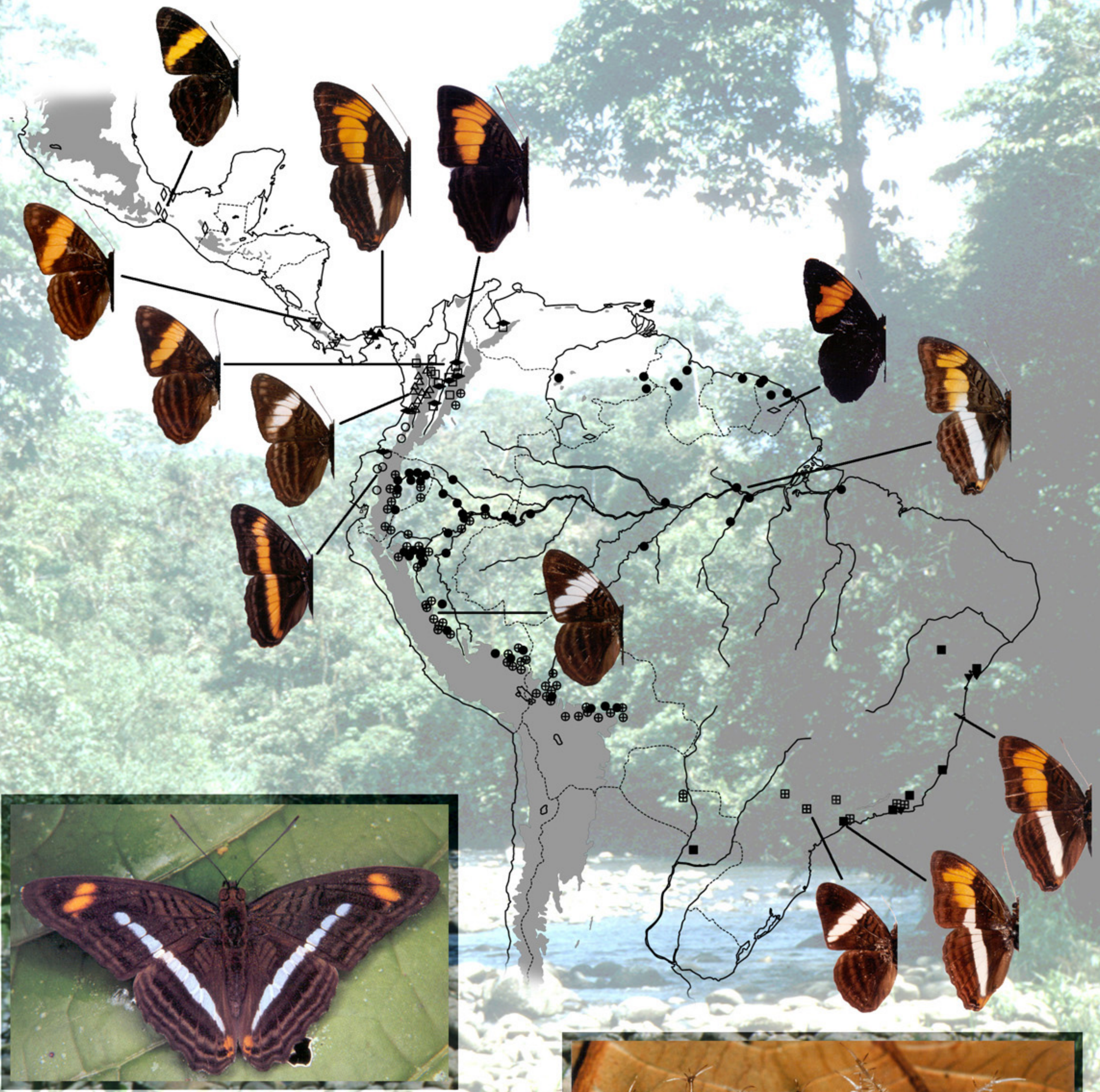
The Genus *Adelpha*: Its Systematics, Biology and Biogeography

(Lepidoptera: Nymphalidae: Limenitidini)



Keith R. Willmott

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FRONT COVER: *Background*: Río Pindo Grande, east Andean foothills in Ecuador, the most diverse region for *Adelpha*. *Foreground*: distribution and geographic variation of *Adelpha ethelda* and *Adelpha melona*. *Bottom left*: male *Adelpha iphiclus estrecha* feeding on sweat on a leaf, western Ecuador. *Bottom right*: Fifth instar larva of *Adelpha phylaca pseudaethalia*, Costa Rica (by Jim Mallet).

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SUMMARY

A revision of the diverse neotropical nymphalid butterfly genus *Adelpha* is presented, which includes discussion of the systematics, biology and biogeography of all constituent taxa. I review the history of classification of the genus, characterise the genus by its adult morphology, and provisionally recognise six principal species groups. The status of all published names is critically examined and the identity and location of associated type material is discussed. Lectotypes are designated for 30 names, and neotypes for three names. I present a synonymic checklist that includes all 366 described names, and recognise 85 valid species and 209 valid taxa. Sixty one names are placed newly in synonymy and 66 further new or revised taxonomic combinations are made, and one new species and nine new subspecies are described: *Adelpha atlantica* **sp. nov.**, *Adelpha corcyra dognini* **ssp. nov.**, *Adelpha corcyra salazari* **ssp. nov.**, *Adelpha erymanthis fortunata* **ssp. nov.**, *Adelpha fessonia ernestoi* **ssp. nov.**, *Adelpha leucophthalma smalli* **ssp. nov.**, *Adelpha melona neildi* **ssp. nov.**, *Adelpha paraena lecromi* **ssp. nov.**, *Adelpha radiata romeroi* **ssp. nov.**, *Adelpha seriphia barcanti* **ssp. nov.**. In addition to a dichotomous key for identification of adult *Adelpha*, notes on the taxonomy, variation and identification of all taxa are presented. I also list the locality data and depository of 20,796 specimens of *Adelpha* examined and discuss the known and expected geographic and elevational ranges of all taxa.

The biology of the genus is reviewed, based on published data and approximately two years field work in six neotropical countries. I summarise the current knowledge on the habitats, phenology and rarity of all species, and conclude that the majority of species that are rare within a single site are rare throughout their range; thus "suffusive" rarity predominates in the genus. Beyond the difficulties of sampling, there is little evidence for what causes rarity in any individual species. Literature and unpublished records of larval hostplants for all species are compiled and *Adelpha* species identifications corrected. Hostplant records exist for at least 42 species of *Adelpha*, comprising 22 families, 66 genera and 116 species of plants, and this is one of the widest host breadths of any nymphalid genus. Published and unpublished information on immature stage morphology and biology exists for 37 species, and I discuss possible characters that may be of phylogenetic value. I review our scant knowledge of *Adelpha* adult ecology, and discuss the evidence for mimetic convergence of wing patterns between unrelated *Adelpha* species. Given the apparent lack of unpalatability in the genus, *Adelpha* may be one of the best examples of mimicry based on the unprofitability of pursuit for predators due to rapid escape ability.

I analyse patterns of diversity and endemism of *Adelpha* species and taxa within the Americas and between biogeographic regions and countries. Regional *Adelpha* species richness peaks just north of the equator, but shows a similar, south-skewed asymmetry reported for other major groups, which relates to the presence of the diverse Atlantic biogeographic region in southeastern Brazil. Latitudinal species turnover peaks at the edges of major biogeographic regions (Transandean, Andes, Amazon, Atlantic), and distribution of range edges is significantly non-random, refuting predictions of random or null models for the distribution of diversity. There is no evidence for a decrease in latitudinal range towards lower latitudes, and density of range edges is lowest at the equator, providing no support for the Rapoport effect as a causal factor for the equatorial peak in species richness. Community species richness in *Adelpha* peaks in the foothills of the eastern Andes in an arc from southern Colombia to northern Bolivia, where almost half the species in the genus are predicted to occur in forests between 450-600m in elevation. Richness drops sharply away from the base of the Andes and then declines almost imperceptibly east across the Amazon basin, with sites throughout the Amazon containing only 60-70% of the diversity of the Andean foothills.

Regional *Adelpha* species richness peaks between 700-1000m elevation, with 87% of the genus occurring from 700-800m. Similar patterns are observed for community species richness in transects through the Ecuadorian Andes, which peaks at 600m on the eastern slope and 800m on the western slope. While the lowland eastern slope has higher richness than the lowland west, montane faunas are of equal richness. Locally high rates of species turnover along the elevational gradient argue against elevationally correlated environmental variables, or random range distributions, as important factors in explaining the lower-middle elevation peak in species richness. Instead, there is evidence that *Adelpha* faunas are zoned, comprising well-defined lowland and montane faunas, with some evidence for further zonation within the latter. The peak in species richness occurs in the zone of overlap between lowland and montane faunas.

The close larval association of the most primitive species in the genus with the plant genus *Viburnum*, which is of Laurasian origin, suggests that the ancestor of *Adelpha* colonised South America via North America. Several hypotheses are suggested to reconcile the apparent existence of endemic South American *Adelpha*, suggesting evolution in isolation before formation of the Isthmus of Panama, with the observation that most montane Laurasian plant genera reached South America after formation of the isthmus. Regions of species endemism in *Adelpha* are sharply delimited by major geographical barriers to dispersal, and I divide such regions into lowland and montane categories. Areas of subspecies endemism occur in peripheral regions and are generally in agreement with postulated Pleistocene refugia, but most are also defined by modern environmental transition zones. Faunal turnover increases with elevation, and the number of species restricted to a single biogeographic region peaks at lower-middle elevations. I discuss the relative contribution and timing of four mechanisms of montane speciation to the formation of montane *Adelpha* faunas. There is evidence for speciation across elevational gradients early in the evolution of montane faunas, but most recent differentiation of populations and species has occurred in geographic allopatry. The Andean orogeny appears to have had little effect on *Adelpha* faunas as a vicariant event, but the mountain range constitutes an important barrier to dispersal. Sharp changes in faunal composition in the western Andes, with faunas below 1500m being closely related to Costa Rica/Panama but those above showing more affinity with the eastern Andes, are interpreted as the result of the postulated maximal vegetation level depression of 12-1500m during historical climatic fluctutations.

The conservation of *Adelpha* is considered for both species and faunas. Two species of *Adelpha*, *A. herbita* and *A. atlantica*, both endemic to southeastern Brazil, are proposed as threatened, based on current IUCN criteria. Other species that may be future candidates for threatened status are also listed and discussed. Colombia and Ecuador contain the highest numbers of *Adelpha* species, though the former is easily the most diverse when taxa are considered. However, consideration of endemism, species richness, rarity and threat indicates that the Atlantic region faunas are of the highest conservation priority for *Adelpha*. Due to substantial congruence between ranges of *Adelpha*, and overlap of faunas in the Andean foothills, only ten areas of 40km x 40km are estimated to be needed to contain all *Adelpha* species at least once. The location of these areas is similar to areas classed as important for conservation for many other taxa, particularly birds, suggesting that the majority of *Adelpha* will be protected by efforts to conserve "higher profile" taxa.

CONTENTS

INTRODUCTION

The neotropical region is justly famed for its outstanding biological diversity, and nowhere is this more apparent than in its insect fauna, particularly butterflies. Many of the most visually spectacular species are found within the largest family, the Nymphalidae, whose members occur in almost every conceivable habitat and exhibit great variety in their life history strategies. This variety offers a rich area for research into many aspects of evolutionary biology, and just a few of the fields in which nymphalids have made a particularly important contribution include plant-insect interactions (e.g., Brown, 1987a), speciation processes (Jiggins *et al*., 1996; Davies *et al*., 1997), the evolution of mimetic wing patterns through natural selection (Bates, 1862; Müller, 1879) and historical biogeography of the neotropics (Brown, 1979, 1982a,b). In the recent surge of interest in the conservation of biodiversity, one nymphalid subfamily, the Ithomiinae, has been suggested as a suitable indicator taxon of lowland neotropical butterfly diversity (Beccaloni & Gaston, 1994).

Following the monumental work of Seitz ([1907]-1925), species-level systematic research within the Nymphalidae has concentrated on genera with large or “attractive” species, in the Brassolinae (Blandin, 1978; Bristow, 1981, 1982, 1991), Morphinae (Blandin, 1988, 1993), Charaxinae (Comstock, 1961; Barselou, 1983) or the heterogeneous Biblidinae (Dillon, 1948; Jenkins, 1983, 1984, 1985a,b, 1986, 1987, 1989, 1990; Attal & Crosson du Cormier, 1996), or on subfamilies of proven high biological interest, such as the Ithomiinae (Fox, 1956, 1960, 1967; Fox & Real, 1971; Brown, 1980) and Heliconiinae (Michener, 1942; Brown, 1981). Many of these works have illustrated the existence of both undescribed and unrecognised species even in small, well-collected genera, a result that may be widely applicable (Willmott *et al*., in press; Willmott & Hall, in prep.), but that contrasts with general perception that the species-level systematics of most nymphalid butterfly groups is well-resolved (Daily & Ehrlich, 1995; Robbins & Opler, 1997).

Those groups that are neither “collectable” nor model groups for research have attracted less attention, with the notable exception of a large section of the Nymphalinae reviewed by Higgins (1981). Nevertheless, such groups may still provide the types of fascinating discoveries that have motivated research into, for example, the Heliconiinae and Ithomiinae. Without critical systematic study, the foundation for biological research, this store of information remains untapped. A further concern is the continual loss of biological diversity in tropical countries and the increasingly urgent need to catalogue and understand the distribution of such diversity. Among nymphalid butterflies, one of the most conspicuous members in all neotropical forest habitats is the genus *Adelpha*, which is certainly the most speciose genus of the neotropical Biblidinae, and one of the most diverse of the entire family Nymphalidae. Many *Adelpha* species are common, occur in a very wide range of habitats and exhibit in their immature stages a great diversity of behaviour, morphology and hostplant utilisation (Moss, 1933; Aiello, 1984; Ackery, 1988). Previous studies of the early stages demonstrated that adults that appeared superficially similar were often apparently unrelated (Moss, 1933; Aiello, 1984), leading to the suggestion that adult similarity was due to mimicry (Aiello, 1984).

The genus thus offers great promise for biological study, but this has remained unrealised largely due to the problems in identification of many extremely similar species and a lack of understanding of their relationships, and the taxonomic chaos caused by this similarity and the availability of over 350 published names for *Adelpha* taxa. As a result, *Adelpha* has become renowned more for its taxonomic problems than its potential biological interest; Fruhstorfer (1915) states “except the *Phyciodes* and certain *Euthaliidae* there is, therefore, hardly any genus of the Rhopalocera offering greater difficulties to the systematical and synoptical treatment”, while DeVries (1987) echoed this sentiment, saying “the butterflies that compose the genus *Adelpha* are, in my opinion, the most difficult and trying taxonomically of all the nymphalids”. Few can have returned from the field with a collection of *Adelpha* without finding attempts to identify species frustrated by a bewildering variety of forms with few clues to distinguish them; certainly this very feeling stimulated me, in a large part, to undertake this revision. Fruhstorfer (1915) was the last to treat the entire genus, with the exception of D’Abrera’s (1987) pictorial review, but both works offer few reliable characters for separating species, contain many misidentifications, and provide little to no information on species biology or distribution.

The objectives of this work, therefore, are to provide a stable nomenclature for the genus through a critical examination of the status of all available names and to provide information to enable certain identification of all *Adelpha* taxa. Also, I attempt to create a systematic arrangement that reflects modern species concepts and our greatly improved knowledge of the distribution of taxa. As a baseline for future research, I summarise all of the available information on the immature and adult biology of *Adelpha* species. Finally, I analyse the distribution of diversity and endemism within the genus, interpret these patterns in the light of current biogeographical hypotheses, and discuss their implications for the conservation of *Adelpha*, and probably other butterfly taxa.

MATERIALS AND METHODS

Specimens Examined

A total of 20,796 specimens of *Adelpha* were examined and identified in public and private collections, including 16,480 males and 4,316 females. The collection acronyms used throughout the text are listed below, and those in which I have examined all material are marked with an asterisk.

ADF	Alberto Diáz Frances collection, México, Mexico
* AFEN	Andrew F. E. Neild collection, London, UK
AJ	Artur Jasinski collection, Piastów, Poland
* AME	Allyn Museum of Entomology, Sarasota, FL, USA
* AMNH	American Museum of Natural History, New York, NY, USA
AO	Andrés Orellana collection, Mérida, Venezuela
* BMB	Booth Museum of Natural History, Brighton, UK
* BMNH	Natural History Museum, London, UK (M=Main coll.; R=Rothschild coll.; T=Type coll.; MM=Moss coll.; A&B=Adams & Bernard coll.)
CNIN	Colección Nacional de Insectos, Universidad Autónoma de México, México, Mexico
* DAT	David Trembath collection, Surrey, UK
DLF	De la Fuente collection, Caracas, Venezuela
EF	Eurides Furtado collection, Diamantino, Brazil
* ESM	Ernesto W. Schmidt-Mumm collection, Bogotá, Colombia
FIML	Fundación e Instituto Miguel Lillo, Tucumán, Argentina
* FSCA	Florida State Collection of Arthropods, Division of Plant Industry, Gainesville, FL, USA
GTA	George T. Austin collection, Las Vegas, NV, USA
* GWB	George W. Busby collection, Boston, MA, USA
HS	Harold & José L. Skinner collection, Margarita, Venezuela
JB	Joffré Blanco collection, San Cristóbal, Venezuela
JCS	Juan Carlos de Sousa collection, Barquisimeto, Venezuela
* JFL	Jean F. Le Crom collection, Bogotá, Colombia
JYG	Jean-Yves Gallard collection, French Guiana
* KWJH	Keith R. Willmott & Jason P. W. Hall collection, Bristol, UK
LCB	L. & C. Brévignon collection, French Guiana
* LMC	Luis M. Constantino collection, Cali, Colombia
MALUZ	Museo de Artrópodos Terrestres, La Universidad de Zulia, Venezuela
* MECN	Museo Ecuatoriano de Ciencias Naturales, Quito, Ecuador
* MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA
MHNG	Musée d’Histoire Naturelle de Genève, Geneva, Switzerland
* MHNUC	Museo de Historia Natural, Universidad de Caldas, Manizales, Colombia
MIZA	Museo del Instituto de Zoología Agrícola, Universidad Central de Venezuela, Maracay, Venezuela
* MJP	Mike J. Perceval collection, Surrey, UK
MJWC	Matthew J. W. Cock collection, Reading, UK
MLP	Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, La Plata, Argentina
* MNHN	Muséum National d’Histoire Naturelle, Paris, France
* MUSM	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru
MZUJ	Muzeum Zoologiczne Uniwersytetu Jagielloñskiego, Kraków, Poland
NSM	Nevada State Museum and Historical Society, Las Vegas, NV, USA
* PJD	Philip J. DeVries collection, Eugene, OR, USA
PB	Pierre Boyer collection, Le Puy, France
* QCAZ	Pontificia Universidad Católica, Quito, Ecuador
R	Romero family collection, Maracay, Venezuela
* RCB	Robert C. Busby collection, Boston, MA, USA
RDM	Roberto de la Maza collection, México, Mexico
RM	Raymond Murphy collection, Torquay, UK
RMNH	Rijksmuseum van Natuurlijke Histoire, Leiden, Netherlands
SMTD	Staatliches Museum für Tierkunde, Dresden, Germany
STRI	Smithsonian Tropical Research Institute, Canal zone, Panama
TP	Tomasz Pyrcz collection, Warsaw, Poland; incorporated into the MZUJ
UFP	Universidade Federal do Paraná, Curitiba, Brazil
UNAM	Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México, México, Mexico
* USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC, USA
ZISP	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
ZMUC	Zoologisk Museum, Universitets Copenhagen, Copenhagen, Denmark
* ZMHU	Zoologisches Museum, Humboldt Universität, Berlin, Germany
ZSBS	Zoologisches Sammlung des Bayerischen Staates, Munich, Germany

Specimens examined are listed under each taxon by country, in an order corresponding to their geographic position, starting with the USA, then Mexico, east and south to western Ecuador, from Venezuela south along the eastern Andes to Argentina, Brazil, Paraguay, Uruguay, Guyana, French Guiana, Surinam, Trinidad and the Caribbean. Provinces, states or departments within each country, and localities within each of these subdivisions, are listed in alphabetical order. Words such as “Río”, “Quebrada”, “Mount”, “Volcán”, “Puerto”, “via” and “El/La” are treated as part of the name, but not relational phrases such as “nr.”, “vic.”, “env.”, “region”, “above”, “head”, all compass points (N., E., S., W. etc.) and “km” or “mi.” from a locality. Collection sites within each country were located using atlases in addition to Brown (1941), Lamas (1976), Brown (1979), Jenkins (1983, 1984, 1985a,b, 1986, 1987, 1989, 1990), Official Standard Names Gazetteers published by the U. S. Board on Geographic Names, Washington, DC, USA, and the National Imagery and Mapping Agency’s (NIMA) online Geographic Names Database (GNDB) (http://gnpswww.nima.mil/geonames/GNS/). Sites that I was unable to precisely locate are listed at the end of each country subdivision or country, or under “country unknown”. The names of localities are as given on the original label, even when the locality has undergone a subsequent change of name (e.g., Pará to Belém). Countries, political subdivisions or localities represented only by specimens with label data that I consider erroneous are enclosed in quotes, with the exception of general labelling centres such as “Bogotá”, which essentially denote a region rather than locality. For each specimen I list the number examined, sex, collection locality and altitude when given, date, any notes of interest on accompanying labels, and the collection. In a number of cases specimens were examined that are transitional between subspecies, or exhibit other significant external phenotypic variation, and these are marked with various symbols keyed immediately at the top of the list of specimens for each taxon. For each species I list the total number of specimens examined, and the number of each sex in parentheses for each taxon and country. In a very few cases I have listed specimens examined only by photograph, where these are unique or of very rare taxa, and I state where this is the case in the taxonomic discussion. The range maps are based entirely on specimens that I have personally examined, either in collections, by photograph, the field, or, in one case (*A. herbita*), a coloured drawing. Locality data for taxa based on field work, literature or personal communication are presented following the list of specimens examined.

Identification of Type Specimens

One reason for confusion regarding the application of *Adelpha* names to taxa is the difficulty in identification of type specimens, and I have attempted to locate all extant type material of available *Adelpha* names. The great majority of names have been based on type series rather than a single type specimen, and there is the possibility of mixed type series for many taxa. Most early authors gave no indication of the number of specimens on which they were basing their descriptions, and their material must therefore be regarded as syntypic, even if only a single specimen is known. I designate lectotypes or neotypes for all names that are not sufficiently well described to apply unambiguously to a particular taxon, and lectotypes for those that clearly apply to several taxa on the basis of the syntypic series.

It appears that no authors attached type labels to *Adelpha* material on which they based names prior to the Felders in the 1860s, and the same is true of many subsequent authors. In the absence of an original figure sufficiently detailed to identify the specimen on which it was based, or a specimen labelled specifically as a type by the original author, I believe there is an element of doubt surrounding the validity of all other type material. I have therefore tried to base my application of a name first and foremost on the original description, and to examine critically all labelled and unlabelled potential type material in the light of this description. I have been able to locate type material in the collections examined of almost all described *Adelpha* taxa. Notable exceptions are certain types of very early authors such as Linnaeus, Cramer, Godart, Drury and Walch, and these specimens are, in most instances, probably lost or destroyed. The Linnaeus butterfly types are currently under study by Martin Honey at the BMNH (pers. comm.) and are located in London, Cramer types are either in the RMNH or the BMNH (Vane-Wright, 1975), Godart types should be in the MNHN (Horn & Kahle, 1935-37), Drury types should be in the BMNH, and the whereabouts of Walch's collection is unknown (Horn & Kahle, 1935-37). Of the names lacking types, only the descriptions of Linnaeus and Walch are too vague to permit unambiguous identification, and I discuss these problems under the appropriate taxa.

The collections of most of those authors who published descriptions of *Adelpha* are now at the BMNH, including those of Hewitson, Butler, Bates, Boisduval, the Felders, Godman and Salvin and Fruhstorfer (Horn & Kahle, 1935-37). In the case of these authors, I identified type specimens using the original description and figure, specimen label data indicating the collection of origin, the locality, the collector and any other important information, particularly hand-written labels of the original author identifying the taxon. Horn & Kahle (1935-37) figure examples of hand-written labels of Hewitson, Butler, the Felders, Boisduval and Fruhstorfer, in addition to other lepidopterists who published on *Adelpha*. The Felders also applied a particular type of label to their type specimens, which bears a gold and a black stripe and the name, and recognising their type material presents no difficulty. Identification of Fruhstorfer type material is, however, often problematic, for several reasons. The original locality labels on many Fruhstorfer specimens were subsequently removed and new, typed labels indicating only the country of origin substituted, probably prior to the sale of the collection. Thus the originally cited type locality often does not match the label data. Putative Fruhstorfer type specimens may bear either or both of a red, typed "TYPE" label and a label with the identification of the taxon written in Fruhstorfer's hand. Often only one of these labels is present, but several specimens that are not types also bear such labels. Occasional specimens lack either of these labels and have been identified as syntypes through other information in the original description. Fruhstorfer described a number of taxa based on specimens in Rothschild's collection at Tring Museum, which is now also housed at the BMNH, separate from the main collection. A small number of Fruhstorfer's types are to be found at various other European museums, and I am grateful to Gerardo Lamas for providing photographs of such specimens.

Given the uncertainty surrounding the validity of type material of many older names, I have tried to list full specimen label data for such types. Full label data are enclosed by quotes, with data on separate labels separated by a "//". Occasionally I have added supplementary information on the type of label in square parentheses. I use the abbreviations HT, AT, ST, PT, LT, PLT and NT to refer to holotype, allotype, syntype, paratype, lectotype, paralectotype and neotype, respectively. Under "type locality" ("TL") for each taxon I give that cited in the original description; if this is clearly erroneous, or does not match the label on the type specimen (which may have been replaced at a later date), I discuss this in the text. For names where I have designated a lectotype or neotype, I also give the type locality as cited in the original description as "OTL". I have enclosed in square brackets details about the type locality that were not given in the original description itself, but in the title or indirectly given elsewhere in the work, in addition to the country if this was not originally given.

Field Work

In addition to museum research, I conducted field work in six neotropical countries, including Mexico (3 weeks), Guatemala (1 week), Costa Rica (4 weeks), Venezuela (3 weeks), Bolivia (3 weeks), and Ecuador (19 months). Many *Adelpha* specimens in museums are vaguely and/or unreliably labelled, and establishing certain sympatry or otherwise of phenotypes is difficult when based exclusively on such data. During field work I gathered first hand information on the sympatry of phenotypes, collected series of specimens to study the stability or variability of wing pattern characters and recorded ecological observations of possible taxonomic importance. I decided to concentrate my efforts in a single country, Ecuador, which contains an estimated 71% of the species in the genus, since it seemed more useful to gain a deep understanding of the fauna of a single country rather than a superficial acquaintance with the faunas of several. In fact, this proved to be an effective strategy, and some of the most intractable taxonomic problems in the genus, such as the true diversity and identification of members of the *Adelpha serpa* group, and the taxonomic status of *A. iphiclus* and *A. iphicleola*, were solved with the help of collections made in eastern Ecuador. In addition to making collections of specimens, elevational distributions of species throughout the country were recorded, to provide information in interpreting broad patterns of *Adelpha* species richness and endemism. Observations were also made on adult food sources and the microhabitat preferences, perching and flight behaviour of species.

Field work in Ecuador was conducted on both slopes of the Andes, from sea level on the western slope and 250m on the eastern slope to well above the upper elevational limit of *Adelpha* species (the latter approximately 3000m). Sites included as wide a range of topography, vegetation and microhabitat types as possible, including both flat and undulating terrain, paths along ridge tops, hill sides and river sides, in primary to heavily disturbed secondary growth habitats, ranging from dry deciduous forest to pluvial forest, premontane rain and montane cloud forest. Sites were visited from 6.30am to 5pm, when *Adelpha* activity ceased. I made observations of individuals using Canon 8x32mm waterproof binoculars, and used two techniques to capture specimens, an entomological net with extension handles of up to 5.5m, and baited traps. Traps were of the Van Someren-Rydon design as figured by Sourakov & Emmel (1995), and were deployed in a variety of microhabitats, including forest edges, river sides, forest light gaps and the forest subcanopy. Traps were set at a variety of heights above the ground up to 15m, by use of polyethylene string looped over branches by a lead fishing weight. I used two types of bait; three to five day old fermenting banana, and one to three week old rotting fish, of a variety of fresh and saltwater species. Different species of fish produced no noticeable alteration in the attractiveness of the bait. Traps were patrolled approximately once per hour, and carefully lowered to check for individuals resting on the outside of the netting, a common occurrence in *Adelpha*. Once I was familiar with the fauna, I was able to identify and release the great majority of specimens in the field, and these sight records are listed under “Additional locality data” for each taxon. Specimens of taxonomic interest were killed by a pinch to the thorax and stored in glassine stamp envelopes in a wooden entomological box, and subsequently prepared in the USA.

Morphological Study

The wing patterns of all species were studied through examination of material in collections, except for *A. herbita*, for which only the illustration in the original description is known. I examined the male genitalia of all species (with the exception of *A. herbita*), typically the nominate subspecies of each, and any others that exhibit significant phenotypic differences and/or have been regarded in the past as distinct species. In most cases, where material was available, I examined several specimens of each species to assess intraspecific variation. Due to the rarity of females of many species, my choice of dissections was limited, both of the species I studied and the number of specimens. Specimens dissected are listed in Appendix A. I also examined the wing venation for all species except *A. herbita* and *A. atlantica*, and the morphology of the legs, antennae and labial palpi for representative species from all species groups. Appendages and genitalia were prepared for dissection and study by soaking in hot 10% KOH for 15-30 minutes, being subsequently stored in glycerol. Drawings were made using Wild M4A stereomicroscope at 30x magnification and a Wild camera lucida. Wing venation was studied and drawn using the same equipment as the genitalia. Terminology for the wing venation follows Comstock & Needham (1918), and I refer to a wing cell or cells by the veins which bound the cell(s). Genitalic terminology follows Klots (1956), and I use the term “clunicula” (Fruhstorfer, 1915) to refer to the dorsally-directed projection on the inner edge of the male genitalic valvae, which is adorned with numerous tiny spines on the inner surface.

I was able to obtain preserved material of various immature stages of a few species on loan from individuals (P. DeVries, W. Haber) and public institutions. Such material typically consisted of cast head capsules, larval skins and pupal cases, and in a very few cases, dried larvae. The morphology was studied using the same microscope as for adult material; due to the rarity of preserved material, it was not possible to use scanning electron microscopy. Colour slides and black and white photographs of the immature stages for several species were given to me by J. Mallet, A. Muyshondt (see Figs. 117-123) and R. Boender, and published illustrations and sketches were also examined.

Taxonomic Philosophy

In many cases the taxonomy that I have adopted, at both the specific and subspecific level, differs significantly from that of previous workers. Although Mayden (1997) argues persuasively that only one concept of species category is philosophically sound, the definition of species taxa is still an intractable problem for taxonomists, principally because names denoting distinct entities are incompatible with the continuum of genetic differentiation and reproductive isolation between populations that is biological reality (Murphy & Ehrlich, 1984; Collins, 1991). The criteria used to define species largely depend on which species definition is adopted and the primary goal of the classification (Collins, 1991; Mayden, 1997). I believe that the primary purpose of species-level classification is to be of use to biologists involved in research on the organisms. Such a classification can be of use in two principal ways; by allowing effective communication among researchers and ready identification of taxa, and by having predictive value for taxa whose biological traits are unknown.

Speciation occurs when two lineages diverge towards separate evolutionary fates (although they may subsequently converge). The existence of distinct lineages can be inferred from sympatric existence of genotypically distinct individuals, that may (Mayr, 1942, 1963) or may not be completely reproductively isolated, or from maintenance of genotypic integrity within hybrid zones (e.g., Jiggins *et al*., 1996; Mallet, 1995, 1996). In the absence of any genetic studies on *Adelpha* populations, and little other ecological or behavioural information available, morphological phenotypic characters alone must serve in virtually all cases as a surrogate for genotypic characters.

Determining whether or not distinct but allopatric phenotypes should be accorded specific status is almost always a matter of judgement and opinion, though I have had to deal with relatively few cases in *Adelpha*. There has been no research into the status of hybridising parapatric *Adelpha* populations; indeed, contact zones are virtually unknown. I have therefore used characters that are reliable in distinguishing sympatric species, and that show little or no variation throughout the range of monotypic species, as evidence as to whether or not two allopatric populations should be treated as distinct species. It goes without saying, however, that such characters may have little relevance to the genetic basis for the maintenance of distinct species (Murphy & Ehrlich, 1984; Collins, 1991). In the great majority of cases, I have treated isolated taxa that are closely allopatric and occur in similar habitats at similar elevations, and that do not differ from each other by any “reliable” character (as defined above), as constituting the same species, while remaining aware that all such taxonomic hypotheses require testing in the field. The uniting of such populations as a single species provides two important pieces of information: that they are not known to be sympatric, and that they are considered sister taxa, even in the absence of a synapomorphy (such species were termed “paraspecies” by Ackery & Vane-Wright (1984)). They almost certainly also share similar biological traits and the classification is more informative. Tyler *et al*. (1994) used similar criteria in their classification of American swallowtails, and I regard it as the most useful first approach to classifying *Adelpha*. In one case I have departed from this method, namely in my treatment of *Adelpha epione* and *Adelpha ethelda*, and I discuss my reasons for this in the accounts of those species.

My approach to classifying *Adelpha* at the species level has led to the grouping in some cases of taxa that have very distinct dorsal wing patterns and have in the past been placed in different species groups. Examples include *A. ximena ximena* and *A. ximena mossi*, *A. messana messana* and *A. messana delphicola*, and *A. malea malea*, *A. malea aethalia* and *A. malea fundania*. Typically these taxa show little variation over their range and specimens transitional to other subspecies, if known, originate from a relatively very narrow zone of apparent hybridisation. Another classic example is the common *A. lycorias*; individuals of *A. lycorias lara* are phenotypically indistinguishable from Trinidad to northern Argentina, yet in eastern Colombia specimens clearly transitional to *A. lycorias melanippe* occur, which is also phenotypically stable throughout much of central Colombia. Although genetic and mimetic wing pattern characters may show geographic discordance (e.g., in northwestern South American populations of the heliconiines *Heliconius erato* and *Heliconius melpomene* (Brower, 1996)), wing pattern may be an important visual cue in inter- and intrasexual interactions (Silberglied, 1984) and thus contribute to pre-mating reproductive isolation between distinctive phenotypes. In addition, increased predation on hybrids between distinctive mimetic phenotypes may exert strong, divergent selection on the two parental phenotypes, possibly promoting speciation (Joron & Mallet, 1998; Mallet *et al*., 1998). In this context, recognition of subspecies that differ in mimetic dorsal wing pattern as potentially significant evolutionary entities is theoretically defensible, and certainly assists in their identification. Recently, two pairs of *Heliconius* taxa formerly regarded as conspecific have been treated as distinct species (Jiggins *et al*., 1996; Jiggins & Davies, 1998); one can only imagine the difficulties of tracing, for example, literature hostplant records or locality data to the correct species in the absence of subspecies names.

At the other end of the phenotypic variation spectrum occur taxa that exhibit continuous, clinal variation in several characters over their geographic range. While opposite ends of the cline may be phenotypically quite distinct, and have often received names (bringing the subspecies concept into much disrepute (e.g., Murphy & Ehrlich, 1984; Collins, 1991)) since there is no clear character to identify specimens from intermediate localities I regard the entire population as a single taxon. This decision not to formally taxonomically recognise populations at the ends of clines is, however, based on purely operational criteria. Genotypic and phenotypic differences between populations at the ends of clines may be just as great as between isolated, non-interbreeding, phenotypically stable populations, or even between sympatric species, and there seems to me to be no reason to regard gradual and discrete variation as necessarily representing fundamentally different processes (e.g., Mayr, 1963). In certain cases, even when there is some clinal variation, a consistent phenotypic gap may separate two populations. I believe it is often worthwhile recognising such phenotypic gaps by application of subspecies names to the two populations, since it may help reveal geographic areas where the differentiation of populations frequently occurs. Assessing whether or not geographic variation is discontinuous is complicated in many cases due to the lack of series of reliably and precisely labelled specimens in collections. I have generally adopted a conservative approach with existing names where I have insufficient material to determine the nature of geographic variation (with several notable examples in Atlantic Brazil), since retaining subspecies names provides more information than synonymising them, and I leave assessment of their validity to field workers in each region.

SYSTEMATICS

History of Classification

The first *Adelpha* species, probably all originating from the Guianas, were described by Linnaeus in 1758, in the genus *Papilio*. Linnaeus described three names, two in his phalanx Barbarus, and one in the Phalerati section of the phalanx Nymphalis, both groups based on wing shape and variable wing pattern characters. There are taxonomic problems surrounding all three of these names, discussed under *Adelpha cytherea* and *Adelpha iphiclus*. Probably more species were represented in collections in the latter half of the eighteenth century than is reflected by the description of names, since early authors regarded even relatively distinct taxa, such as *Adelpha naxia*, *A. iphiclus* and *A. serpa*, as constituting the same species. Following single descriptions in the genus *Papilio*, accompanied by figures, by Walch (1775) and Cramer (1777, 1779), Latreille (1809) described the first Andean species, *leucophthalma*, in the genus *Nymphalis* Latreille, 1804. Hübner ([1819]: 42) introduced the genus *Adelpha* for eight listed species, including *A. mesentina*, *A. iphiclus* (as *A. basilis*), *A. serpa diadochus* (as *A. iphicla*), *A. plesaure* (described shortly after by Hübner (1823a)), *A. cocala* and *A. cytherea*. Hübner also listed *Adelpha elea*, described by Linnaeus as *A. eleus*, which is here considered a synonym of *A. cytherea*, and *A. phliase*, which is in fact a member of the family Riodinidae, *Synargis phliasus* (Cramer). He omitted *A. capucinus*, which has only been mentioned twice since its original description prior to this revision, and *A. leucophthalma*, possibly because it lacked the vertical dorsal bands typical of the other *Adelpha*. As can been seen by the inclusion of a riodinid, Hübner based the genus purely on wing pattern and shape, and failed to name a type species, placing it in his Familia D, which contained genera with a typically brown ground colour to the wings. Scudder (1875) subsequently selected the first named species, *Papilio mesentina*, as the type species of *Adelpha*. Hübner's generic name *Adelpha* was largely ignored by subsequent authors, with the notable exception of several German lepidopterists, and Godart ([1824]: 335-342) soon after treated the species in the genus *Nymphalis* Latreille, with a number of other unrelated Nymphalidae. Godart, however, provided an important review of the previous taxonomy of all species (except of course *A. capucinus*) with supplementary descriptions, and made the first major contribution to the description of *Adelpha* taxa, with five new species. Two years later, Boisduval (1836: pl. 8, fig. 4) introduced the new generic name *Heterochroa*, along with a new species, *Heterochroa serpa*. There was no description accompanying the colour plate or indication of other included species, and *serpa* therefore becomes the type species of *Heterochroa* by monotypy (Hemming, 1967). Geyer (1837) was the first author, with the exception of Hübner, and the last for several decades, to use the name *Adelpha*, when he described the species *bredowii*. Although the generic name of this species has oscillated almost continuously since its original description between *Adelpha*, *Heterochroa* and *Limenitis* Fabricius, the species is most closely related to members of the *A. serpa* group, as discussed below, and belongs in the genus *Adelpha* as conceived here.

The year 1847 saw the publication of Hewitson's first paper on neotropical butterflies and the start of the most intensive period of activity in neotropical taxonomy, including the genus *Adelpha* (see Fig. 1). Hewitson (1847) described eight valid *Adelpha* species under the name *Heterochroa*, from throughout the neotropics, including the formerly almost unexplored Andean region, and three years later, in 1850, a further four. The number of described species in the genus almost doubled during this time. His descriptions were notable for their great attention to detail and their accurate figures, and he was the first to appreciate the great importance of ventral wing pattern characters, particularly in the forewing discal cell, in distinguishing species. Westwood (1850: 276) provided the first detailed description of the external morphology of *Adelpha*, though he also mistakenly used the name *Heterochroa*, listing *Adelpha* as a synonym. He did not give any character to define the genus, but stated that it was closely related to *Limenitis*, and possibly the apaturine genus *Apatura*. He listed the majority of described species and their synonyms, with the exception of *capucinus* and *bredowii*, the latter being placed in the genus *Limenitis*. The name *marse* was also listed under *Heterochroa*, but Westwood (1850: 304) subsequently correctly noted that it belonged in the apaturine genus *Doxocopa*.

Fig. 1. Cumulative number of valid described species and taxa of *Adelpha* since the time of Linnaeus (1758).

The name *Heterochroa* gained widespread acceptance in the lepidopterological community in the two decades following the publication of Hewitson's and Westwood's works, during which time the number of described species of *Adelpha* almost doubled again. This was due largely to the papers of Bates (1864, 1865, 1866), Butler (1866), Hewitson (1867a,b), and the Felders (1861, 1862, 1867). In particular, Felder & Felder's (1867) report on the collections made during the voyage of the Frigate "Novara" around the Earth is notable for containing the descriptions of nine valid *Adelpha* species, a number second only to Fruhstorfer (1913, 1915). The majority of these originated along the northern coast of South America, with a number from mountainous areas in Venezuela and Colombia. However, the lack of figures in this work resulted in much taxonomic confusion in years to come.

Kirby (1871) finally correctly restored the name *Adelpha* and placed *Heterochroa* in synonymy, and provided a thorough synonymic catalogue of all published names in the genus. Although many of his taxonomic conclusions were decidedly questionable, this catalogue provided the basis for future research. Throughout the 1870s Butler was the most noticeable author of new *Adelpha* taxa, and the next important work to treat a large portion of the genus was Godman & Salvin's (1884) review of Central American species. They described in further detail the external morphology and appear to have been the first authors to have examined the male genitalia, and made two principal observations; that all species were remarkably uniform, and that species of *Limenitis* were scarcely distinguishable. They also figured many species, the majority of which were correctly identified, and arranged the species in the form of a key. One might regard this as the first attempt to define species groups within the genus, but this was not a explicit goal and many of the resulting species groups are artificial. Nevertheless, their arrangement, beginning with species with entirely black hindwings and oblique or straight orange forewing bands, such as *A. lycorias melanthe* and *A. boreas*, is reflected in the curation of most major museum collections and has been followed by almost all subsequent authors (Fruhstorfer, 1915; Hall, 1938; DeVries, 1987; Neild, 1996). They also united for the first time the more derived members of the *A. serpa* group.

A relatively static period followed, until the arrival of Fruhstorfer (1907, 1908), culminating in the best known work on *Adelpha*, the revision of the genus in the Macrolepidoptera of the World (Fruhstorfer, 1915). Fruhstorfer's revision is at times inexplicably careless, occasionally surprisingly insightful. He also failed to find any single character to define the genus irrespective of *Limenitis*, and his arrangement of species was based largely on a variable character of the forewing venation, dorsal wing pattern, and the presence or absence of the clunicula in the male genitalia. Inspired, no doubt, by the recent introduction of trinomial nomenclature to designate geographic races (Jordan, 1896), Fruhstorfer (1913, 1915) described a very large number of infraspecific names, and although many were based on insignificant wing pattern variation, 28 names are recognised in this work as denoting valid subspecies. He recognised a total of 91 species and described eleven valid new species, but despite appearing to have examined some type specimens of earlier authors, he still made a great number of errors and misidentifications, many of which have been propagated through the literature until very recently. The plates are still widely used to identify *Adelpha* taxa, yet they too contain numerous mistakes and incorrect names. Perhaps Fruhstorfer's most important contribution was the recognition and description of a number of superficially similar southeast Brazilian species, and he was the first to recognise that "orange and white banded" *Adelpha* contained many more species than had previously been appreciated, several of which he described.

It is arguable whether the plethora of new names authored by Fruhstorfer, many with breathtaking brevity, resulted in more subsequent taxonomic confusion than clarification. Hall (1938) made an attempt to assess the validity of many of the names after Fruhstorfer's collection, including most of the type material, was transferred to the British Museum. Hall (1938) synonymised many of the subspecific names and also authored several himself, including two species. There followed a period of remarkable calm, a period of thirty-five years in which not a single valid *Adelpha* taxon was described (see Fig. 1), as attention perhaps turned more to the biology and higher level classification of butterflies. During the latter part of this period William T. M. Forbes had been working on a review of *Adelpha*, which remained unfinished and unpublished at his death in 1968; his manuscript now resides in the library of the MCZ. Forbes separated the genus into two groups, the *A. serpa* group, in which he also, correctly, included *A. bredowii*, and the remainder. At the species level, Forbes clearly recognised the importance of establishing wing pattern element homologies to identify species, and noticed that the similar dorsal patterns of some species (*A. iphiclus* and *A. naxia*) were derived from different pattern elements. Having made these promising discoveries, however, Forbes failed to follow his logic through and create a new arrangement of species to reflect phylogeny, rather than the convergence of wing patterns in unrelated taxa. Perhaps he intended to do this with further study - certainly his manuscript is in rough, working condition and far from finished. Except for beginning with *A. bredowii*, he followed Godman & Salvin (1884) and Fruhstorfer (1915) in arranging the species starting with *A. lycorias* and "oblique orange-banded" species (e.g., *A. saundersii*, *A. salmoneus*, etc.), followed by species with a complete, vertical orange forewing band and white hindwing band, then those with a white band on both fore and hindwing and orange forewing subapical spot (including the *A. iphiclus* group, *A. naxia*, *A.* (*malea*) *ixia*, *A. abia*, etc.). He finished with derived *A. serpa* group members, and recognised six species: *hyas*, *serpa*, *seriphia*, *paraena*, *pione* and *egregia*, though he included several distinct species under each of the first three names.

Two papers by Beutelspacher (1975, 1976), in which three species of Mexican *Adelpha* were described, marked a brief period of revival in interest in the genus, during which a new Colombian species was also discovered (Steinhauser & Miller, 1977). DeVries & Chacón's (1982) description of a remarkably distinct new species from Costa Rica gave indication that there were still *Adelpha* taxa awaiting discovery. At the start of a recent surge of interest in *Adelpha* systematics, and at a time which is proving to be a veritable renaissance period for butterfly taxonomy in all groups (see Fig. 1), Willmott & Hall (1995) described two highly distinctive new species from Ecuador. Neild (1996) followed with the description of nine new subspecies from Venezuela, in one of the most taxonomically important works to date on the genus. Neild (1996) was the first to recognise that the "*A. ixia*" of previous authors actually included three distinct species, *A. messana*, *A. malea ixia* and *A. barnesia leucas* (though Forbes independently noted *messana* as a distinct species), and was one of the few modern authors to appreciate the value of ventral wing pattern characters in species identification, in particular among certain phenotypically very similar Amazonian species. Willmott & Hall's (1999) description of a further two new species and seven new subspecies from Ecuador, and the number of new taxa described in this work, demonstrate that our understanding of the diversity of *Adelpha* is still far from complete.

Generic Relationships

Adelpha is currently placed in the subtribe Limenitidina, tribe Limenitidini, and subfamily Biblidinae of the family Nymphalidae (Harvey, 1991; the name Biblidinae has chronological priority over Limenitidinae (G. Lamas, pers. comm.)). However, the higher level systematics of the Nymphalidae are still keenly debated, and the classification of higher taxa and their relationships remain controversial. As yet, there is no evidence to suggest that the Biblidinae comprises a natural (monophyletic) group of taxa, it merely contains those taxa that do not belong in other recognised subfamilies, and it has been retained by modern taxonomists largely for convenience (Harvey, 1991; Neild, 1996; Brower, 2000). The relationships of the Limenitidini to the neotropical Coeini, the pantropical Cyrestidini and the Biblidini, the latter including most of the remaining neotropical species, or indeed any other nymphalid groups, are not known; the most recent phylogenetic work in the Nymphalidae suggested a possible close relationship with the Heliconiinae (Brower, 2000).

The tribe Limenitidini includes a large number of species and genera distributed in both tropical and temperate regions throughout the globe, and, discounting long-distance over-water dispersal, it is in all probability an ancient lineage. Chermock (1950) defined the tribe on the basis of a single character, the preservation of the anal vein as a short spur at the base of the forewing cubital vein (see Fig. 2a). This character, however, is not present in one of the genera, *Neptis*, and also occurs in certain members of the Heliconiinae, as noted by Michener (1942) and Brown & Heineman (1972), including the genera *Philaethria*, *Dryas* and *Dryadula* (C. Penz, pers. comm.). Harvey (1991) also defined the tribe on the basis of this character, while noting that a further possible character that may prove to be a synapomorphy for the tribe is the structure of the eggs (Aiello, 1984); all eggs known to date are composed of concave, hexagonal facets with setae at the interstices. Harvey (1991) stated that the eggs of members of the Parthenina were unknown, but I can confirm, from dissection of the female of *Parthenos sylvia*, that they also have this characteristic structure. Clearly, both of these potential synapomorphies require verification through assessment of more taxa and cladistic analysis, but this is a formidable undertaking.

Harvey (1991) recognised four subtribal divisions within the Limenitidini, corresponding to groups of various taxonomic rank recognised by earlier authors (Chermock, 1950, and references therein; Eliot, 1978), including the Neptina, Limenitidina, Parthenina and Euthaliina, all of which were defined by Eliot (1978) on the basis of wing venation. The character given by Eliot (1978) to define the Limenitidina is the origin of the hindwing humeral vein at or before the origin of vein Rs-M_1-M_2. However, wing venation is likely to be highly variable (it is even in a single species of *Adelpha*, *A. lycorias*, see Fig. 2), and there is no evidence whether the characters of Eliot represent apomorphies or plesiomorphies. While the Euthaliina and Neptina probably constitute monophyletic groups, based on the highly distinctive early stages, particularly the larvae, in the former, and the adult morphology and early stages of the latter (Harvey, 1991), there is no evidence that the Parthenina or Limenitidina are monophyletic; they merely include members of the Limenitidini that do not belong in the Euthaliina and Neptina.

The Limenitidina consists of a number of tropical and temperate species whose generic relationships are probably the most poorly understood of the entire subfamily. Most are placed in the catch-all genus *Limenitis*, while numerous generic names have been proposed (see Chermock, 1950), a number of which are no doubt valid. Within the New World, the only representatives of the Limenitidina, and indeed the Limenitidini, are *Adelpha* and four North American species placed either in the genus *Limenitis* or *Basilarchia* (see Scott, 1986). However, the closest relatives of *Adelpha* appear to be several species occurring in eastern Asia, such as members of *Parasarpa* Moore, *Sumalia* Moore, and certain "*Limenitis*". With these species, *Adelpha* shares similar female genitalia (the corpus bursae lacks the additional, spherical structure that occurs in the type of the genus *Limenitis*, *L. populi*, and all North American *Limenitis*) and wing pattern elements, such as a straight postdiscal band on the hindwing, which appear to be derived characters within the Limenitidini (Willmott, 1999, in prep.).

Adult morphology and diagnosis of *Adelpha*

The genus *Adelpha* includes medium to large butterflies with essentially sexually monomorphic wing patterns, consisting of contrasting ventral and dorsal surfaces (see Figs. 32-116). The dorsal surface always has a dark brown ground colour and almost always a postdiscal band on one or both wings, which may be vertical or oblique, and orange, white, or red in colour. The ventral surface typically has a black ground colour which is usually obscured by much reddish brown colouring, and in addition to the postdiscal bands that appear on the dorsal surface it has a number of lighter postdiscal and submarginal lines and other more basal pattern elements (see Fig. 3). Despite the superficially large differences in dorsal pattern between species, all are composed of relatively few pattern elements, particularly the postdiscal band, the postdiscal series and, on the forewing of some species, the submarginal series.

Fig. 2. Morphology of adult *Adelpha*. **a**: *A. serpa serpa*, wing venation; **b,c,d**: base of forewing veins M_2, M_1, R_3-R_5 and R_2, b, *A. lycorias lara*, c, *A. lycorias spruceana*, d, *A. lycorias melanthe*; **e,f**: forewing discocellular vein, e, *A. capucinus capucinus*, f, *A. boreas boreas*; **g,h**: *A. mesentina*, female genitalia, g, dorsal view, h, lateral view; **i,j**: *A. mesentina*, male genitalia, i, lateral view, j, inside of valva; **k,l**: juxta, posterior, lateral and ventral views (left to right), k, *A. alala completa*, l, *A. serpa celerio*; **m**: *A. diocles creton*, posterior view of gnathos; **n**: *A. serpa celerio*, lateral view of aedeagus; **o**: *A. serpa celerio*, sclerotised aedeagal pad, ventral (left) and lateral (right) view; **p,q**: lateral view of eye and labial palpi, p, *A. alala negra*, q, *A. mesentina*.

Fig. 3. Venation and wing pattern elements of *Adelpha*, indicating terminology adopted in the text. Generic synapomorphies are underlined.

Identification of the origin of various areas of the dorsal wing pattern in terms of the ventral pattern elements is often important in distinguishing *Adelpha* species. In almost all species the ventral pattern elements are visible, and more primitive species, such as members of the *A. alala* group (Willmott, 1999, in prep.) (see Table 1), tend to have a greater complement of unmodified pattern elements. The pattern elements that I have recognised in Fig. 3 differ from those recognised by Schwanwitsch (1924) and Nijhout (1991), who both conclude that the nymphalid ground colour is pale and pattern elements are dark. Thus the pale postdiscal and submarginal series and postdiscal band, which play the most important role in species identification, actually constitute ground colour, while the darker areas between are the "pattern". Although Nijhout (1991) rightly points out that few authors have attempted to recognise the system of Schwanwitsch (1924) in description of butterfly wing patterns, I have chosen a terminology for the wing pattern of *Adelpha* that permits discussion and comparison of wing patterns with maximum clarity. It is much simpler to refer to the pale areas of the ventral wing surface in *Adelpha* as pattern elements, while acknowledging that they are not by the definition Schwanwitsch (1924). Of course it is also possible to recognise the pattern elements described by Schwanwitsch (1924) and Nijhout (1991) in *Adelpha*; the basal streak in the discal cell is the wing root band, cell bars one and two are elements b and c, the proximal and distal elements of the basal symmetry system, cell bar 3 on the ventral forewing is the proximal band of the central symmetry system, while cell bar 4 on the forewing, and 3 on the hindwing, and their respective postcellular bars, represent the discal spot. The distal band of the central symmetry system borders the basal edge of the postdiscal band, and the dark areas between the postdiscal series, the outer postdiscal and inner submarginal series, and the submarginal series are elements g, h (border ocelli) and I (parafocal element), respectively (Nijhout, 1991: Fig. 2.17).

Structurally, *Adelpha* is remarkably homogeneous, and detailed descriptions of the wing venation, antennae, eyes, labial palpi and legs are given by Westwood (1850) and Godman & Salvin (1884). The wing venation (Fig. 2a) varies little in the genus, except that the discocellular vein may or may not be present on the forewing, while its juncture with vein M$_3$ may be above or below the origin of vein Cu$_1$ (Fig. 2e,f). The position of the base of vein R$_2$ is also variable within *A. lycorias* (Fig. 2b-d). The eyes are variably setose, with montane species of the *A. alala* group having particularly long and dense setae, while certain species, such as *A. bredowii* and *A. nea*, have naked eyes. The labial palpi may or may not have a pronounced lateral black stripe (Figs. 2p,q), while the thorax is either entirely pale in colour, or has dark bands where the legs rest against the body. Otherwise, all of these structures show little other morphological variation throughout the genus.

The male (Figs. 2i,j, 124-207) and female genitalia (Figs. 2g,h, 208-280) are also both relatively homogeneous, and, contrary to the assertion of Murphy & Ehrlich (1984) that there appear to be relatively few examples of distinct butterfly species with indistinguishable genitalia, almost all closely related species (often clusters of 3-5 species) of *Adelpha* have no observable genitalic differences. This is my experience in many diverse neotropical nymphalid genera, and Murphy & Ehrlich's comment may be due to the very few published revisions of such genera that were available at that time. The male genitalia do show some differences between more distantly related species, particularly in the shape of the valva and distribution of terminal spines, and may or may not have a pronounced projection from the inner edge of the valva (Fig. 2j), termed the "clunicula" by Fruhstorfer (1915). The uncus, tegumen, gnathos and aedeagus vary little, except that members of the *A. serpa* group have a sclerotised pad in the aedeagus on the dorsal surface of the vesica (Fig. 2n,o). The juxta is also relatively uniform, with slight differences in the *A. serpa* group (Fig. 2k,l).

The female genitalia vary somewhat in size, even considering size differences of the adults, but are also structurally simple with few interspecific differences. The lamella postvaginalis and antevaginalis are wrinkled plates which are variably sclerotised, the ostium bursae is always a simple ring which tends to be wider in members of the *A. serpa* group, the ductus seminalis always originates near the ostium bursae and the relative lengths of the ductus bursae and corpus bursae vary little (Fig. 2g). The corpus bursae typically has a pair of sclerotised bands (Fig. 2g,h) which may be dorsal, on the right hand side or ventral, with both inter and intraspecific variation in the position and spacing of the bands. The degree of sclerotisation also varies intra- and interspecifically, as does the size of the spines on the inner surface of the bands, with members of the *A. serpa* group having the most heavily sclerotised and coarsely-spined bands. The terminal tergite of the female genitalia is variably sclerotised at the anterio-ventral edge, in one species (*A. thoasa*) forming a small pouch (Fig. 232b). Similar structures occur in the Asian genus *Neptis*.

While *Adelpha* has been regarded as a distinct genus by the great majority of authors, Chermock (1950) placed it as a subgenus of *Limenitis*, in which he was followed by authors in the following few decades. This was due to the entire absence of structural characters by which to define *Adelpha*, and the retention of the genus by all previous authors has been on the basis of its isolated geographical distribution and the "overall similarity" of most species. Despite an intensive examination of the external and internal morphology of both males and females, I have also been unable to find any structural characters that support the monophyly of the genus. There are, however, several wing pattern characters that suggest that the genus is monophyletic (Willmott, 1999, in prep.). All species of *Adelpha* have a dark brown longitudinal line on the hindwing ventral surface extending from the base of cell 3A-2A to the middle of the anal margin in this cell (Fig. 3, the intervenal stripe, underlined), with the exception of several species clearly closely related to species that do have the character. In many species, this line may be fused to a band of colour that fills the anterior half of the cell, and in several it is broken in the basal half of the wing (derived members of the *A. serpa* group). Species that lack this line also have all the markings in the basal half of the wing reduced, and presumably the line has been secondarily lost. This line appears to be either an intervenal stripe (Nijhout, 1991) or the posterior half of a venal stripe along vein 2A that has become detached from the vein and displaced posteriorly. Almost all species also have a venal stripe at vein 3A on the ventral hindwing (Fig. 3, underlined), which may also be split along the vein into two halves and variously modified or reduced, being almost invisible in some specimens and taxa of the *A. alala* group. Almost all species of *Adelpha* have the postdiscal series fused on the dorsal surface of the forewing to form a subapical marking; in other limenitidine genera the postdiscal series are clearly distinct. Again, the species of *Adelpha* in which the postdiscal series are not fused are derived and closely related to species that do have this character. Preliminary cladistic analyses indicate that a further synapomorphy is the streak at the base of the ventral hindwing discal cell (Fig. 3, the basal streak, underlined), apparently corresponding to the wing root band of Nijhout (1991), which is absent only in the *A. serpa* group (Willmott, 1999, in prep.). Although three of these characters occur in the basal area of the ventral hindwing, it seems unlikely that they represent serial homologues in different cells. While it is conceivable that the venal and intervenal stripe are homologous, venal stripes run perpendicular to more typical wing pattern elements, such as the wing root band (the basal streak) and are considered distinct from them (Nijhout, 1991). The fact that these three pattern elements exhibit little modification throughout the genus is probably due to their lack of connection with or proximity to the postdiscal pattern elements that appear on the dorsal surface and are highly selected for mimicry.

Taxonomy

I recognise 85 species, 35 of which are monotypic, and 209 taxa in the genus *Adelpha*. The synonymic checklist below broadly follows an unpublished cladistic analysis of the genus (Willmott, 1999, in prep.; see discussion in introduction to "Species accounts"), with more primitive species being listed first. I include names proposed as quadrinomials even though they are excluded by the Code, since in some cases later authors have made the name available through bibliographic reference (e.g., *A. justina maira* Orellana, 1996). I also discuss the spelling and status of Fruhstorfer names in the introduction to the Species accounts below. Two subspecies are undescribed due to their impending description by other authors. Note that all names are listed in alphabetical order in the Index.

Adelpha Hübner ([1819]: 42).
Type species by selection by Scudder (1875: 102): *Papilio mesentina* Cramer (1777: 102, pl. 162, figs. B, C).
=*Heterochroa* Boisduval (1836: pl. 8, fig. 4)
Type species by monotypy: *Heterochroa serpa* Boisduval (1836: pl. 8, fig. 4)
("-" denotes a subspecies, "--" a synonym and "---" an unavailable name)

bredowii Geyer, 1837
-*eulalia* (Doubleday, [1848])
--*guatemalensis* (Carpenter & Hobby, 1945) **syn. nov.**
-*californica* (Butler, 1865)
diocles Godman & Salvin, 1878
-*creton* Godman, 1901
herbita Weymer, 1907
zea (Hewitson, 1850)
--*serpentina* Fruhstorfer, 1915
--*tarpeia* Fruhstorfer, 1915
paroeca (Bates, 1864) **stat. rest.**
--*emathia* (R. Felder, 1869) **stat. rest.**
-*pseudodonysa* Salazar, 2000 **stat. nov.**
nea (Hewitson, 1847)
--*campeda* Fruhstorfer, 1915
-*sentia* Godman & Salvin, 1884 **stat. nov.**
paraena (Bates, 1865)
-*massilia* (C. Felder & R. Felder, 1867)
-*reyi* Neild, 1996
-*lecromi* Willmott, **ssp. nov.**
radiata Fruhstorfer, 1915
-*myrlea* Fruhstorfer, 1915
-*gilletella* Brévignon, 1995
-*aiellae* Willmott & Hall, 1999
-*explicator* Willmott & Hall, 1999
-*romeroi* Willmott & Neild, **ssp. nov.**
serpa (Boisduval, 1836)
--*damon* Fruhstorfer, 1913
--*ornamenta* Fruhstorfer, 1915
-*celerio* (Bates, 1864)
--*diademeta* Fruhstorfer, 1913
--*phintias* Fruhstorfer, 1913
-*duiliae* Fruhstorfer, 1913
-*diadochus* Fruhstorfer, 1915
--*timehri* Hall, 1938
--*florea* Brévignon, 1995
seriphia (C. Felder & R. Felder, 1867)
-*pione* Godman & Salvin, 1884
-*aquillia* Fruhstorfer, 1915
--*naryce* Fruhstorfer, 1915
-*therasia* Fruhstorfer, 1915
-*egregia* Röber, 1927 **stat. rest.**
-*godmani* Fruhstorfer, 1913
--*syrna* Steinhauser, 1974 **syn. nov.**
---*syrna* Fruhstorfer, 1915
-*barcanti* Willmott, **ssp. nov.**
hyas (Doyère, [1840])
-*viracocha* Hall, 1938
-*hewitsoni* Willmott & Hall, 1999
alala (Hewitson, 1847)
-*completa* Fruhstorfer, 1907
--*titia* Fruhstorfer, 1915
-*negra* (C. Felder & R. Felder, 1862)
--*ehrhardi* Neuburger, 1907 **syn. nov.**
--*albifida* Fruhstorfer, 1907 **syn. nov.**
--*cora* Fruhstorfer, 1907 **syn. nov.**
--*fillo* Fruhstorfer, 1907 **syn. nov.**
--*negrina* Fruhstorfer, 1913 **syn. nov.**
---*praecaria* Fruhstorfer, 1915
--*privigna* Fruhstorfer, 1915 **syn. nov.**
aricia (Hewitson, 1847)
-*serenita* Fruhstorfer, 1915 **stat. rest.**
-*portunus* Hall, 1938
corcyra (Hewitson, 1847)
-*aretina* Fruhstorfer, 1907
-*collina* (Hewitson, 1847) **stat. rest.**
--*epidamna* (C. Felder & R. Felder, 1867)
-*dognini* Willmott, **ssp. nov.**
-*salazari* Willmott, **ssp. nov.**
tracta (Butler, 1872)
pithys (Bates, 1864)
--*vodena* Fruhstorfer, 1915 **stat. nov.**
donysa (Hewitson, 1847)

--*roela* (Boisduval, 1870)
-*albifilum* Steinhauser, 1974 **stat. nov.**
fessonia (Hewitson, 1847)
-*lapitha* Hall, 1929 **stat. nov.**
-*cestus* (Hewitson, 1847)
-*ernestoi* Willmott, **ssp. nov.**
gelania (Godart, [1824])
-*arecosa* (Hewitson, 1847)
calliphane Fruhstorfer, 1915
poltius Hall, 1938
mythra (Godart, [1824])
--*zeba* (Hewitson, 1850)
basiloides (Bates, 1865)
--*lydia* (Butler, 1865) **stat. rest.**
--*lemnia* (C. Felder & R. Felder, 1867)
--*lativittata* Staudinger, 1886 **syn. nov.**
--*caelia* Fruhstorfer, 1915 **syn. nov.**
plesaure Hübner, 1823
--*heredia* Fruhstorfer, 1915
--*antoniae* Fruhstorfer, 1915
-*phliassa* (Godart, [1824])-
--*euboea* (C. Felder & R. Felder, 1867)
--*implicata* Fruhstorfer, 1915
--*bartolme* Fruhstorfer, 1915 **syn. nov.**
--*cerachates* Fruhstorfer, 1915
--*sirona* Fruhstorfer, 1915
-*pseudomalea* Hall, 1938
-*symona* Kaye, 1925
gavina Fruhstorfer, 1915
falcipennis Fruhstorfer, 1915
--*perga* Fruhstorfer, 1915 **stat. rest.**
thoasa (Hewitson, 1850)
--*silia* Fruhstorfer, 1913
--*cuyaba* Fruhstorfer, 1915
-*gerona* (Hewitson, 1867) **stat. rest.**
---*brevifascia* Talbot, 1928
-*calliphiclea* (Butler, [1870]) **stat. nov.**
-*manilia* Fruhstorfer, 1915
--*zalma* Fruhstorfer, 1915
thessalia (C. Felder & R. Felder, 1867)
-*indefecta* Fruhstorfer, 1913 **stat. nov.**
--*mincia* Hall, 1938 **syn. nov.**
-*cesilas* Fruhstorfer, 1915
--*ampla* Hayward, 1935 **syn. nov.**
iphiclus (Linnaeus, 1758)
--*basilea* (Cramer, 1777) **stat. rest.**
--*basilis* Hübner, [1819]
--*funalis* Fruhstorfer, 1915
--*exanima* Fruhstorfer, 1915
--*pharae* Fruhstorfer, 1915
-*ephesa* (Ménétriès, 1857)
--*gellia* Fruhstorfer, 1915
--*abylina* Fruhstorfer, 1915
-*estrecha* Willmott & Hall, 1999
iphicleola (Bates, 1864)
--*massilides* Fruhstorfer, 1915
-*iphimedia* Fruhstorfer, 1915
--*phera* Fruhstorfer, 1915
-*thessalita* Willmott & Hall, 1999
-*gortyna* Fruhstorfer, 1915
-*leucates* Fruhstorfer, 1915
--*daceleia* Fruhstorfer, 1915
abyla (Hewitson, 1850)
melona (Hewitson, 1847)
--*arete* (Ménétriès, 1857) **syn. nov.**
--*cibyra* Fruhstorfer, 1915 **stat. nov.**
-*leucocoma* Fruhstorfer, 1915 **stat. rest.**
--*meridionalis* Fruhstorfer, 1915 **syn. nov.**
--*biedermanni* Fruhstorfer, 1915 **syn. nov.**
--*nonsecta* Kaye, 1925 **syn. nov.**
-*pseudarete* Fruhstorfer, 1915 **stat. nov.**
-*deborah* Weeks, 1901 **stat. rest.**
-*neildi* Willmott, **ssp. nov.**
ethelda (Hewitson, 1867)
-*zalmona* (Hewitson, 1871) **stat. nov.**
-*sophax* Godman & Salvin, 1878 **stat. nov.**
-*eponina* Staudinger, 1886 **stat. nov.**
--*volupis* Fruhstorfer, 1915
-*galbao* Brévignon, 1995 **stat. nov.**
-ssp. nov.
epione (Godart, [1824])
-*agilla* Fruhstorfer, 1907
syma (Godart, [1824])
--*pravitas* Fruhstorfer, 1913 **syn. nov.**
cytherea (Linnaeus, 1758)
--*eleus* (Linnaeus, 1758) **stat. rest.**
--*lanilla* Fruhstorfer, 1913
-*aea* (C. Felder & R. Felder, 1867)
--*herennia* Fruhstorfer, 1915
-*daguana* Fruhstorfer, 1913
--*tarratia* Fruhstorfer, 1913 **syn. nov.**
--*despoliata* Fruhstorfer, 1915 **syn. nov.**
-*insularis* Fruhstorfer, 1913
-*marcia* Fruhstorfer, 1913
-*olbia* (C. Felder & R. Felder, 1867)
-*nahua* Grose-Smith, 1898
--*wernickei* Röber, 1923
viola Fruhstorfer, 1913 **stat. nov.**
-*pseudococala* Hall, 1933 **stat. nov.**
salmoneus (Butler, 1866)
-*emilia* Fruhstorfer, 1908
-*colada* (C. Felder & R. Felder, 1867)
-*salmonides* Hall, 1938
demialba (Butler, 1872)
epizygis Fruhstorfer, 1915
-*epona* Fruhstorfer, 1915
fabricia Fruhstorfer, 1913
--*hilareia* Fruhstorfer, 1915 **stat. nov.**
--*mamaea* Fruhstorfer, 1915 **syn. nov.**
capucinus (Walch, 1775)
--*juruana* Butler, 1877 **stat. nov.**
--*phylacides* Fruhstorfer, 1913 **stat. nov.**
--*georgias* Fruhstorfer, 1915 **stat. nov.**
-*velia* (C. Felder & R. Felder, 1867) **stat. nov.**
--*veliada* Fruhstorfer, 1915
-*gutierrezi* Neild, 1996 **stat. nov.**
barnesia Schaus, 1902
--*pseudomessana* Fruhstorfer, 1913 **syn. nov.**
-*leucas* Fruhstorfer, 1915 **stat. nov.**
--*paula* Bargmann, 1928 **syn. nov.**
-*trinita* Kaye, 1914 **stat. nov.**
diazi Beutelspacher, 1975
hesterbergi Willmott & Hall, 1999
abia (Hewitson, 1850)
--*rufilia* Fruhstorfer, 1915
naxia (C. Felder & R. Felder, 1867)
--*dominula* Möschler, 1877 **syn. nov.**
--*epiphicla* Godman & Salvin, 1884 **stat. nov.**
--*mucia* Fruhstorfer, 1915 **syn. nov.**
--*diatreta* Fruhstorfer, 1915
--*zynia* Fruhstorfer, 1915 **syn. nov.**
--*canuleia* Fruhstorfer, 1915 **syn. nov.**
-*hieronica* Fruhstorfer, 1913
-*oteroi* Neild, 1996
heraclea (C. Felder & R. Felder, 1867)
--*fugela* Hall, 1938 **syn. nov.**
---*fugela* Fruhstorfer, 1915
-*makkeda* (Hewitson, 1871)
-*antonii* Neild, 1996
atlantica Willmott, **sp. nov.**

malea (C. Felder & R. Felder, 1861)
-*ixia* (C. Felder & R. Felder, 1867) **stat. nov.**
--*himera* (C. Felder & R. Felder, 1867) **syn. nov.**
-*fundania* Fruhstorfer, 1915 **stat. nov.**
-*aethalia* (C. Felder & R. Felder, 1867)
--*davisii* (Butler, 1877) **syn. nov.**
--*metaxa* Fruhstorfer, 1913 **stat. nov.**
--*frusina* Fruhstorfer, 1913 **syn. nov.**
--*sarana* Fruhstorfer, 1913 **stat. nov.**
--*trinina* Kaye, 1914 **syn. nov.**
--*incomposita* Austin & Mielke, 1993 **syn. nov.**
-*goyama* Schaus, 1902 **stat. nov.**
--*leopardus* Fruhstorfer, 1913
boeotia (C. Felder & R. Felder, 1867)
--*fulica* Fruhstorfer, 1915 **syn. nov.**
-*oberthurii* (Boisduval, 1870)
--*jacquelinae* Steinhauser & Miller, 1977 **syn. nov.**
-*fidicula* Fruhstorfer, 1915
amazona Austin & Jasinski, 1999
ximena (C. Felder & R. Felder, 1862)
-*mossi* Hall, 1933
--*willmotti* Neild, 1996 **syn. nov.**
delinita Fruhstorfer, 1913
--*albina* Hall, 1938 **syn. nov.**
---*albina* Fruhstorfer, 1915
-*utina* Hall, 1938
--*escalantei* Steinhauser & Miller, 1977 **syn. nov.**
pollina Fruhstorfer, 1915
--*uta* Hall, 1938 **syn. nov.**
---*uta* Fruhstorfer, 1915
erotia (Hewitson, 1847)
--*lerna* (Hewitson, 1847) **stat. rest.**
--*aeolia* (C. Felder & R. Felder, 1867) **stat. rest.**
--*permagna* Fruhstorfer, 1913 **stat. rest.**
--*leonina* Fruhstorfer, 1913
--*archidona* Fruhstorfer, 1913
-*caphira* (Hewitson, 1869) **stat. rest.**
--*deleta* Fruhstorfer, 1913 **syn. nov.**
phylaca (Bates, 1866)
-*pseudaethalia* Hall, 1938
-*joffrei* Neild, 1996
messana (C. Felder & R. Felder, 1867)
--*aufidia* Fruhstorfer, 1915 **stat. nov.**
-*delphicola* Fruhstorfer, 1909 **stat. nov.**
thesprotia (C. Felder & R. Felder, 1867)
--*praetura* Fruhstorfer, 1913
--*nava* Fruhstorfer, 1913 **syn. nov.**
--*ophellas* Fruhstorfer, 1915 **syn. nov.**
--*zunilaces* Fruhstorfer, 1915 **syn. nov.**
mesentina (Cramer, 1777)
--*chancha* Staudinger, 1886 **syn. nov.**
lycorias (Godart, [1824])
--*isis* (Drury, 1782) preocc. (Drury, 1773)
--*divina* Fruhstorfer, 1907 **stat. nov.**
--*pseudagrias* Fruhstorfer, 1908 **syn. nov.**
-*wallisii* (Dewitz, 1877) **stat. nov.**
--*hypsenor* Godman & Salvin, 1879
--*fassli* Fruhstorfer, 1915 **syn. nov.**
-*lara* (Hewitson, 1850)
--*mainas* Fruhstorfer, 1915
-*melanthe* (Bates, 1864)
-*melanippe* Godman & Salvin, 1884 **stat. nov.**
-*spruceana* (Bates, 1864) **stat. nov.**
attica (C. Felder & R. Felder, 1867)
--*lesbia* Staudinger, 1886
--*oronoco* Weeks, 1906
--*carmela* Fruhstorfer , 1915
--*serita* Fruhstorfer, 1915
-*hemileuca* Willmott & Hall, 1999
leuceria (Druce, 1874)
-*juanna* Grose-Smith, 1898 **stat. nov.**
leucerioides Beutelspacher, 1975
erymanthis Godman & Salvin, 1884
-*adstricta* Fruhstorfer, 1915
-*esperanza* Balcázar & Willmott, 2002
-*fortunata* Willmott, **ssp. nov.**
sichaeus (Butler, 1866)
--*privata* Fruhstorfer, 1913
--*leucopetra* Fruhstorfer, 1913 **stat. nov.**
--*irisa* Fruhstorfer, 1913 **syn. nov.**
rothschildi Fruhstorfer, 1913
--*pallida* Röber, 1927
stilesiana DeVries & Chacón, 1982
boreas (Butler, 1866)
--*tizona* (C. Felder & R. Felder, 1867) **syn. nov.**
--*tizonides* Fruhstorfer, 1908 **stat. nov.**
--*verenda* Fruhstorfer, 1913
--*opheltes* Fruhstorfer, 1915 **syn. nov.**
-*kayei* Hall, 1939
cocala (Cramer, 1779)
--*urraca* (C. Felder & R. Felder, 1862)
--*saparua* Fruhstorfer, 1913
--*urracina* Fruhstorfer, 1913 **stat. nov.**
--*lorzina* Fruhstorfer, 1915 **syn. nov.**
-*caninia* Fruhstorfer, 1915
-*lorzae* (Boisduval, 1870)
--*cocalina* Fruhstorfer, 1913 **stat. nov.**
--*fufia* Fruhstorfer, 1913 **syn. nov.**
--*fufina* Fruhstorfer, 1915 **syn. nov.**
-*didia* Fruhstorfer, 1915 **stat. rest.**
---*chlide* d'Almeida, 1931
-*orellanae* Neild, 1996
felderi (Boisduval, 1870)
--*falcata* Godman & Salvin, 1878 **stat. rest.**
--*jarias* Fruhstorfer, 1915 **syn. nov.**
leucophthalma (Latreille, [1809])
--*mephistopheles* (Butler, 1869)
--*tegeata* Fruhstorfer, 1915
-*irminella* Strand, 1918 **stat. nov.**
--*iaere* Hall, 1929 **syn. nov.**
-*smalli* Willmott, **ssp. nov.**
irmina (Doubleday, [1848])
-*tumida* (Butler, 1873)
--*wilhelmina* Fruhstorfer, 1907
saundersii (Hewitson, 1867)
--*leutha* Fruhstorfer, 1915
-*helepecki* Weeks, 1901 **stat. rest.**
-*frontina* Hall, 1935
lamasi Willmott & Hall, 1999
salus Hall, 1935
-*emmeli* Willmott & Hall, 1999
-ssp. nov.
shuara Willmott & Hall, 1995
argentea Willmott & Hall, 1995
coryneta (Hewitson, 1874)
jordani Fruhstorfer, 1913
--*ernestina* Fruhstorfer, 1913 **syn. nov.**
zina (Hewitson, 1867)
--*restricta* Fruhstorfer, 1913
--*leucacantha* Fruhstorfer, 1915
--*manetho* Hall, 1938 **syn. nov.**
-*inachia* Staudinger, 1886
---*inachia* Fruhstorfer, 1915
-*lacina* (Butler, 1872)
-*irma* Fruhstorfer, 1907 **stat. nov.**
--*nadja* Fruhstorfer, 1907
--*nicetas* Hall, 1938 **syn. nov.**
-*enope* Hall, 1938 **stat. nov.**
-*desousae* Neild & Orellana, 1996 **stat. nov.**
-*pyrczi* Neild & Orellana, 1996 **stat. nov.**

milleri Beutelspacher, 1976
justina (C. Felder & R. Felder, 1861)
--*praevalida* Fruhstorfer, 1915
-*justinella* Fruhstorfer, 1907
-*valentina* Fruhstorfer, 1915 **stat. nov.**
-*maira* Orellana, 1996
---*maira* Fruhstorfer, 1915
-*inesae* Orellana, 1996
olynthia (C. Felder & R. Felder, 1867)
--*olynthina* Fruhstorfer, 1907 **syn. nov.**
--*levicula* Fruhstorfer, 1913 **syn. nov.**
--*olynthina* Fruhstorfer, 1915 **syn. nov.**
--*theaena* Fruhstorfer, 1915 **syn. nov.**
--*zopyra* Fruhstorfer, 1915 **stat. nov.**
levona Steinhauser & Miller, 1977

Species Identification

I suggest that the simplest way to identify *Adelpha* is through comparison of specimens with the plates and text accounts, with the aid of the pictorial keys for complex mimetic groups in Appendix B, but I recognise that some find a universal key to be a useful device. The purpose of this key is to allow the non-specialist to identify specimens without needing to resort to dissection or examination of microscopic structures, or analysis of wing pattern element homologies, which requires some experience with the genus. I have therefore *not* necessarily used the terminology of Fig. 3 for wing patterns, but I have used more widespread wing pattern terminology, such as the term "postdiscal band" to refer to the entire band through the middle of the wing, rather than just the portion homologous to the element shown on Fig. 3. I have also given references for certain couplets to figures in Appendix B that illustrate the different character states being referred to, using italics with the terminology "*(B1-2)*" to indicate, for example, that the relevant figure is in Appendix B1 and is Box 2 (boxes are numbered at lower left corner). The key is not arranged strictly phylogenetically and in most cases the characters employed are not considered to be those that define the species; indeed, a number of species have been keyed out more than once due to differences in the most obvious wing pattern characters. I discuss the characters that I consider to define species in the Species Accounts below, and the key is to be used in conjunction with the plates, Appendix B, the ranges and further identifying characters given in the accounts for each taxon. I have, in some cases, listed additional characters to confirm identification, but those given first are the most reliable. It should be noted that, in terms of variation, "usually" refers to variation between subspecies, and "typically" refers to variation within a single taxon.

The ventral surface wing pattern is the key to identifying *Adelpha* species. In fact, I believe that the historical notoriety that the genus has gained, in terms of the difficulties in species identification, may largely stem from the simple fact that in most collections specimens are habitually prepared with the dorsal side uppermost. This common practice nevertheless often seems to be the only possible explanation to account for the failure of most earlier taxonomists to appreciate the consistent ventral surface differences between many *Adelpha* species. While the dorsal patterns of many species do provide characters that readily enable identification, with considerable practice, the ventral surface provides a more rapid and reliable means. Special attention should be paid to the pattern in the VFW discal cell and the exact arrangement of the postdiscal band, and postdiscal and submarginal series on the ventral surface. Particularly important is the fusion or separation of both postdiscal series, and whether or not they are fused with or separate from the postdiscal band on the VFW, especially in cells Cu$_2$-Cu$_1$, Cu$_1$-M$_3$ and M$_3$-M$_2$. The pattern of postdiscal and submarginal series on the VHW is also of great value in identification.

Key to all species of the genus

1. DHW with white or orange markings in postdiscal area 2
DHW entirely brown in postdiscal area (orange tornal spot may be present) 87

2(1). VFW with pale distal half of discal cell, between dark cell band and discocellular band, divided into three (usually) by basally pointing, "V"-shaped black line (line may not quite touch basal red-orange band, in which case it divides area into two, a basal, hourglass shape and distal, much smaller triangle); very base of VHW discal cell always entirely white; dark streak absent in base of VFW discal cell *(B1-1)* 3
VFW with pale distal half of discal cell divided into two by a straight, vertical central dark line, a horizontal dark line, or undivided; very base of VHW discal cell entirely white or with a dark line or darker shading; dark streak almost always present in base of VFW discal cell *(B1-1)* 14

3(2). VHW with orange/yellow postdiscal line distal of white postdiscal band extending from tornal orange/yellow spot in cell 2A-Cu$_2$ to costa; basal edge of white postdiscal band usually bordered by a red-orange band in most taxa; continuous black line from costa to vein 3A through discal cell usually present ... 4
VHW with postdiscal area distal of white postdiscal band lacking orange/yellow band, with isolated orange tornal spot in cell 2A-Cu$_2$; basal edge of white postdiscal band not bordered by a red-orange band; no continuous black line from costa to vein 3A through discal cell .... ***herbita***

4(3). VHW with basal portion of vein 3A white, distal portion lined with black which continues as a continuous dark line to costa 5
VHW with vein 3A entirely black to wing base, not part of a line crossing discal cell .... ***zea***

5(4). VFW with undivided whitish submarginal dashes in each cell except 2A-Cu$_2$, particularly clear in cells Cu$_2$-Cu$_1$ and M$_2$-M$_1$ *(B2-7)* 6
VFW with whitish submarginal dashes divided into two in each cell, particularly clear in cells Cu$_2$-Cu$_1$ and M$_2$-M$_1$ *(B2-7)* 8

6(5). VFW with distal edges of silvery-white postdiscal blocks in cell Cu$_2$-Cu$_1$ and 2A-Cu$_2$ aligned; VFW costa whitish immediately distal of postcellular bar *(B2-8)* . 7
VFW with distal edge of silvery-white postdiscal block in cell Cu$_2$-Cu$_1$ much more distal than that in cell 2A-Cu$_2$; VFW costa brown immediately distal of postcellular bar *(B2-8)* .... ***nea***

7(6). DFW with both orange and white postdiscal spots in cell Cu$_1$-M$_3$; VHW with red-orange band distal of white postdiscal band slightly concave from vein M$_2$ to costa .... ***paroeca***
DFW with either an orange or a white postdiscal spot in cell Cu$_1$-M$_3$, but not both; VHW with red-orange band distal of white postdiscal band smoothly convex throughout wing .... ***paraena***

8(5). DFW orange postdiscal marking absent in cells M$_2$-M$_1$ and M$_1$-R$_5$....... .... ***seriphia***
DFW orange postdiscal marking present in cells M$_2$-M$_1$ and M$_1$-R$_5$ 9

9(8). VFW pale orange postdiscal marking in cells M$_3$-R$_5$, and/or pale silver-grey to brownish shading in cell Cu$_1$-M$_3$ just distal of white postdiscal spot, with clear, dark lines parallel to veins intruding distally at least half way into pale marking and/or to edge of white postdiscal spot (in cell Cu$_1$-M$_3$) 10

VFW with both pale orange postdiscal marking and pale colouring in cell Cu$_1$-M$_3$ distal of white postdiscal spot with no dark lines parallel to veins intruding distally, or these only enter a short way, or entire marking is dark orange and darker lines cannot be seen clearly 11

10(11). VFW costa pale yellowish or whitish at base; pale markings distal of red-orange postdiscal band on VHW parallel to band *(B2-9)* .... ***hyas***

VFW costa red-orange at base, at least along distal edge of costal vein; pale markings distal of red-orange postdiscal band on VHW noticeably closer to band in cells M$_1$-Rs and Rs-Sc+R$_1$ than in cells M$_3$-M$_2$ and M$_2$-M$_1$ *(B2-9)* .... ***seriphia***

11(9). DFW with white postdiscal marking in cell Cu$_1$-M$_3$ well developed, always at least half width of marking in cell Cu$_2$-Cu$_1$ 12

DFW with white postdiscal marking in cell Cu$_1$-M$_3$ absent or a tiny dot, much reduced compared to size of marking in cell Cu$_2$-Cu$_1$ .... ***radiata***

12(11). VHW with two rows of whitish submarginal markings separated by a sharply defined dark brown line; whitish markings may or may not be divided in two in each cell by a dark brown line parallel to the veins ... 13

VHW with two rows of whitish submarginal markings almost merged, separated only by a faint, poorly defined darker line; whitish markings clearly divided in two in each cell by a dark brown line parallel to the veins .... ***radiata***

13(12). DFW with orange subapical marking vertically orientated, more tall than wide; white postdiscal spots in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ strongly diagonally displaced; VHW with white submarginal markings much nearer to orange postdiscal band in cells M$_1$-Rs and Rs-Sc+R$_1$ than in cells Cu$_1$-M$_1$; Central America and Andes *(B2-9)* .... ***seriphia***

DFW with orange subapical marking horizontally orientated, more wide than tall; white postdiscal spots in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ usually not strongly diagonally displaced; VHW with white submarginal markings approximately parallel to orange postdiscal band throughout wing; Central and South America to southeastern Brazil, Paraguay *(B2-9)* .... ***serpa***

14(2). DFW with continuous, even white postdiscal band from costa to anal margin, unbroken by dark veins *(B2-1)* .... ***fessonia***

DFW postdiscal band variable in extent and colour, but never white and unbroken from costa to anal margin, and may be entirely absent *(B2-1)* 15

15(14). VFW discal cell with pale area between red-orange cell bands divided in two by a vertical, clearly defined red-brown to black line *(B1-1)* 16

VFW discal cell with pale area between red-orange cell bands undivided or (very rarely) with an indistinct, poorly defined darker central vertical line which obliterates most of the pale area *(B1-1)* 24

16(15). DFW discal cell with red scaling at base and between cell bars 1 and 2 17

DFW discal cell entirely dark brown or with some scattered orange-brown scaling 18

17(16). DFW with a large subapical orange marking .. ***bredowii***

DFW lacking orange markings .... ***gelania***

18(16). DFW with postdiscal band in cell 2A-Cu$_2$ entirely, or at least in basal half, white 19

DFW with postdiscal band entirely orange in cell 2A-Cu$_2$ .... ***viola***

19(18). DFW with area between postdiscal band in cell Cu$_1$-M$_3$ and costa dark brown, or with indistinct, whitish shading, or entirely orange 20

DFW with area between postdiscal band in cell Cu$_1$-M$_3$ and costa dark brown with two well defined white ovals in cells M$_2$-M$_1$ and M$_1$-R$_5$ .... ***alala***

20(19). DFW with usually relatively narrow orange postdiscal band which remains isolated from more posterior white postdiscal band 21

DFW with very broad orange postdiscal band of which basal edge merges smoothly with basal edge of more posterior white postdiscal band .... ***cytherea***

21(20). VHW with silvery submarginal line and distal edge in cells Cu$_1$-Rs approximately straight, with a uniform red-brown border lacking white marginal scaling in the middle of each cell; Andes 22

VHW with silvery submarginal line and distal edge in cells Cu$_1$-Rs distinctly scalloped, with sparse white marginal scaling in the middle of each cell; Central America 23

22(21). VFW with pale subapical marking in cells M$_3$-R$_5$ composed of basally pointing, “V”-shaped dashes; basal edge of marking in cells M$_3$-R$_5$ slightly convex; Andes from extreme N. Peru-Venezuela .... ***corcyra***

VFW with pale subapical marking in cells M$_3$-R$_5$ composed of straight dashes; basal edge of marking in cells M$_3$-R$_5$ straight; Andes from extreme northern Peru-Bolivia .... ***aricia***

23(21). DFW with orange subapical marking approximately equal in width to white postdiscal band; VHW discal cell with ground colour entirely whitish grey; VFW with red-brown line entirely surrounded by whitish grey scaling between distal edge of white postdiscal band and costa; base of cell Cu$_2$-Cu$_1$ with whitish grey scaling; hindwing always slightly produced at tornus .... ***pithys***

DFW with orange subapical marking broader than white postdiscal band; VHW discal cell with ground colour reddish brown between cell bars 1 and 2, and 3 and postcellular; VFW with red-brown line between distal edge of white postdiscal band and costa usually lacking whitish grey scaling between it pale yellow subapical marking; base of cell Cu$_2$-Cu$_1$ reddish brown; hindwing usually rounded at tornus ...... ***donysa***

24(15). DFW lacking red scaling in discal cell and at discocellulars 25

DFW with red band crossing middle of discal cell and over discocellulars .... ***diocles***

25(24). DFW with postdiscal band present and completely white to vein M$_3$, spot in cell Cu$_2$-Cu$_1$ well developed 26

DFW with some orange scaling in postdiscal band between anal margin and vein M$_3$, or band is absent in cell Cu$_2$-Cu$_1$ (a tiny, isolated whitish brown dot may be present at base of cell Cu$_2$-Cu$_1$), or DFW entirely dark brown 46

26(25). DHW with orange tornal spot present 27

DHW with orange tornal spot absent 44

27(26). DFW with a large orange subapical marking, lacking additional well developed orange subapical spots distally (tiny dots may be present near distal edge in cells M$_2$-M$_1$ and M$_1$-R$_5$) 28

DFW with two well developed orange subapical spots in cells M$_1$-R$_5$ and R$_5$-R$_4$ separated from a more basal, much larger orange marking by an area of dark brown at least as wide as the more basal marking .... ***naxia***

28(27). VFW with uneven, indistinct, pale orange, silver-grey and/or reddish brown markings in postdiscal area, not forming well defined straight stripes 29

VFW with a pair of well defined, straight, vertical postdiscal stripes between cells Cu$_2$-R$_5$, a basal white stripe and a distal orange stripe, bordered distally and basally by black .... ***syma***

29(28). DFW with orange subapical marking not touching white postdiscal marking in cell Cu$_1$-M$_3$ 30
DFW with orange subapical marking touching distal edge of white postdiscal marking in cell Cu$_1$-M$_3$....... 45

30(29). DFW with white postdiscal band terminating at vein M$_3$ *(B2-1)*.. 31
DFW with white postdiscal band extending fully to vein M$_2$, sometimes as dashes in cells M$_2$-M$_1$ and M$_1$-R$_5$ *(B2-1)*... ***basiloides***

31(30). VFW with area immediately distal of discocellular veins orange to reddish brown, then dark brown line (postcellular bar), then silver-grey 32
VFW with area immediately distal of discocellular veins orange, then very faint slightly darker line (postcellular bar), then orange.......................... ***mythra***

32(31). VFW with white postdiscal band continuing to costa as greyish white band anterior of vein M$_3$, distal edge of which is aligned with distal edge of white postdiscal band in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ *(B3-2)* 33
VFW with white postdiscal band broken in cell M$_3$-M$_2$; if there is whitish shading in cell M$_3$-M$_2$, distal edge is not aligned with distal edge of white postdiscal band in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ *(B3-2)* 34

33(32). VHW white postdiscal band immediately bordered distally by very thin dark brown line, then red-brown band as broad as white postdiscal band, then one to two indistinct silver-grey lines .... ***poltius***
VHW white postdiscal band immediately bordered distally by thin red-brown band, then thin silver-grey line, then red-brown, then two silver-grey lines .... ***calliphane***

34(32). VFW with orange-brown to red-brown discal cell bands parallel; basal area of cell M$_3$-M$_2$ mostly filled with silver-grey scaling or with a well defined silver-grey triangle; VHW discal cell bands separate and at least as far apart as width of cell bands *(B3-3)*.......... 35
VFW with orange-brown discal cell bands converging posteriorly; basal area of cell M$_3$-M$_2$ dark brown or reddish brown, or with faint, poorly defined paler grey scaling in anterior half only; VHW discal cell bands merged into a single band or nearly so *(B3-3)*.... ***thoasa***

35(34). Ventral surface marginal border of both wings almost entirely orange-brown or red-brown, with very faint white dashes only in cell 2A-Cu$_2$ and trace in cell Cu$_2$-Cu$_1$ 36
Ventral surface marginal border of both wings orange-brown or red-brown with clear white dashes in most cells 37

36(35). VHW with elongate tornus, so that basal pair of black tornal spots are nearer distal margin than white postdiscal band in cell 2A-Cu$_2$; white postdiscal band in cells M$_1$-Rs and Rs-Sc+R$_1$ bordered distally by thin dark brown line then paler yellowish brown line .... ***falcipennis***
VHW without elongate tornus, basal pair of black tornal spots are equidistant between distal margin and white postdiscal band in cell 2A-Cu$_2$; white postdiscal band in cells M$_1$-Rs and Rs-Sc+R$_1$ bordered distally by thin red-brown line then thicker silver-grey line ***gavina***

37(35). VFW with pale orange subapical marking in cells M$_3$-M$_2$ and M$_2$-M$_1$ not split by continuous line of darker red-brown scaling near distal edge, marking split only in cell M$_3$-M$_2$ *(B2-4)*; DFW orange subapical marking may only just extend into cell M$_3$-M$_2$, extend to terminate broadly at vein M$_3$, or extend (rarely) as orange dashes into cell Cu$_2$-Cu$_1$................................ 38
VFW with pale orange subapical marking in cells M$_3$-M$_2$ and M$_2$-M$_1$ split by continuous line of darker red-brown scaling near distal edge *(B2-4)*; DFW orange subapical marking always extends broadly posteriorly at least as far as vein M$_3$, often broadly into cell Cu$_2$-Cu$_1$ .... ***thessalia***

38(37). Hindwing margin not produced into a short “tail” at vein Cu$_1$; DHW distal half dark brown with slightly paler brown submarginal lines; DFW orange subapical marking does not extend distally to reach inner paler brown submarginal line in cell M$_2$-M$_1$; not Jamaica.. 39
Hindwing margin produced into a short “tail” at vein Cu$_1$; DHW with thin whitish submarginal line; DFW orange subapical marking extends distally to reach inner paler brown submarginal line in cell M$_2$-M$_1$; Jamaica.. ***abyla***

39(38). DFW orange subapical marking extending to broadly border vein M$_3$, or extending into cell M$_2$-M$_1$ as a triangle of varying size with basal edge of marking straight or smoothly concave *(B2-5)* 40
DFW orange subapical marking much broader in cell M$_2$-M$_1$ than M$_3$-M$_2$, extending into cell M$_3$-M$_2$ only at distal edge as a triangular, posteriorly pointing dash, basal edge of marking not straight but kinked at vein M$_2$ *(B2-5)*.. ***iphiclus***

40(39). DFW white postdiscal band tapering slightly from anal margin to cell Cu$_1$-M$_3$; base of eastern Andes S. Colombia-Peru .... ***iphicleola***
DFW white postdiscal band not tapering from anal margin to cell Cu$_1$-M$_3$; not base of eastern Andes S. Colombia-Peru 41

41(40). DFW orange subapical marking broadly bordering vein M$_3$ 42
DFW orange subapical marking extending into cell M$_3$-M$_2$ only as a small triangle, often touching but not broadly bordering vein M$_3$.. 43

42(41). DFW with distal edge of orange subapical marking in each of cells M$_3$-R$_5$ slightly concave in some or all cells; white postdiscal band of approximately equal width to orange subapical marking; VFW with edges of pale orange subapical marking sharply defined, particularly basal edge, with red-brown scaling closely confined to veins Cu$_2$ and M$_1$; VHW with first pale greyish line distal of white postdiscal band brighter whitish at vein M$_3$ and closer to second distal pale greyish line *(B2-5)* .... ***iphicleola***
DFW with distal edge of orange subapical marking in each of cells M$_3$-R$_5$ straight or slightly convex*)*; white postdiscal band approximately half width of orange subapical marking; VFW with edges of pale orange subapical marking poorly defined, typically with diffuse red-brown scaling, with red-brown scaling broadly along veins Cu$_2$ and M$_1$; VHW with first pale greyish line distal of white postdiscal band of uniform colour and roughly parallel to second distal pale greyish line in cells Cu$_2$-M$_2$ *(B2-5)*.................. ***iphiclus***

43(41). DFW with distal edge of orange subapical marking from vein M$_1$ to costa slightly concave; VFW with edges of pale orange subapical marking sharply defined, particularly basal edge, with red-brown scaling closely confined to veins Cu$_2$ and M$_1$; VHW with first pale greyish line distal of white postdiscal band brighter whitish at vein M$_3$ and closer to second distal pale greyish line *(B2-5)* .... ***iphicleola***
DFW with distal edge of orange subapical marking from vein M$_1$ to costa straight or slightly convex; VFW with edges of pale orange subapical marking poorly defined, typically with diffuse red-brown scaling, with red-brown scaling broadly along veins Cu$_2$ and M$_1$; VHW with first pale greyish line distal of white postdiscal band of uniform colour and roughly parallel to second distal pale greyish line in cells Cu$_2$-M$_2$ *(B2-5)*.. ***iphiclus***

44(26). DFW with orange subapical marking broadest in cells

M_2-M_1 and M_1-R_5, tapering to a point in cell Cu_2-Cu_1 .... ***coryneta***
DFW with orange subapical marking broadest in cell M_3-M_2, absent or present as indistinct orange scaling in cell Cu_1-M_3........ ***felderi***

45(29). DFW orange subapical marking extending right across cell M_2-M_1 to broadly end at costa; dark red-brown line cutting pale VFW orange subapical marking in half is even in width .... ***abia***
DFW with only basal half of orange subapical marking ending at costa, distal half ending mid cell M_2-M_1; dark red-brown line cutting pale VFW orange subapical marking in half is much broader in cell M_2-M_1 than M_3-M_2 .... ***epizygis***

46(25). DFW with some orange or white markings........ 47
DFW entirely dark brown........ ***justina***

47(46). DHW with either white or partially white hindwing postdiscal markings, or if entirely orange, isolated subapical spots are present on DFW........ 48
DHW with continuous, uniformly orange postdiscal band which extends from tornus to costa, then across DFW to costa, DFW subapical spots absent........ ***ethelda***

48(47). DFW with postdiscal band in cells 2A-Cu_2 to Cu_1-M_3 vertical, or, if inclined, orange subapical spots are present at least in cells M_1-R_5 and R_5-R_4 or DHW is entirely brown 49
DFW with oblique orange band from tornus to costa, orange subapical spots entirely absent, DHW with central white spot........ ***leucophthalma***

49(48). VFW discal cell silvery grey or whitish with clear brown to black basal streak, cell bars one and two distinct and separated by reddish to orange-brown bar, a pale band between second and third cell bars *(B1-1)* 50
VFW discal cell silvery grey with basal streak absent or very faint black scaling, cell bars one and two coalesced to form a black band, a round silver-grey spot in anterior half of cell between second and third cell bars *(B1-1)* .... ***argentea***

50(49). DHW postdiscal band or markings either partially or totally white........ 51
DHW postdiscal band uniformly orange........ 69

51(50). DFW with orange subapical spot in cell R_5-R_4, and/or two sets of orange postdiscal to subapical markings in either or both of cells M_2-M_1 and M_1-R_5 52
DFW with no orange subapical spot in cell R_5-R_4, and only one orange postdiscal to subapical marking in cells M_2-M_1 and M_1-R_5........ 71

52(51). VHW with white postdiscal band bordered basally by reddish or orange-brown line, then whitish or grey in discal cell, then similarly coloured reddish or orange-brown line........ 53
VHW with white postdiscal band bordered basally by continuous black/dark brown line, then continuous orange band, both extending from near tornus to at least vein Sc+R_1........ 73

53(52). DFW with postdiscal band variably orange and white to vein Cu_1, joined to postdiscal and subapical orange markings........ 54
DFW with postdiscal band white to vein Cu_1, isolated from postdiscal and subapical orange markings........ 74

54(53). VFW with inclined or vertical postdiscal band, if the latter, band is completely or in its basal half very pale orange, not dissimilar in colour from white VHW postdiscal band........ 55
VFW with vertical, matt orange postdiscal band, distinctly different in colour from VHW postdiscal band........ ***cocala***

55(54). VFW postdiscal band inclined or vertical, if the latter, very pale orange, similar in colour to white VHW postdiscal band, with darker vertical red-brown lines variably present; silver-grey submarginal markings not particularly pronounced in cells M_2-M_1 and M_1-R_5, silver-grey apical markings typically present in cells R_5-R_4 and R_4-R_3........ 56
VFW postdiscal band vertical, distinctly two-tone, with basal half very pale orange, similar in colour to white VHW postdiscal band, distal half entirely orange-brown *(B1-3)*; two prominent, bright whitish subapical spots in cells M_2-M_1 and M_1-R_5, no pale apical spots in cells R_5-R_4 and R_4-R_3........ ***cocala***

56(55). DFW with postdiscal band always reaching anal margin, basal edge of postdiscal band in cells 2A-Cu_2 and Cu_2-Cu_1 perpendicular to anal margin........ 57
DFW with postdiscal band usually not reaching anal margin, basal edge of postdiscal band in cells 2A-Cu_2 and Cu_2-Cu_1 inclined to anal margin........ 78

57(56). VFW with anterior dash of inner submarginal pair of silver-grey dashes in cell 2A-Cu_2 of approximately equal length or slightly longer than posterior dash........ 58
VFW with anterior dash of inner submarginal pair of silver-grey dashes in cell 2A-Cu_2 of approximately twice length of posterior dash; silver-grey marginal dashes absent except in cell 2A-Cu_2; ventral colours predominantly red-brown and grey-silver........ 79

58(57). VFW with very pale orange postdiscal markings in cells Cu_2-Cu_1 and Cu_1-M_3 of equal or differing widths, split by dark lines, either distinct or diffuse, each marking followed distally by one to two silver-grey dashes; basal edge of pale postdiscal marking in cell 2A-Cu_2 perpendicular to anal margin; pale silver-grey marginal dashes/spots present in cell 2A-Cu_2 *(B1-3)* 59
VFW with very pale orange postdiscal markings in cells Cu_2-Cu_1 and Cu_1-M_3 of equal widths, not split by dark lines, each marking followed distally by only a single silver-grey dash; basal edge of pale postdiscal marking in cell 2A-Cu_2 inclined to anal margin; pale silver-grey marginal dashes/spots absent in cell 2A-Cu_2 *(B1-3)*........ 80

59(58). VHW distal of white postdiscal band not: entirely red-brown except for row of close, paired silver dashes from costa to tornus, basally indented in cell M_3-M_2; DFW with orange subapical spot in cell M_2-M_1 absent to pronounced; postdiscal band in cell 2A-Cu_2 white or orange, same thickness or narrower than band in cell Cu_2-Cu_1........ 60
VHW distal of white postdiscal band entirely red-brown except for row of close, paired silver dashes from costa to tornus, basally indented in cell M_3-M_2, and two white tornal dashes in cell 2A-Cu_2; DFW with orange subapical spot in cell M_2-M_1 absent or very faint orange scales; postdiscal band in cell 2A-Cu_2 white and half thickness of band in cell Cu_2-Cu_1........ ***milleri***

60(59). DFW with distal edge of postdiscal band in cell Cu_2-Cu_1 straight or slightly convex; VFW with pale postdiscal band usually distally displaced from postcellular bar, very rarely almost touching postcellular bar, in cell M_2-M_1; pale postdiscal markings in cells Cu_2-Cu_1 and Cu_1-M_3 may or may not be split by vertical, straight, dark red-brown scaling *(B1-3)* 61
DFW with distal edge of postdiscal band in cell Cu_2-Cu_1 concave; VFW with pale postdiscal band almost touching postcellular bar in cell M_2-M_1; pale postdiscal markings in cells Cu_2-Cu_1 and Cu_1-M_3 split by vertical, straight, dark red-brown scaling *(B1-3)*........ ***ximena***

61(60). DFW with distal edge of orange subapical spot in cell M_2-M_1 distally displaced with respect to distal edge of orange postdiscal band in cell M_3-M_2 (or spot absent), spot clearly isolated from band *(B1-7)*; VFW with two long pale dashes, extending across cell, or single round spot, in cell Cu$_2$-Cu$_1$ distal of pale postdiscal block 62

DFW with distal edge of orange subapical spot in cell M$_2$-M$_1$ aligned with distal edge of orange postdiscal band in cell M$_3$-M$_2$, spot fused or nearly so (vein M$_3$ dark brown) with band *(B1-7)*; VFW with two short pale dashes, not extending across cell, in cell Cu$_2$-Cu$_1$ distal of pale postdiscal block .... ***capucinus***

62(61). VFW with pale postdiscal band either split by an even line, which cuts right through band and ends at distal edge of band at vein Cu$_2$, variably split, or not split *(B1-3)* 63

VFW with pale postdiscal band split by posteriorly narrowing line, starting in cell M$_3$-M$_2$ and terminating within marking in cell Cu$_2$-Cu$_1$ *(B1-3)*............ ***amazona***

63(62). VFW pale postdiscal band not completely divided in two by a red-brown line, or line is slightly concave; DFW orange subapical spot in cell M$_2$-M$_1$ absent, smaller than, or of equivalent size to that in cell M$_1$-R$_5$; VFW pale subapical spot in cell M$_2$-M$_1$ not divided with darker red-brown scaling; VHW with pale, thin silver-grey line distal of white postdiscal band even throughout or much thicker whitish scaling in cells M$_1$-Rs and Rs-Sc+R$_1$ 64

VFW pale postdiscal band divided in two by distinct, vertical, straight red-brown line; DFW orange subapical spot in cell M$_2$-M$_1$ pronounced and as large as that in cell M$_1$-R$_5$ or larger; VFW pale, subapical spot in cell M$_2$-M$_1$ typically divided with darker red-brown scaling; VHW with pale, thin silver-grey line distal of white postdiscal band even throughout .... ***boeotia***

64(63). VFW with straight silver-grey submarginal dash in cell Cu$_1$-M$_3$ or marking absent; VHW with paler lines and darker bands of variable colour and width distal to white postdiscal band, all approximately parallel and evenly spaced; DHW with tornal orange spot of varying size in cell 2A-Cu$_2$ typically present 65

VFW with basally pointing, "V"-shaped silver-grey submarginal marking in cell Cu$_1$-M$_3$; VHW with thin silver-grey line distal to white postdiscal band, then dark red band constricted in cell M$_3$-M$_2$, then line of close, paired silver-grey dashes basally displaced in cell M$_3$-M$_2$, then marginal silver-grey dashes; DHW with tornal orange spot in cell 2A-Cu$_2$ absent ...***jordani***

65(64). VFW with pale postdiscal marking in cell Cu$_2$-Cu$_1$ divided into a basal block and two distal dashes....... 66

VFW with pale postdiscal marking in cell Cu$_2$-Cu$_1$ divided into a basal block and one round distal spot. 81

66(65). VHW with first two pale grey lines distal of white postdiscal band separate throughout wing *(B1-4)* 67

VHW with first two pale grey lines distal of white postdiscal band fused to form a single large whitish spot in cell Rs-Sc+R$_1$ *(B1-4)* .... ***pollina***

67(66). VHW with first pale line distal of white postdiscal band of even width and colour throughout wing *(B1-4)* 68

VHW with first pale line distal of white postdiscal band much thicker in cells M$_1$-Rs and Rs-Sc+R$_1$ than in remainder of wing *(B1-4)*..................................... 86

68(67). VFW with submarginal silver-grey dashes of approximately even size in each cell, forming a line parallel to distal margin *(B1-8)* .... ***malea***

VFW with submarginal silver-grey dashes of varying size, that in cell Cu$_1$-M$_3$ absent or much reduced compared with that in cell Cu$_2$-Cu$_1$, and basally displaced with respect to remaining dashes *(B1-8)* .... ***fabricia***

69(50). VFW with line of silver-grey submarginal dashes notably basally displaced in cells Cu$_2$-Cu$_1$, Cu$_1$-M$_3$ and M$_3$-M$_2$, most displaced in M$_3$-M$_2$; west of Andes 70

VFW with submarginal silver-grey dashes forming a line parallel to distal margin; eastern Mérida range in Venezuela.. ***malea***

70(69). Hindwing elongate and triangular; VHW with second pale line distal of white postdiscal band almost uniform in colour, sometimes slightly paler in cells M$_1$-Rs and Rs-Sc+R$_1$; DFW with basal edge of orange postdiscal band continuously curving through vein M$_3$ .... ***leuceria***

Hindwing squarish; VHW with second pale line distal of white postdiscal band consisting of large, silvery, scalloped spots in cells M$_1$-Rs and Rs-Sc+R$_1$ and much thinner and paler throughout remainder of wing; DFW with basal edge of orange postdiscal band displaced at vein M$_3$ .... ***leucerioides***

71(51). DFW orange postdiscal band with distal edge more distal in cell M$_3$-M$_2$ than in cell M$_2$-M$_1$...................... 72

DFW orange postdiscal band with distal edge more distal in cell M$_2$-M$_1$ than in cell M$_3$-M$_2$............ ***plesaure***

72(71). VFW postdiscal band matt orange-brown; VFW distal ground colour reddish brown; pronounced silver white subapical spots in cells M$_2$-M$_1$ and M$_1$-R$_5$, former larger, apical spots absent in cells R$_5$-R$_4$ and R$_4$-R$_3$ .... ***cocala***

VFW postdiscal band white or very pale orange; VFW distal ground colour dark brown; silver white subapical spots in cells M$_2$-M$_1$ and M$_1$-R$_5$, former sometimes smaller and often absent, apical spots present in cells R$_5$-R$_4$ and R$_4$-R$_3$......................... ***melona***

73(52). DHW with postdiscal band entirely white; VFW with pale postdiscal markings in cells Cu$_1$-M$_3$ and M$_3$-M$_2$ split in two by vertical orange-brown line..........***shuara***

DHW with postdiscal band orange, or tinged with orange, particularly at distal edge, in cells M$_1$-Rs and Rs-Sc+R$_1$; VFW with undivided pale postdiscal marking in cell Cu$_1$-M$_3$, that in M$_3$-M$_2$ occasionally with very faint darker brown scaling through middle ... . ***attica***

74(53). VFW with single pale yellowish white spot between white postdiscal block in cell Cu$_2$-Cu$_1$ and inner, thick silver-grey submarginal dash *(B1-3)* 75

VFW with two pale dashes between white postdiscal block in cell Cu$_2$-Cu$_1$ and inner, thick silver-grey submarginal dash *(B1-3)* 76

75(74). VHW with spots of first row of pale whitish grey markings distal of white postdiscal band largest in cells M$_2$-M$_1$ and M$_1$-Rs....... ....***erotia***

VHW with spots of first row of pale whitish grey markings distal of white postdiscal band even dashes in all cells, or slightly larger in cells M$_1$-Rs and Rs-Sc+R$_1$... ***messana***

76(74). DFW with orange subapical spot in cell M$_3$-M$_2$ larger than or equivalent in size to that in cell M$_2$-M$_1$; distal edge of orange subapical spot in cell M$_2$-M$_1$ aligned with distal edge of orange postdiscal band in cell M$_3$-M$_2$, spot fused or nearly so (vein M$_3$ may be dark brown) with band *(B1-7)*; VFW with silver submarginal marking in cell Cu$_1$-M$_3$ absent or basally displaced with respect to remaining line of submarginal markings 77

DFW with orange subapical spot in cell M$_3$-M$_2$ absent or much smaller than that in cell M$_2$-M$_1$; if present, orange subapical spot in cell M$_2$-M$_1$ isolated from orange postdiscal band in cell M$_3$-M$_2$ *(B1-7)*; VFW with silver submarginal markings forming a row parallel to distal margin..................................... ***malea***

77(76). DFW with orange subapical spot in cell R$_5$-R$_4$ present;

VFW with silver-grey submarginal marking in cell Cu$_1$-M$_3$ present; forewing with cell Cu$_1$-M$_3$ of approximately even width throughout, may be very slightly wider at base than at distal margin ..... ***barnesia***

DFW with orange subapical spot in cell R$_5$-R$_4$ absent; VFW with silver-grey submarginal marking in cell Cu$_1$-M$_3$ absent; forewing with cell Cu$_1$-M$_3$ noticeably wider near base than at distal margin .... ***diazi***

78(56). VFW with distal edge of pale orange postdiscal band nearer distal margin in cell 2A-Cu$_2$ than in cell Cu$_2$-Cu$_1$; VHW with each dash of most distal submarginal row of silver-grey dashes bordered basally by dark grey then another silver-grey dash.......................... ***zina***

VFW with distal edge of pale orange postdiscal band nearer distal margin in cell Cu$_2$-Cu$_1$ than in cell 2A-Cu$_2$; VHW with each dash of most distal submarginal row of silver-grey dashes bordered basally by dark grey, then orange-brown..................................... ***justina***

79(57). VFW with pale orange postdiscal band cut by red-brown line in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$; DFW with postdiscal band narrow at costa and cut by dark veins; DHW distal margin fringe with white scaling in each cell; VFW with silvery grey spot distal to postcellular bar in cell M$_2$-M$_1$; E. Andes............................ ***sichaeus***

VFW with pale orange postdiscal band not cut by red-brown line in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$; DFW with postdiscal band broad at costa and not cut by dark veins; DHW distal margin fringe entirely black; VFW with no silvery grey spot distal to postcellular bar in cell M$_2$-M$_1$; Costa Rica-W. Andes .... ***hesterbergi***

80(58). DHW white postdiscal band narrow, of almost even width throughout wing, tapering towards tornus; VFW with silver-grey submarginal marking in cell Cu$_1$-M$_3$ "U"-shaped.. ***olynthia***

DHW white postdiscal band of moderate width, tapering towards costa and tornus, broadest in cells M$_3$-M$_2$ and M$_2$-M$_1$; VFW with silver-grey submarginal marking in cell Cu$_1$-M$_3$ a straight, inclined dash.***justina***

81(65). VHW with spots forming first row of pale markings distal of white postdiscal band of even width throughout wing, or largest in cells M$_2$-M$_1$ and M$_1$-Rs, or in cells M$_1$-Rs and Rs-Sc+R$_1$, this row bordered distally by dark red-brown/brown band of even width or slightly broader in cell M$_2$-M$_1$ than M$_3$-M$_2$; VFW with black area between white/pale orange postdiscal block in cell 2A-Cu$_2$ and silver-grey submarginal spots undivided *(B1-5)*.. 82

VHW with spots forming first row of pale markings distal of white postdiscal band largest in cell M$_3$-M$_2$, then Cu$_1$-M$_3$, this row bordered distally by dark brown band much broader in cell M$_2$-M$_1$ than M$_3$-M$_2$ *(B1-4)*; VFW with black area between white/pale orange postdiscal block in cell 2A-Cu$_2$ and silver-grey submarginal spots divided by vertical pale orange/orange dash *(B1-5)* .... ***delinita***

82(81). VFW with silver-grey apical spots in cells R$_5$-R$_4$ and R$_4$-R$_3$; VHW with four silver-grey dashes distal of white postdiscal band in cell M$_1$-Rs; pale orange postdiscal marking in cell Cu$_1$-M$_3$ not divided by orange-brown line.. 83

VFW within no silver-grey apical spots in cells R$_5$-R$_4$ and R$_4$-R$_3$; VHW with three silver-grey dashes and a pale red-brown dash distal of white postdiscal band in cell M$_1$-Rs; pale orange postdiscal marking in cell Cu$_1$-M$_3$ typically divided in half by vertical orange-brown line.. ***erymanthis***

83(82). VFW with silver-grey submarginal dash in cell Cu$_1$-M$_3$ of similar size and shape to that in cell Cu$_2$-Cu$_1$ *(B1-6)*; VHW ground colour almost uniform orange-brown to red-brown 84

VFW with silver-grey submarginal dash in cell Cu$_1$-M$_3$ absent or much fainter and thinner compared to that in cell Cu$_2$-Cu$_1$ *(B1-6)*; VHW ground colour typically dark brown with red-brown to orange-brown band between first and second pale lines distal of white postdiscal band and orange-brown marginal ovals at each vein .... ***thesprotia***

84(83). VHW with spots of first row of pale whitish grey markings distal of white postdiscal band even dashes in all cells, or slightly larger in cells M$_1$-Rs and Rs-Sc+R$_1$... 85

VHW with spots of first row of pale whitish grey markings distal of white postdiscal band largest in cells M$_2$-M$_1$ and M$_1$-Rs .... ***erotia***

85(84). VFW with first discal cell bar slightly inclined to costa, and second and fourth cell bars concave; ventral pale lines distal of postdiscal band distinctly silvery grey; VHW with first and second discal cell bars broadly spaced, noticeably paler in area between, equidistant between third discal cell bar and basal red-brown line... ***phylaca***

VFW with discal cell bars approximately straight, particularly second cell bar, fourth cell bar slightly convex; ventral pale lines distal of postdiscal band silvery white; VHW with first and second discal cell bars close together, almost forming a single dark band, band closer to third discal cell bar than to basal red-brown line.. ***messana***

86(67). DFW with orange in cell Cu$_1$-M$_3$ filling base of cell; VFW with white postdiscal block in cell 2A-Cu$_2$ narrower than orange postdiscal block in this cell on DFW; pale orange postdiscal marking in cell Cu$_1$-M$_3$ split by orange-brown line near base and near distal margin; pale orange dashes in cell Cu$_2$-Cu$_1$ extend across entire cell; VHW with first two pale lines distal of white postdiscal band pale silver-grey, broader in cells M$_1$-Rs and Rs-Sc+R$_1$ .... ***heraclea***

DFW with orange in cell Cu$_1$-M$_3$ not filling base of cell; VFW with width of white postdiscal block in cell 2A-Cu$_2$ equal to width of orange postdiscal block in this cell on DFW; pale orange postdiscal marking in cell Cu$_1$-M$_3$ entire except for some indistinct orange scaling near base; pale orange dashes in cell Cu$_2$-Cu$_1$ only in anterior half of cell; VHW with first two pale lines distal of white postdiscal band pale grey, except white in cells M$_1$-Rs and Rs-Sc+R$_1$ .... ***atlantica***

87(1). DFW with some orange or white markings............... 88

DFW entirely dark brown .... ***zina***

88(87). DFW with postdiscal band vertical or inclined, of uniform colour, not broken in cell Cu$_1$-M$_3$ 89

DFW postdiscal band vertical, broken in cell Cu$_1$-M$_3$, a thin white band from anal margin to cell Cu$_1$-M$_3$, a very broad orange band from cell Cu$_2$-Cu$_1$ to costa...... .... ***donysa***

89(88). VHW with distal half varying shades of red/orange to brown, with some pale rows of markings, no dark brown lines parallel to veins bisecting each cell; VFW discal cell with a single silvery white/silvery grey band opposite middle of cell Cu$_2$-Cu$_1$........................ 90

VHW with distal half almost entirely brown or yellowish brown, with dark brown lines parallel to veins bisecting each cell; VFW discal cell with a pair of silvery white spots opposite middle of cell Cu$_2$-Cu$_1$, an anterior and a posterior spot, separated by a black line... 99

90(89). DFW with postdiscal orange or white markings in cells Cu$_1$-M$_3$ and M$_3$-M$_2$ not filling cell to distal margin 91

DFW with postdiscal orange markings in cells Cu$_1$-M$_3$ and M$_3$-M$_2$ filling cell to distal margin *(B3-5)*..............

.... ***stilesiana***

91(90). DFW with only a single white or orange postdiscal to submarginal marking in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$.... 92

DFW with three white postdiscal to submarginal markings in each of cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ .... ***demialba***

92(91). DFW with vertical or inclined orange postdiscal band 93

DFW with oblique white postdiscal band 100

93(92). VFW pale silver-grey area in distal half of discal cell undivided by a well-defined darker line, rarely with indistinct, incomplete line of black scaling *(B1-1)*; VFW with or without pale postdiscal marking in cell 2A-Cu$_2$ 94

VFW pale silver-grey area in distal half of discal cell completely divided by well defined, dark brown line *(B1-1)*; VFW with pale postdiscal marking in cell 2A-Cu$_2$ 101

94(93). VHW with silver-grey postdiscal band absent, broken, or continuous and extending throughout wing, bordered basally anterior of vein M$_3$ by dark red-brown line then silver-grey scaling, at least anterior of vein M$_2$ 95

VHW with continuous silver-grey postdiscal band extending throughout wing, bordered basally anterior of vein M$_3$ by dark brown line then broad orange band 102

95(94). DFW with orange postdiscal markings just distal of discocellulars in cells M$_2$-M$_1$ and M$_1$-R$_5$ at least twice as broad as orange subapical spots in those cells, or orange subapical spots absent................................... 96

DFW with orange postdiscal markings just distal of discocellulars in cells M$_2$-M$_1$ and M$_1$-R$_5$ of approximately equal width or narrower than orange subapical spots in those cells, or postdiscal markings absent 103

96(95). VFW with some submarginal silver-grey dashes distal of pale orange postdiscal to submarginal band in cells 2A-Cu$_2$ to M$_3$-M$_2$ 97

VFW with no submarginal silver-grey dashes distal of pale orange postdiscal to submarginal band in cells 2A-Cu$_2$ to M$_3$-M$_2$ 106

97(96). VHW with area between first and second discal cell bars whitish grey, with variable amounts of reddish scaling at inner edges of cell bars............................. 98

VHW with area between first and second discal cell bars orange-brown.. 109

98(97). DFW with distal edge of orange postdiscal band vertical and parallel to distal margin in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ *(B3-5)* .... ***ximena***

DFW with distal edge of orange postdiscal band inclined, much closer to distal margin in cell Cu$_2$-Cu$_1$ than Cu$_1$-M$_3$ *(B3-5)* .... ***boreas***

99(89). DFW with orange subapical spots in cells M$_2$-M$_1$ and M$_1$-R$_5$ .... ***mesentina***

DFW with subapical spots in cells M$_2$-M$_1$ and M$_1$-R$_5$ white or absent .... ***lycorias***

100(92). VHW with postdiscal band uniformly silver white from costa to tornus; area posterior to vein 3A silver white lined with orange-brown; W. Colombia ***ethelda***

VHW with postdiscal band steely grey with white spot at costa in cell Rs-Sc+R$_1$; area posterior to vein 3A orange; E. Andes to S. E. Brazil .... ***epione***

101(93). DFW with vertical orange postdiscal band parallel to distal margin .... ***tracta***

DFW with oblique orange postdiscal band extending from costa to tornus .... ***salmoneus***

102(94). DFW postdiscal orange band oblique, extending from costa to tornus.. ***ethelda***

DFW postdiscal orange band vertical, extending from costa to anal margin....................................... ***melona***

103(95). VHW with silver white postdiscal band from costa to tornus present 104

VHW with silver white postdiscal band from costa to tornus absent, postdiscal area entirely red-brown.. 110

104(103). VFW with pale postdiscal spots in cells Cu$_1$-M$_3$ and M$_3$-M$_2$ not split in half by darker red-brown line. 105

VFW with pale postdiscal spots in cells Cu$_1$-M$_3$ and M$_3$-M$_2$ split in half by darker red-brown line..... ***salus***

105(104). DFW with basal edge of postdiscal band from anal margin to cell Cu$_1$-M$_3$ slightly inclined to anal margin; VFW discal cell with thin, well defined dark brown basal streak; silver submarginal dash in cell Cu$_1$-M$_3$ reduced or absent; two silvery grey marginal spots present in cell 2A-Cu$_2$...... ***rothschildi***

DFW with basal edge of postdiscal band from anal margin to cell Cu$_1$-M$_3$ perpendicular to anal margin; VFW discal cell with broad, poorly defined orange basal streak; silver submarginal dash in cell Cu$_1$-M$_3$ of similar size to remaining submarginal dashes; silvery grey marginal spots absent in cell 2A-Cu$_2$ .... ***levona***

106(96). DFW with distal edge of orange postdiscal band projecting distally in cell M$_3$-M$_2$.......................... 107

DFW with distal edge of orange postdiscal band indented basally in cell M$_3$-M$_2$...........***leucophthalma***

107(106). VFW pale yellow postdiscal markings in cells M$_3$-R$_5$ close to postcellular bar (distance from basal edge of markings to bar much less than width of markings) 108

VFW pale yellow postdiscal markings in cells M$_3$-R$_5$ not very close to postcellular bar (distance from basal edge of markings to bar equal to width of markings)... ***lamasi***

108(107). VHW predominantly yellow; VFW with no white postdiscal spot in cell 2A-Cu$_2$.................. ***saundersii***

VHW predominantly dark orange-brown; VFW with white postdiscal spot in cell 2A-Cu$_2$ .... ***irmina***

109(97). VHW with continuous silver-grey postdiscal band with even basal edge from costa to cell 2A-Cu$_2$ (band may be darkened anterior of vein M$_1$) .....***salus***

VHW with silver-grey to whitish postdiscal spots, occasionally forming a band from costa to cell Cu$_2$-Cu$_1$, but not entering 2A-Cu$_2$, always with uneven basal edge .... ***zina***

110(103). VFW with distal edge of pale orange marking in cell Cu$_2$-Cu$_1$ nearer distal margin than that of marking in cell 2A-Cu$_2$ ....***justina***

VFW with distal edge of pale orange marking in cell 2A-Cu$_2$ nearer to distal margin than that of marking in cell Cu$_2$-Cu$_1$.. ***zina***

Species Groups

Aiello (1984) made the first explicit attempt to define species groups in *Adelpha*, based on early stage morphology and biology. She studied eighteen species and recognised seven groups, including the *A. serpa* group of previous authors. Otero & Aiello (1996) subsequently suggested that a new, eighth, species group might be required for *A. alala*, and they listed five additional species, of which the life histories were unknown at that time, as possible members. I have retained three of Aiello's groups, in which I have included additional species that she did not study, based on adult characters, and recognise an additional three that appear to be monophyletic on the basis of a preliminary cladistic analysis for the genus (Willmott, 1999, in prep.). It must be stressed that while the *A. serpa* group is strongly supported by many characters, this is not the case for the remaining groups, and they must be considered provisional. Synapomorphies and characteristics of each group are given in Table 1, and the species limits of each group are indicated by horizontal lines in Tables 2,3, and especially 8.

Although relationships are unresolved between the majority of remaining *Adelpha*, there are some clear groups that share many characters, and although it is not clear at the present whether such groups are mono- or paraphyletic, there is nevertheless a reasonable probability that they share similar morphological and biological traits. These groups have also been indicated in Tables 2-5 in the same manner, but are not formally recognised as species groups.

Table 1. Synapomorphies and other typical characters of species groups within *Adelpha*. Species included within each group are indicated in Appendix F.

Group:	Synapomorphies:	Other typical characters:	Ecological characters:
A. serpa	Male genitalia: clunicula absent or small bump; aedeagus with a sclerotised, spiny pad on the dorsal surface of the vesica. Wing pattern: DFW discal cell with basal streak placed near costa, enclosing anteriorly a dense patch of reddish scales; basal streak in VHW and VFW discal cell absent; well-defined black line extending from base of VHW to tip of humeral vein.	Male genitalia: typically with poorly developed ventral and dorsal medial lobes. Female genitalia: bands on corpus bursae heavily sclerotised with coarse teeth. Immature stages: pupa often with shimmering silver or gold areas.	Typically geographically widespread; often found perching in large clearings near rivers; relatively little geographic differentiation of wing pattern; hostplants diverse, not Rubiaceae.
A. alala	Wing pattern: dark lines bordering vein 3A on VHW greatly faded and reduced.	Wing pattern: third discal cell bar present on VFW; ventral colours all faded; outer submarginal series on VHW absent. Male genitalia: valva with few, large terminal spines. Immature stages: larval scoli greatly reduced.	Occur in high elevation cloud forests; larval hostplants Caprifoliaceae; known larvae construct shelters from hostplant leaves.
A. iphiclus	Wing pattern: postdiscal series on VFW broaden anteriorly, being further from inner submarginal series in cell M_2-M_1 than cell M_3-M_2.	Wing pattern: postdiscal and submarginal series on VFW typically visible throughout; upper postdiscal band on DFW absent.	Especially diverse in southeastern Brazil; often in secondary growth areas; relatively little geographic differentiation of wing pattern; hostplants all Rubiaceae.
A. phylaca	Wing pattern: densely packed, pale whitish scales along base of vein Rs on DHW. Male genitalia: clunicula broad; valva with terminal teeth extending along ventral edge; saccus large, almost same length as valva. Female genitalia: corpus bursae and ductus bursae large; sclerotised bands placed far apart.	Wing pattern: postdiscal series fused in cell Cu_2-Cu_1 on VFW and fused to postdiscal band in cell Cu_1-M_3; Male genitalia: valva with pronounced dorsal and ventral medial lobes. Immature stages: pupa with prominent, hooked dorsal projection on thorax; final instar larva pale with dark area laterally on thorax-A2.	Usually occur in lowland primary forest; perch along forest edges or in canopy; hostplants diverse, not in Rubiaceae.
A. capucinus	Subapical orange spot in cell M_2-M_1 on DFW aligned with distal edge of orange marking in cell M_3-M_2; postdiscal series fused on VFW in cell Cu_1-M_3 but separate in cell Cu_2-Cu_1.	Male genitalia: valva broad throughout, not tapering, squared at tip with terminal spines; clunicula long; saccus relatively short compared to valva.	Typically confined to lowland forest.
A. cocala	Female genitalia: corpus bursae lacking sclerotised bands, rounded, typically with ductus bursae of approximately even width, rather than gradually broadening between ductus bursae and corpus bursae.	Generally small species, orange tornal spot on DHW often absent, thorax and abdomen relatively narrow.	Usually occurring in premontane cloud forest habitats, many species with restricted ranges; strongly mimetic, with sharp regional differentiation of dorsal wing pattern.

BIOLOGY

Habitats

Adelpha species occur in a very wide variety of forested life zones, and microhabitats within life zones, and they have been recorded from sea level to 3000m. While greater species richness is found in wet forests (see below), a few *Adelpha* are restricted to drier life zones, ranging from semi-deciduous to deciduous forest (*A. fessonia*), xeric *Acacia* scrub (*A. fessonia lapitha*), mixed pine-hardwood forest (*A. gelania*) and oak-dominated deciduous woodlands (*A. bredowii*). In the case of *A. bredowii*, at least, this habitat association may imposed by the presence of its hostplants, various species in the genus *Quercus* (see Appendix C). A large number of species are also confined to cloud forest habitats in the Andes and other mountainous areas.

Like many sun-loving nymphalid butterflies that require elevated thoracic temperatures for rapid flight (Chai & Srygley, 1990; Srygley & Chai, 1990), *Adelpha* species are most often observed in areas with bright sunlight, such as forest openings caused by treefalls, river sides, or anthropogenic habitat “edges”, such as paths and roads. However, *Adelpha* individuals also typically numerically dominate the butterflies in canopy traps in primary forest (Willmott & Hall, pers. obs.), indicating that they are also present within undisturbed habitat but are largely confined to the canopy. The highest numbers of *Adelpha* species occur at localities with extensive primary forest that has been variably disturbed to create a mosaic of microhabitats, providing abundant young growth of hostplants and a rich variety of sites for male perching (see below). In secondary forest *Adelpha* diversity drops markedly, particularly among members of the “orange and white banded” apparent canopy guild (Willmott & Hall, unpub.). Certain species are, however, characteristic of severely disturbed habitats, particularly *A. cytherea* and, to a lesser extent, *A. iphiclus*, which use several species of secondary growth weeds as hostplants. Nevertheless, both of these species also occur in the most intact primary forest, and no species of *Adelpha* can be said to be a true secondary growth specialist.

Phenology

There is relatively little information available on the phenology of *Adelpha* species. My research in Ecuador suggests that species and individual abundance, represented by the adult life stage, is highest during the wet season and early dry season, from May to August on the eastern slopes and January to June on the west. These observations concur with the study by Wolda (1978), in Panama, who found that foliage-feeding insects were generally much more abundant in the wet season, when there was vigorous new plant growth. Although DeVries (1987) reported that most *Adelpha* species are more abundant in Costa Rica in the dry season, this may be an artifact of the higher number of collecting days compared with the wet season; using baited traps, several otherwise rare species have been found to be not uncommon in Costa Rica during the wet season (Hall & Willmott, 1993). DeVries *et al*. (1997), in a controlled trapping study in eastern Ecuador, reported that nymphalid species and individual abundance is highest there in the wet season.

In many instances, individuals of a particular species were encountered in numbers over a period of a couple of days, but never seen again despite repeated visits to a site. This was the case with *A. hesterbergi*, *A. lamasi* and *A. levona* in northwestern Ecuador. This suggests the possibility that pupal eclosion may perhaps be triggered by some environmental cue, such as heavy rains. Annette Aiello (pers. comm.) reports to me a recent outbreak of *A. iphiclus* in Panama, that she believes to be linked to an unusually dry period causing high mortality in predators and parasitoids of the immature stages, which usually control population numbers. Interestingly, however, Wolda (1992) found no correlation between extended dry periods and subsequent insect abundance in studies of various insect orders in Panama. It is clear that remarkably little is known of the effects of various abiotic and biotic factors on the temporal diversity and abundance of *Adelpha* species, or indeed any diverse neotropical butterfly genus.

The majority of *Adelpha* species seem to be present as adults throughout the year, even if abundance is seasonal, but *A. bredowii eulalia* has been reported to have two distinct broods in the USA, from May to June, then from August to October (Ferris & Brown, 1981; Cary, 1994). The larvae are in diapause during the winter (Ferris & Brown, 1981). It is very probable that species in the more strongly seasonal, more temperate regions of eastern and southern Brazil to Argentina, Paraguay and Uruguay may have similar life cycles, and Hoffmann (1937a) suggested that *Adelpha syma* pupae in southern Brazil were in diapause over the winter months. For the remaining species there are, however, no published observations and museum specimen data are too few to draw any conclusions.

Rarity

Studies of rarity are concerned with describing and understanding variations in abundance of individuals in space and time (Gaston, 1994). Many factors can influence the perceived rarity of a species, including absolute geographic range, population density and size, seasonal and stochastic fluctuations in population size, adult population size and adult behaviour. Of these factors, the first five are population attributes of legitimate interest in studies of rarity, while the latter two are particularly relevant to insect populations, which are typically surveyed in the adult life stage, and serve to introduce error into measurements of abundance.

As discussed above, even in equatorial regions adult *Adelpha* appear to fluctuate seasonally in abundance, though it is not clear whether this is a direct reflection of varying population size or indicative of immature stage diapause. In both eastern and western Ecuador several species are known only from the wetter months of the year, despite this being a period of the year when proportionally less time is invested by collectors. Also, as mentioned above, many adult *Adelpha* appear to be confined to the forest canopy, and were it not for the use of baits many would remain very seldom seen. The use of traps in Ecuador has demonstrated certain species, such as *A. pollina*, *A. heraclea* and *A. boreas*, to be widespread and common in many localities, despite the low numbers of specimens in collections. However, varying attractive powers of baits on adults of different species is a confounding variable that is not understood, and it should not be assumed that because a species is rarely found at a bait that it is has a low population size. Males of *Adelpha shuara* are locally common perching in groups along rivers in eastern Ecuador, yet none to date has been recorded on rotting fish, the most attractive known bait for the genus, despite intensive trapping at several sites. Nevertheless, bait trapping certainly improves our understanding of species distribution and abundance, even if only imperfectly. Perhaps the clearest indication of the effect of behaviour on perceived rarity is the sex ratio of specimens in collections. For almost all species there are more known specimens of males than females, which overall outnumber females in collections by approximately 4:1, yet there is little indication of a biased sex ratio in reared specimens (e.g., Moss's material in the BMNH). This ratio probably reflects the propensity for males to occur in groups (see Adult ecology below) and to be attracted to a wider variety of nutrient sources.

With the above *caveats* in mind, it is still possible to investigate some of the causes and patterns of rarity in *Adelpha*. One simple measure of rarity, which reflects all of the factors listed above, is the number of specimens in world collections. Fourteen species and 83 subspecies are represented by fewer than 25 specimens in all of the collections examined (Fig. 4). One species, *A. herbita*, is known only from the single female specimen on which the original illustration is based, and the whereabouts of this specimen, if it still exists, is currently unknown. This species is probably rare in collections because it occurs in a geographically restricted area (montane regions of southeastern Brazil), is local and occurs in small populations (several members of the *A. serpa* group, of which this is a member, tend to congregate on hill tops, suggesting low population densities [see below]), may have adult populations that fluctuate temporally in size (given the marked seasonality of its known range), and may be confined to poorly collected montane habitats where it flies in the canopy (the closely related *A. diocles* exhibits these characteristics).

Fig. 4. Abundance of *Adelpha* species in each class of number of specimens recorded.

Perhaps the most important factor affecting the number of specimens in collections is range size; many species that are rare in collections inhabit thin bands of cloud forest in montane regions of central America, the Andes and southern Brazil. The majority of recently described species occur in these montane habitats (Beutelspacher, 1976; Steinhauser & Miller, 1977; DeVries & Chacón, 1982; Willmott & Hall, 1995, 1999), where they may, however, be not uncommon. Such habitats have historically been poorly collected due to problems of access from the steepness of the terrain, and the difficulties of collecting in almost perpetual rain and cloud. They continue to provide new species in many other groups of butterflies (Hall & Willmott, 1995; Willmott *et al*., in press) and their *Adelpha* fauna still remains relatively poorly known.

Although range size accounts for a substantial portion of the variation in numbers of specimens in collections, and thus perceived rarity, considerable variation in abundance is apparent between species at single localities. Several recent studies have suggested that the rarity of a particular species at a locality is typically not an intrinsic property of that species, but determined by the local availability of limiting resources (Schoener, 1987; Brown *et al*., 1995). In other words, "most species that are rare somewhere are not rare and are often common in some to many other places" (Schoener, 1987: 166). One putative result of this effect is a peak in population density at the centre of a range and decline towards the edges (Brown, 1984, and references therein). Brown (1984) explained the latter pattern as a result of spatial autocorrelation of evironmental variables; the most favourable combination of resources occurs at one locality and decreases with distance, and declining population density reflects the increasingly harsh environment further from the centre of distribution. Certainly, several species of *Adelpha* appear to show a decline in population density towards the edges of their ranges; examples include *A. fessonia fessonia* at the eastern edge of its range in Costa Rica (DeVries, 1987), *A. basiloides*, *A. iphicleola*, and probably several other species yet to be recorded, at the southern limit of their ranges in the Chocó of western Colombia and western Ecuador, and *A. cytherea* at the western edge of its range in Mexico. The Atlantic region (extra-Amazonian Brazil, Paraguay, N. Argentina and Uruguay) also exhibits a pronounced pattern of the greatest number of species records occurring in the central area (Rio de Janeiro-Santa Catharina, Minas Gerais), suggesting species abundance probably falls to the north and south. Nevertheless, the remaining and the majority of species appear to show little change in abundance throughout most of their range, in contrast to the predictions of Brown's (1984) model. In fact, the majority of species of *Adelpha* that are rarely recorded at a particular site appear to be rare throughout their range. Although there are obvious differences between single sites in abundance of certain species, such differences typically reflect the presence of male perching sites and are probably not indicative of true individual abundance. In eastern Ecuador, the seven rarest lowland species (in terms of numbers of records by myself (Willmott & Hall, unpub.)) known or predicted to occur there (*A. nea*, *A. radiata*, *A. thoasa*, *A. viola*, *A. barnesia*, *A. ximena*, *A. amazona*), representing the rarest 25% of species, are all rare throughout the Amazon basin (represented by relatively few specimens in collections from every country). Many of these species are more common at the base of the Andes than elsewhere in the Amazon basin, despite this being the western limit of their range (see range maps, Figs. 281-293). The studies of Schoener (1987) and Brown *et al*. (1995) were both based largely on data from birds within temperate to subtropical continental regions; such regions may have a much greater habitat spatial heterogeneity, which produces significant local variation in species abundance, in comparison to the more uniform neotropical forests, and it is perhaps significant that abundance in *Adelpha* of the Atlantic region appears to show the closest correspondence to such models.

An additional implication of Brown's (1984) model accounting for distribution/abundance patterns is that species that are locally common can presumably overcome the restrictions of certain limiting environmental variables and might therefore be expected to be more widely distributed. A positive correlation between local abundance and range size is regarded as a "general signature of natural assemblages" (Gaston *et al*., 1997: 390; Newton, 1997). Although precise data are lacking to test this hypothesis rigorously for *Adelpha*, one simple test can be made by using latitudinal range as a surrogate measure of range size, and comparing the two groups representing the extremes of rarity within a single area. I therefore selected the seven rarest (listed above) and seven most common (*A. plesaure*, *A. iphiclus*, *A. cytherea*, *A. capucinus*, *A. thesprotia*, *A. mesentina*, *A. cocala*) lowland species predicted to occur in eastern Ecuador (24 are recorded, 26 expected; 7 represents *ca*. 25%, a common "cut-off" proportion for classifying species as rare or common (Gaston, 1994)), and calculated average latitudinal range sizes, based on numbers of occupied 10° bands of latitude, for both groups. Although the "rare" group has a slightly lower average latitudinal range (80°) than the "common" group (90°), the difference is not statistically significant (Mann-Whitney *U*-test, p=0.21). Due to the shape of the neotropical region, the area contained by a 10° band of latitude is much greater in the Amazon basin than to the north or south; therefore, if anything, use of latitudinal range as a substitute for geographic range will overestimate the differences in range size between widely and narrowly distributed species, making the differences in average range size obtained here less significant. I suggest that since most Amazonian *Adelpha* range edges follow the edges of major biogeographic regions (see Fig. 22), abiotic environmental variables are unlikely to be a major limiting factor in controlling their distribution, thus violating a key assumption contained in Brown's (1984) model. Thomas & Mallorie (1985) also found no support for a relationship between rarity and range size in butterflies of the Atlas mountains in Morocco.

The fact that many *Adelpha* species appear to show neither a relationship between local population density and geographic position within a range, and between rarity and range size, might also be due to sampling artifacts. Since one must rely heavily on trapping to sample canopy *Adelpha*, variable attraction to baits may cause some species to appear more rare than reflects actual population densities. Members of the *A. serpa* group appear to be less strongly attacted to carrion baits, perhaps enhancing the rarity of *A. nea* and *A. radiata*. However, it seems unlikely that sampling artifacts can entirely explain differences in rarity between *Adelpha* species; among the *A. serpa* group, both *A. serpa* and *A. paraena* are more commonly recorded than the very closely related *A. nea* and *A. radiata*, throughout the neotropical region. In addition, behavioural traits such as "hill-topping" in certain rarely recorded species (e.g., *A. radiata*) are suggestive of low population densities (see below). Unfortunately, there are too few species of *Adelpha* for which we have sufficiently detailed biological information to begin to make generalisations about traits associated with rarity (e.g., Kunin & Gaston, 1993, 1997), but rare species appear to occur in all major species groups, suggesting that no single factor may be responsible. Hostplant abundance and distribution is perhaps the most obvious candidate for explaining differing population densities, but no known *Adelpha* hostplants seem to be very rare, and many (e.g., hostplants of *A. phylaca* and *A. serpa* groups – see below) are common, secondary growth plants. Larvae of the commonest species in the genus, *A. cytherea*, feed on the same hostplant as the widespread but rare *A. viola* (Moss, 1933). Much more field research must be conducted before we can begin to understand the complex ecological factors underlying rarity in *Adelpha*.

Hostplants

There exist hostplant records for at least 42 species of *Adelpha*, comprising 22 families, 66 genera and 116 species of plants (see Appendix C; a few records are not listed but have been reported to me in confidence by G. Beccaloni – they will be published in the near future (Beccaloni *et al*., in prep.)), representing certainly one of the widest host breadths of any nymphalid genus (Ackery, 1988). The most important single contributors to our knowledge of *Adelpha* hostplants are Müller (1886), Moss (1933) and Aiello (1984), with a number of records by Janzen, Haber, Marquis and DeVries (*In*: DeVries, 1986), and several reported to me by Albert Muyshondt and Andre Freitas (pers. comm.). Many of the identifications of *Adelpha* species in the hostplant literature are unreliable or erroneous, and I have tried to correct as many of these misidentifications as possible, based on descriptions of the adult, the locality and voucher material. The latter is unfortunately lacking for the majority of species, rendering a number of records almost worthless.

Many *Adelpha* appear to be highly polyphagous; *A. serpa*, for example, is recorded from 13 genera of seven plant families. Certain groups of families, such as Moraceae, Urticaceae and Tiliaceae, are characteristic of species from phylogenetically distant groups, and it is unclear what factor of hostplant biology mediates the host choice. The family Rubiaceae is responsible for the great majority of records (22 species) and appears throughout the genus, with those species that do feed on Rubiaceae generally being unrecorded on other families (Aiello, 1984). Other important families are Moraceae (7 *Adelpha* species), Verbenaceae (5 species), Tiliaceae and Caprifoliaceae (4 species), Melastomataceae, Malpighiaceae and Rosaceae (3 species). Four species have been reported on Aquifoliaceae, but all of these records are historical and may apply to only a single species.

Despite there being hostplant records for nearly half of the genus, a number are unreliable and a great many are concentrated into two species groups, the *A. serpa* and *A. phylaca* group. No doubt this is due to the larvae feeding on plants that grow in disturbed areas in lowland regions, habitats most frequented by field biologists. It is thus not possible at the present to draw many conclusions about evolution of hostplant choice within the genus, but two patterns are of possible evolutionary significance. The most primitive group in the genus, the *A. alala* group, has been recorded almost entirely on the genus *Viburnum*, family Caprifoliaceae; this family is otherwise unknown as a hostplant in the genus, but is a common hostplant of other Asian and European limenitidines, such as "*Limenitis*" (*Ladoga*) *camilla, reducta, Parasarpa zayla* and a number of Asian "*Limenitis*" (Ackery, 1988), that appear to be the closest relatives of *Adelpha* (Willmott, 1999). The low diversity of the *A. alala* group, which is confined to montane habitats where its hostplant grows, contrasts strongly with the richness of more derived *Adelpha* faunas, which peaks in lowland habitats. The larval association with the diverse family Rubiaceae is pervasive throughout *Adelpha,* and it may be that an early switch to this host family allowed *Adelpha* species the potential to expand into the numerous forest life zones that they occupy today. However, better resolution of the phylogenetic hypothesis for *Adelpha* (Willmott, in prep.) is necessary to explore this scenario further.

Immature Stage Morphology and Biology

The pioneering work of Müller (1886) in southeastern Brazil set the stage for studies of the immature life histories of *Adelpha* butterflies (see Appendix D). Müller reared, described and figured certain immature stages for seven species of *Adelpha*, and his descriptions still remain some of the most detailed published. Müller concentrated on describing larval morphology, which might one day provide a source of characters for cladistic analyses of the genus. Moss (1927) reared 11 species within six months of his arrival in Pará, Brazil, providing the next major contribution to our knowledge (Moss, 1933), followed by Aiello (1984), and both of these authors figured larvae and pupae. Aiello (1984) summarised almost all of the published information and her paper remains the most important work to date on *Adelpha* early stages. There are a number of other reports of *Adelpha* early stages in the literature, but all suffer from the same problems of identification as for hostplant records, and the vast majority offer no illustrations, only brief descriptions from which taxonomic conclusions can seldom be drawn. There is only one paper that figures photographically any part of an *Adelpha* life history in colour (Harry, 1994), while very few papers achieve the rigour of Young's (1975) report on the life history of *A. leucophthalma*, or contain line drawings of larvae and pupae, as in Aiello (1984, 1991).

I strongly encourage anyone who has reared *Adelpha* to publish their results, and illustrate aspects of the morphology that are potential sources of phylogenetic characters. Appendix D summarises published information on *Adelpha* life histories; clearly, the information is fragmentary for many species, even those that may be frequently reared by resident lepidopterists. Even in the few cases of species that have received adequate treatment, additional information on the immature stages is of value in assessing local or geographic variation in morphology or life history. Aiello (1984) figured frontal views of fifth instar larval head capsules, lateral views of fifth instar larvae, lateral views of pupae and dorsal views of pupal head horns, and all of these should be illustrated in any new life history description. Enlarged illustrations of the thoracic, and certain abdominal scoli (Fig. 6), the crochet arrangement on the abdominal prolegs (Fig. 7) and the shape of the cremaster base on the pupa (Figs. 19,20), may all also provide important phylogenetic information. As *Adelpha* larvae are solitary it may not be possible to preserve specimens in alcohol, but wherever this is possible it should certainly be done (see Carter *et al*. (1997) or DeVries (1997) for a review of techniques for larval preservation).

I give a broad summary here of our knowledge of *Adelpha* immature stages and principal publications, using the terminology of Aiello (1984) and Stehr (1987). Larval segments are referred to as thoracic 1-3 (T1-T3) and abdominal 1-10 (A1-A10) (see Fig. 5). Chalazae are raised, sclerotised, conical structures that bear a single seta, and in *Adelpha* such structures typically ring the head capsule (Fig. 9). Scoli are longer, branched structures that bear additional lateral setae or spines (Fig. 6).

Oviposition. Females typically seek oviposition sites in the late morning and middle of the day, and the majority of *Adelpha* hostplants selected by females occur in recent forest openings, and along the edges of forest and rivers. However, it is highly probable that many species oviposit in addition, or exclusively, in the canopy. The female of *A. iphiclus* alights upon a leaf and walks backwards, seeking a suitable site to oviposit with the tip of the abdomen. After oviposition the female takes flight, but may land on the same leaf and deposit further eggs. Eggs are deposited beneath the surface of leaves by the abdomen being curled under from the leaf upperside (Aiello, 1984). Reports of egg placement are rare in the literature (summarised by Aiello, 1984); most species deposit a single egg at the tip of a leaf on the upperside, while certain species typically oviposit next to a damaged portion of leaf (Aiello, 1984; DeVries, 1986). Up to four eggs may be deposited on a single leaf (Aiello, 1984), but often the plant chosen is a seedling and only a single egg is laid per plant.

Eggs. The eggs of all *Adelpha* species known to date are typical of the tribe, having hexagonal, concave facets with setae at the interstices (see Aiello, 1984).

First instar larvae. There are virtually no detailed descriptions and no figures of first instar larvae, which according to Aiello (1984) are all identical in form and some shade of brown or grey. The head bears setae but none of the chalazae of later instars, and only pale bumps on the body where future scoli are situated. After the first meal larvae take on the colour of the hostplant, though the head remains brown.

Second to fourth instar larvae. From the second instar on the head is ornamented with chalazae and numerous round, tiny pits, which may be of contrasting colour to the head capsule. The body begins to develop scoli, arranged in three rows, subdorsal, supraspiracular and subspiracular. Typically the subdorsal scoli on T2 & 3 and A2, 7 & 8 are slightly larger than others. Some species undergo colour and pattern changes, while in certain species, such as *A. basiloides*, the colour depends on the hostplant (Aiello, 1984).

Fifth instar larvae. Fifth instar larvae are diverse in form, colour and pattern. All species have dense chalazae around the head capsule (Fig. 9), the size of which may vary interspecifically (Aiello, 1984), but homologous chalazae may be identified from their position in each species. Since chalazae may provide a source of phylogenetic characters, I have labelled the principal head chalazae in *Adelpha* to help identify homologous chalazae and assist their description (Fig. 9). Aiello (1984) also used numbers to denote chalazae, but referred only to the frontal series; since no other authors have yet made use of her system, for the sake of clarity and to include all major chalazae I have used a different numbering system. All species have three principal series of chalazae; four chalazae on the front of the face, and rows of four then six laterally. Two species, *A. heraclea* and *A. iphiclus*, have a well developed fifth chalaza in the medial row, between m3 and m4 (see Fig. 9). In almost all species the posterior row of chalazae is the best developed, but in derived members of the *A. serpa* group the m1 chalaza is the longest (Fig. 9). The anterior series is frequently reduced, and almost absent in at least one species (*A. iphiclus*). Head capsules may also be patterned with dark and light areas, which may form distinct vertical stripes (Müller, 1886; Aiello, 1984).

The body scoli reach their peak of development in the final instar, and in most species are most pronounced on segments T2 & 3 and A2, 7 & 8. The subdorsal row is always better developed than the supraspiracular or subspiracular rows (Fig. 5), and while the dorsal scolus is often visible as a single spine, it is developed into a cluster in one species, *A. melona* (see Fig. 6f,g). Thoracic scoli are typically curved anteriorly and that on A2 is often directed posteriorly (Fig. 5, 6a-e, 6h-j). In almost all species, scoli are reduced on the prothorax (T1) and first abdominal segment (A1), while in the *A. alala* group of species they are almost obsolete on all segments with the exception of the second and third thoracic segments (Otero & Aiello, 1996; Fig. 6a, 118b). While scoli typically arise directly from the body, in several species (*A. cytherea*, *A. viola*, *A. salmoneus*) that on A2 has a raised, conical base (Fig. 6i). Known scoli exist in two main forms, termed terete and flattened by Aiello (1984), though these forms may prove to represent the ends of morphological clines. Terete scoli bear 3-5 radiating spines at the apex, with additional spines along the length of the scolus, and vary greatly in their length, width and the density of lateral spines (Fig. 5, 6, except 6h). The shape of lateral spines may prove a useful phylogenetic character; in most species the spines are even in width or smoothly tapering, but in one species, *A. capucinus*, they are conspicuously swollen at their base (Fig. 6d,j). Flattened scoli are characteristic of more derived members of the *A. serpa* group, and have a leaf-like appearance. The spines are flattened, arranged in two opposite rows and may be densely packed, or even appear fused (Müller, 1886; Fig. 6h).

The majority of larvae have lateral, inclined darker stripes on the abdomen, while in members of the *A. phylaca* group these stripes are absent and there is instead a large, lateral dark coloured block from T1 to A2 (Fig. 121) (Moss, 1933; Aiello, 1984). The larvae of *A. alala* is almost uniformly green (Otero & Aiello, 1996), while that of *A. donysa* is uniformly pale green with a darker ventral half to the body (Fig. 118b).

In most *Adelpha* species that I have examined (*A. thesprotia*, *A. viola*, *A. mesentina*, *A. heraclea*, *A. capucinus*, *A. paraena*, *A. plesaure*, *A. cytherea*), the crochets of the larval abdominal prolegs are clearly differentiated into two types (Fig. 7), but crochets appear to be uniform, or at least more so, in more apparently primitive members (*A. tracta* and *A. fessonia* - Willmott, 1999, in prep.) and other limenitidine genera (e.g., “*Limenitis*” (*Ladoga*) *camilla*, *Limenitis populi*). Unfortunately, this character is often difficult to assess without alcohol-preserved material, though it might be visible in live specimens. In all examined species of *Adelpha* the anal shield is covered with tiny, short spines in the central region, while other genera (e.g., *Limenitis arthemis*) have the spines reduced in the centre of this region (Fig. 8a,b). Both of these characters may prove to be phylogenetically informative at higher levels and would therefore be worth reporting.

Pupa. Pupae are also very variable in morphology, but all have the posterior wing margins protruding as keels, and the second thoracic and second abdominal segments expanded to form projections (Müller, 1886; Moss, 1933; Aiello, 1984; Figs. 10-20). The thoracic projection is smaller and directed posteriorly, while the abdominal projection may be elongated to form a large, laterally flattened hook (Müller, 1886; Moss, 1933; Aiello, 1984; Figs. 12,14,121a). All other abdominal segments terminate in a sharp, dorsal ridge. Derived members of the *A. serpa* group have small, conical, lateral projections on segments T2, T3, A3 and A4, just above the spiracles (Figs. 10,117). The shape of the terminal abdominal segments may differ significantly between species (Figs. 19,20), and may prove to be a useful phylogenetic character. The head typically bears a pair of laterally pointing projections, which are variable in size, shape and orientation (Aiello, 1984; Figs. 10-18). Pupal colour varies from pearly white to yellowish, brown, green, copper or shimmering gold or silver, and the sutures may be black (Figs. 117-122). All pupae apparently give the impression of being empty or diseased (Aiello, 1984).

Development time. Aiello (1984) summarises the sparse available information on development time, which ranges from five to over thirteen weeks. Development time is rather variable within species and may depend on the hostplant (Aiello, 1984). *A. basiloides* is known to occasionally pass through six instars, which nevertheless take no longer to develop than the usual five.

Larval behaviour. *Adelpha* larvae, upon hatching, eat some or all of the egg shell and begin to feed on the leaf tip, leaving the midrib intact, a behaviour observed in many nymphalids (Müller, 1886; Moss, 1933; Aiello, 1984). Typical of many members of the Biblidinae and Charaxinae, larvae rest when not feeding facing away from the leaf stem on the exposed midribs, and extend them by means of fecal material bound with silk, often constructing similar supports on lateral veins (Müller, 1886; Harvey, 1991). Several supports may be constructed during each instar. After moulting to the final instar, larvae rest on the upper surface of the leaves (Müller, 1886; Moss, 1933; Aiello, 1984).

First to fourth instar larvae of *Adelpha* also engage in a distinctive activity first reported by Müller (1886), accumulating frass, and sometimes bits of dead leaf material, bound with silk, to form a mass surrounding the base of the support or suspended beneath. *Adelpha basiloides* also consistently constructs a small, usually curved larva-shaped mass on the leaf surface, away from the leaf edge or usual

Fig. 5-8. Fifth instar larval morphology; all Brazil, BMNH[MM], unless stated otherwise. **5**: *A. thesprotia*, lateral view of larva. **6**: subdorsal scoli (unless stated otherwise), lateral view: **a**: *A. tracta*, Costa Rica (PJD), T2; **b**: *A. melona leucocoma*, T2; **c**: *A. viola pseudococala*, T2; **d**: *A. capucinus capucinus*, T2; **e**: *A. heraclea heraclea*, T2; **f**: *A. capucinus* (as 6d), T3; **g**: *A. melona* (as 6b), T3; **h**: *A. paraena paraena*, A2; **i**: *A. viola* (as 6c), A2; **j**: *A. capucinus* (as 6d), A2; **k**: *A. thesprotia* (as 5), A4; **l**: *A. capucinus* (as 6d), A4; **m**: *A. melona* (as 6b), A10; **n**: *A. capucinus* (as 6d), A10. **7**: *A. thesprotia* (as 5), ventral, anterior view of A3 prolegs. **8**: anal plate (dorso-posterior view of A10): **a**: *A. melona* (as 6b); **b**: *Limenitis arthemis*, Florida, USA (coll. Hugo Kons).

Fig. 9. Fifth instar larval head capsules, all anterior view, *melona* with lateral view also; all specimens from Brazil, BMNH[MM], except: *A. tracta*, Costa Rica (PJD); *A. fessonia fessonia*, USA (FSCA); *A. iphiclus/iphicleola*, Costa Rica *(*PJD).

Fig. 10-20. *Adelpha* pupal morphology; all Brazil, BMNH[MM], unless stated otherwise. **10-14**, a, lateral view of pupa; b, dorsal view of head horns: **10**: *A. serpa celerio*, Costa Rica (PJD); **11**: *A. tracta*, Costa Rica (PJD); **12**: *A. fessonia fessonia*, USA (FSCA); **13**: *A. melona leucocoma*; **14**: *A. thesprotia*. **15-17**, dorsal view of head horns: **15**: *A. plesaure phliassa*; **16**: *A. viola pseudococala*; **17**: *A. capucinus capucinus*. **18**: *A. heraclea*; **19-20**, a, lateral view of terminal abdominal segment; b, dorsal view of terminal abdominal segment: **19**: *A. capucinus capucinus* (as 14); **20**: *A. thesprotia thesprotia* (as 11).

The behaviour of known members of the *A. alala* group (*A. alala* and *A. donysa*) is unique within the genus (Otero & Aiello, 1996; A. Muyshondt, pers. comm.); from the late first instar onwards the larva constructs a shelter by making two opposing cuts in the leaf, perpendicular to the midrib, then pulling the two leaf flaps down and fastening them with silk. The larva rests in this shelter when not feeding, and the shelter entrance typically has a curtain of small pieces of leaf material left by the feeding first instar. Larvae use these shelters until the late fourth instar, after which they rest on the leaf surface. The closely related, Old World species "*Limenitis*" (*Ladoga*) *reducta* and "*Limenitis*" (*Ladoga*) *camilla* construct similar shelters, which are used for hibernation (Aiello, 1984; Tolman, 1997). Since the larva of *L. camilla* has typically well-developed scoli, it seems plausible that the loss of scoli in members of the *A. alala* group result from their adaptation of leaf shelters for protection throughout the early instars.

Larvae of all species rest in a variety of positions, summarised by Aiello (1984). These include:

1. Straight, found in all instars, typically while resting on constructed leaf supports.
2. Front-Curved, in which the support is gripped by the prolegs and the thoracic to A2 segments raised and curved downwards, used by larvae about to moult.
3. Front-Arched-Rear-Up, in which the portion from the head to A2 are raised, curved so that the front of the head is flat on the leaf surface and the thoracic scoli pointing forward, and the posterior portio (A7-A10) are raised. This posture is defensive and is adopted when the larva is disturbed.
4. Curled, in which the larvae curls into a "C" or "J" shape so that the scoli are directed outwards all around. This is probably also a defensive position.

Adult Ecology

Nutrition

Adult *Adelpha* have been recorded at a variety of nutrient sources, of which the most numerically important is rotting carrion. Although feeding at decaying animal matter has been mentioned occasionally in the literature (e.g., Adler, 1982; Sourakov & Emmel, 1995; Austin & Riley, 1995), the presence of this behaviour in a significant proportion of the tropical forest butterfly fauna remains unappreciated (Hall & Willmott, 2000). Of the 55 species of *Adelpha* that I have recorded in eastern Ecuador, 47 were strongly attracted to rotting fish, and many were not seen outside of traps. Of the species not recorded on this bait, only *A. shuara* and *A. salmoneus* are sufficiently common to believe they might genuinely not feed on decaying animal matter. Many *Adelpha* have also been recorded feeding at damp sand and mud, particularly at urine, a behaviour known as puddling.

In contrast to carrion, it is well known that certain neotropical forest nymphalid genera feed at rotting fruits (DeVries, 1987, 1988; Daily & Ehrlich, 1995; DeVries *et al.*, 1997; DeVries *et al.*, 1999). However, fruit baits seem to attract many fewer species and individuals of *Adelpha* (and most other butterfly groups; pers. obs.) than carrion baits; I recorded just nine *Adelpha* species in Ecuador on rotting fruit, and only 23 species have been reported feeding on fruits from throughout the generic range. Plant families whose fruits attract *Adelpha* include Musaceae (banana), Melastomataceae, Anacardiaceae (mango), Myrtaceae (guava), Sterculiaceae, Malpighiaceae, Lauraceae and Rubiaceae.

Sixteen species of *Adelpha* have been observed feeding at flowers, with the majority of records in drier, more temperate parts of the range. Seven plant families have been recorded, of which Asteraceae, with 13 recorded *Adelpha* species, is by far the most common, followed by Boraginaceae with two species, then Euphorbiaceae, Vochysiaceae, Sapindaceae, Rubiaceae and Verbenaceae, with one species on each (full information and references for all feeding records are given in the species accounts).

Hall & Willmott (2000) discuss the possible nutritive benefits from feeding on rotting fish, which appears to offer similar nutrients to puddling (Downes, 1973). Sodium ions have been shown to stimulate puddling (Arms *et al*., 1974), and this is a probable nutrient obtained from rotting fish, which is fed on exclusively by male *Adelpha*. Sodium is donated to the female via the spermatophore during copulation in certain butterflies (Boggs & Gilbert, 1979), and access to both sodium and nitrogen increases male mating success and female reproductive success (Dunlap-Pianka *et al*., 1977; Pivnick & McNeil, 1987; Lederhouse *et al*., 1990; Boggs, 1990, 1995). Sodium is probably also important for the high neuromuscular activity of males that exhibit territorial perching behaviour (Downes, 1973; Arms *et al*., 1974; Hall & Willmott, 2000). In addition, though there is no evidence to date, males may also be seeking amino acids to maintain their thoracic muscle mass. Rotting fruits and nectar are probably both sources of carbohydrates, the energy source for powered flight. One possible explanation for the apparent greater attractivness of carrion baits, compared with fruit baits, may be the more ephemeral nature of the former resource in forest habitats.

Mate location and courtship

Males of many *Adelpha* species have been observed "perching"; perching is defined as males occupying a specific area and flying out to investigate passing butterflies in search of females (Scott, 1973, 1976). Perching behaviour is often practiced by species that are otherwise rarely encountered, and it supposedly serves to enable location of potential mates by females in species that occur at low population densities (Shields, 1967; Scott, 1970; Alcock, 1983). Perching males usually occur in small groups, and frequently engage in vigorous, upward spiralling flights with intruding males that approach within a certain distance. Such flights are common in butterflies and other insects that exhibit territorial behaviour, and have been suggested to be a method for males to assess their relative flight capabilities, which may be important in chasing and courting females that pass through the perching territory (Lederhouse, 1982; Alcock, 1983, 1987).

Perching males typically maintain one to several perches, where they wait from early morning to early afternoon, usually in bright sun. Perches may be up to 30m apart, but while an individual often flies from one perch to the next and back, I have never seen them move through a site as reported by DeVries (1987) in Costa Rica. On the contrary, I have found perching species to be typically highly localised, using the same bush for up to four consecutive years (*A. argentea*), and often not being encountered elsewhere within a site. High fidelity to a particular perching bush over several years has also been documented in several detailed studies of North American butterflies, and favoured perching bushes occur in areas visited most frequently by females (Lederhouse, 1982; Alcock, 1983).

Perching height varies from less than a meter above the ground (*A. cytherea*) to 15m (*A. leuceria*) and almost certainly higher, and while varying to some extent within species, there nevertheless appears to be a favored height range for each species. I have observed males perching in several areas, including open clearings or primary forest along rivers, forest edges and ridge-top light gaps. While some species occur only in one of these microhabitats (e.g., *A. shuara*, *A. hyas*, *A. argentea*, *A. serpa*, along rivers; *A. cocala*, *A. phylaca*, *A. mesentina*, *A. attica*, *A. plesaure*, *A. seriphia* on ridge tops and along forest edges), a small number may be found in both (e.g., *A. salmoneus*, *A. iphicleola*). The most species-rich perching sites typically consist of a large cleared area (up to 20m in width or diameter), surrounded by forest, with secondary growth bushes of varying heights dispersed around the edge and/or in the middle of the clearing. Along ridge-tops, the richest sites for *Adelpha* species (and other butterflies) tend to occur at local topographic high points, in common with other studies (Lederhouse, 1982), though this is not always the case, and availability of prominent perching bushes of varying heights may also be important. There are many common species for which there are no perching observations, and these probably perch high in undisturbed forest canopies; I recently observed for the first time males of *A. mesentina*, one of the most common forest *Adelpha*, perching in eastern Ecuador, in the canopy above a large, natural hill top light gap. Perching males rest on the tip of the leaf upperside, with the wings typically closed or almost so, and are very wary. Flight between perches is usually gliding, with the wings held angled slightly downwards, interspersed with short bursts of rapid wing beats.

Despite having observed perching males on numerous occasions, I have never observed courtship or copulation, and, with the exception of *A. bredowii* (see species account), know of no published observations on either of these activities (although pairs of both *A. radiata gilletella* and *A. hyas viracocha* have been captured *in copulo*). Females are probably quickly courted by males when entering a perching area, and mating probably occurs away from the perching site to avoid interference from other males.

Almost nothing is known about mate recognition, but the great variation in wing pattern between some subspecies, and the great similarity between many species, suggests that wing pattern must play only an initial part. This hypothesis is borne out by the possible hybrid specimens between the closely related but phenotypically very distinct species *A. mesentina* and *A. thesprotia,* and *A. cocala* and *A. irmina* (see Figs. 90c,d, 104e,f). Instead, mate recognition and courtship in *Adelpha* may be pheromonally mediated; male *Adelpha* have a dense area of darker scales at the base of the ventral forewing, in cell 2A-Cu$_2$, which is lacking in females, and although these scales are morphologically similar to typical wing scales, they may yet play a role in pheromone dissemination.

Mimicry

The close resemblance of the dorsal wing patterns of several *Adelpha* species, which proved to be unrelated when their early stages were examined, led Aiello (1984) to suggest that *Adelpha* were involved in mimicry. She tentatively proposed that species whose larvae fed on rubiaceous plants might form the unpalatable models for other species. Unfortunately, there is very little information available on the palatability of *Adelpha* species, as is the case with all neotropical butterflies. The experiments of Srygley & Chai (1990) demonstrated that 100% of individuals of *A. cytherea* and *A. serpa celerio,* the former a proposed model of Aiello (1984), were entirely consumed by caged jacamars, while more recently Pinheiro (1996) also found the few species that he tested to be palatable to kingbirds in Brazil. However, it is also worth noting that the study of Pinheiro (1996) failed to find evidence for unpalatability in classically unpalatable genera such as *Heliconius*. A possible alternative is that *Adelpha,* with their fast, unpredictable flight, are relatively unprofitable prey (Mallet & Singer, 1987). Gibson (1974, 1980) demonstrated that predators will learn to ignore prey that consistently escape from them, particularly brightly coloured prey, and pattern generalisation can lead to a benefit for other similarly appearing prey. Similar hypotheses have been advanced to explain mimicry in other palatable insects, such as between beetles and flies (Lindroth, 1971; Hespenheide, 1973). Nevertheless, *Adelpha* are not noticeably more rapidly flying than many other neotropical nymphalids, and indeed are mimicked by *Doxocopa* (Nymphalidae: Apaturinae), containing some of the most agile neotropical butterflies, while many other genera of the Limenitidini (e.g., the African *Pseudacraea*, the north American *Limenitis*) mimic unpalatable, slow-flying species such as *Acraea*, *Battus* and *Danaus*. In the case of north American *Limenitis*, one species that has historically been regarded as a classic example of a Batesian mimic has recently been shown to be unpalatable (Ritland & Brower, 1991).

Notwithstanding the lack of evidence on the benefits conferred by mimicry in *Adelpha*, there is little doubt that *Adelpha* species are involved in mimicry, in the sense that dorsal wing patterns have converged onto a common pattern, both with other *Adelpha* and with species from other butterfly families. This is apparent both at the level of subspecies, and also at the species level, as illustrated by an examination of Figs. 32-116, the order of which is based on a preliminary cladistic analysis of the genus (Willmott, 1999, in prep.) In addition, the simple, contrasting colour patterns of *Adelpha* dorsal wing surfaces are certainly not cryptic, particularly since *Adelpha* flight involves short bursts of wing beats and longer periods of gliding with the wings horizontal, and since many species rest (when not perching) with the wings open.

The *Adelpha* fauna of the Apure region in Venezuela, whence a number of new subspecies were recently described by Neild (1996), constitutes possibly the most compelling evidence for mimicry. No less than seven subspecies (*A. plesaure pseudomalea* [Fig. 55g,h], *A. cytherea nahua* [Fig. 67l,m], *A. capucinus gutierrezi* [Fig. 73i,j], *A. heraclea antonii* [Fig. 79e,f], *A. malea malea* [Fig. 81a,b], *A. phylaca joffrei* [Fig. 88e,f], and *A. cocala orellanae* [Fig. 101ij]) occurring only in this small region have independently evolved an orange band bordering and touching the distal edge of the white band on the dorsal hindwing, a pattern that occurs elsewhere in the neotropics only in one subspecies from the neighbouring Catatumbo region. Moreover, the female of *Doxocopa lavinia*, which closely resembles *Adelpha* throughout its range, also has the same hindwing pattern in this area (A. Neild, pers. comm.). Another strong example of independent convergence of a dorsal wing pattern is the narrowing of the white dorsal bands in a number of unrelated species that are superficially similar on the dorsal surface and which occur sympatrically in western Ecuador. Such species include *A. iphiclus*, *A. iphicleola*, *A. erotia* form “lerna”, *A. basiloides* and *A. barnesia*, and the recently described *Doxocopa linda carwa* (Lamas, 1999). The same *Adelpha* species all develop particularly broad white bands in the Rancho Grande region of northern Venezuela. There are numerous other examples of the close correspondence of ranges of subspecies in which the dorsal wing patterns change synchronously from one region to the next, discussed under each taxon. In a number of cases, similar wing patterns are derived from the fusion and modification of different wing pattern elements, indicating that they are clearly not homologous, such as in the species *A. naxia* and *A. iphiclus*. Mimicry of *Adelpha* also extends beyond the genus, and other sympatric butterfly species with very similar dorsal wing patterns to *Adelpha*, that co-vary throughout the neotropics, include the females of most *Doxocopa* species, and the riodinid *Synargis phliasus* (Cramer), which Hübner ([1819]) even included in the genus in his original description of *Adelpha*.

Accepting that mimicry is operating in *Adelpha* helps to explain the lack of known areas of hybridisation between a number of phenotypically distinct but closely allopatric populations (e.g., subspecies of *A. lycorias* and *A. ethelda*); narrow hybrid zones are expected as a result of strong selection by predators on either side of the zone of contact (Mallet & Barton, 1989; Mallet, 1993; Joron & Mallet, 1998). As in the closely related genus *Limenitis*, it is likely that certain prominent wing pattern elements are controlled by single genetic loci, allowing the opportunity for sharp shifts in wing pattern. In *Limenitis*, the presence or absence of the white postdiscal band on both wings is believed to be controlled by a single locus, with several possible modifier loci (Platt, 1975); it is surely not coincidence that many of the phenotypic shifts between *Adelpha* subspecies also involve modification of the postdiscal band. Significant phenotypic shifts promoted by mimicry may produce a type of post-mating reproductive isolation between forms, through increased selection by predators against hybrids with unfamiliar wing patterns (Joron & Mallet, 1998; Mallet & Joron, 1999). In addition, wing pattern may play some role in inter- and/or intrasexual interactions that could enhance reproductive isolation (see above) and promote speciation (Mallet & Joron, 1999).

In addition to extensive geographic wing pattern variation, several distinct mimetic assemblages of *Adelpha* may also occur together in a single locality. Diversity of mimicry rings in sympatry is characteristic of many other mimetic groups and is an interesting phenomenon (Beccaloni, 1997a; Joron & Mallet, 1998; Mallet & Joron, 1999), since Müllerian mimicry theory predicts that all species should converge onto a single pattern (Mallet & Gilbert, 1995). Traditionally, this variety of mimicry rings has been explained by each occupying a distinct microhabitat, either on horizontal or vertical scales, with associated suites of predators (Papageorgis, 1975; Mallet & Gilbert, 1995; Joron & Mallet, 1998). Mimicry rings in the nymphalid subfamily Ithomiinae are partitioned according to flight height, which correlates with hostplant height (Beccaloni, 1997b), and habitat disturbance (DeVries *et al*., 1999), which may also affect hostplant abundance, while members of the nymphalid genus *Heliconius* tend to nocturnally roost with other species in the same mimicry ring (Mallet & Gilbert, 1995). It is my experience that males of *Adelpha* species with similar dorsal wing patterns typically also perch in similar microhabitats; for example, in eastern Ecuador I have found *A. thoasa manilia*, *A. serpa diadochus*, *A. hyas hewitsoni* and *A. iphicleola thessalita* (comprising two distinct lineages) perching in a single river side clearing on the same bushes. "Orange and white banded" *Adelpha*, by contrast, have very few perching records, but their numerical abundance (pers. obs.) in traps in primary forest suggests that they perch in the canopy or subcanopy. Nonetheless, the pronounced phenotypic variation between subspecies, and dimorphism within subspecies, is a challenge to ecological explanations for diversity in mimicry rings, and it remains possible that mimetic diversity is maintained by rapid evolution of novel patterns, the genetic inability of taxa to converge onto a single wing pattern, or the lack of strong selective pressure to do so (Joron & Mallet, 1998; Mallet & Joron, 1999).

BIOGEOGRAPHY AND CONSERVATION

Patterns of Diversity

Spatial Patterns

The latitudinal gradient in regional species richness

Adelpha ranges from far northwestern USA (*ca.* 45°N) south to Uruguay (*ca.* 35°S), encompassing the entire neotropical realm, and while the majority of species are strictly continental, four species occur in the Greater Antilles, of which two are endemic. One of the most general and best known spatial patterns in biotic diversity is the increase in species numbers from higher to lower latitudes (Rhode, 1992, and references therein; Gaston & Williams, 1996). Interpolating ranges from latitudinal end-points (i.e., assuming species are continuously distributed between their northern and southern known latitudinal limits) produces a pattern of regional species diversity for *Adelpha* that peaks around the equator (Fig. 21). This diversity/latitude curve is notably asymmetric, southern latitudes retaining relatively high numbers, in comparison with corresponding northern latitudes, up to 35°S, south of which no *Adelpha* are known to occur (one species, *A. bredowii*, occurs to 45°N). Similar species richness asymmetries have been reported for New World spiders (Platnick, 1991) and mammals (Kaufman, 1995).

Explanations for the equatorial peak in species diversity are numerous and to date no consensus exists, probably because many factors combine to produce the pattern (Rohde, 1992). Recently, however, attention has been focussed onto the possibility that equatorial peaks are the simple result of random species distributions within a bounded area (Colwell & Hurtt, 1994; Willig & Lyons, 1998; Lees *et al.*, 1999; Colwell & Lees, 2000), which may owe little to environmental variables that correlate with latitude. While random distribution models do produce mid-point peaks in species diversity, a second prediction of these models, namely random distribution of range edges throughout the latitudinal range, is seldom tested. Plotting numbers of range edges within each 10° latitudinal band reveals a highly irregular pattern of variation in numbers of range edges in *Adelpha* (Fig. 21; Appendix E). Considering the null hypothesis that range edge distribution is random, it is possible to calculate the probability of obtaining a given number of range edges within any latitudinal zone, using simple probability theory. With 170 total range edges (north and south, for 85 species), and 14 latitudinal zones, there is a 99% probability that the numbers of range edges per latitudinal zone will lie between 3-24 inclusive, and a 95% probability that they will lie between 4-22 inclusive. In other words, the probability of a latitudinal zone having 3 or less, or 23 or more, range edges is less than 0.05, and the probability of 2 or less, or 25 or more, is less than 0.01. For *Adelpha*, we can reject the null hypothesis at a confidence level of 0.99, since latitudinal zones occur with 1, 25 and 28 range edges (Appendix E).

Variable sampling is a problem in any analyses of range edge density, but the strong correlation between the positions of range edge peaks and the limits of major biogeographic regions in *Adelpha* (indicated on Fig. 22) suggests that range position is not random but is constrained by geographical barriers. The only area where this appears not to be true is the Atlantic region. Here, there are no major geographical barriers to north or south range extension, and *Adelpha* distribution and abundance in this region is perhaps closer to predictions of the models of Brown *et al*. (1995) (see above under "Rarity"). The apparently non-random distribution of *Adelpha* range edges, at least throughout much of the generic range, suggests we should look elsewhere for an explanation for the equatorial peak in species diversity.

Fig. 21. Latitudinal gradient in regional species richness and range edge limits for all *Adelpha*.

Stevens (1989) proposed that a decrease in average latitudinal range of species towards the equator (Rapoport's rule) could help explain increased species richness, since a greater number of species would be near the edges of their ranges at the equator and therefore able to co-exist in otherwise marginal environments, sustained through continuing immigration from nearby source populations. In *Adelpha*, as in increasing numbers of other taxa (Gaston *et al*., 1998), there is no evidence either for a Rapoport effect or for a greater number of range edges at the Equator. In fact, there is a slight increase in average latitudinal range size towards the Equator, peaking between 5-10°S, due to the high endemism (and small latitudinal ranges) of montane species in central America and the Atlantic region, in contrast to the Andes and Amazon (5-10°S), wherein most species are uniformly distributed. Thus, Fig. 21 reveals a sharp decrease in density of range edges towards the Equator.

The now well-established relationship between area and species richness (Rohde, 1992; Gaston & Willams, 1996) has also been proposed to account for higher species richness at the equator, for a number of reasons (Rosenzweig & Sandlin, 1997; Lees *et al*., 1999; but see Kaufman, 1995; Rohde, 1999). However, this seems unlikely to account for broad patterns in *Adelpha*; arguing that the "tropical biome" is larger than temperate biomes (e.g., Rosenzweig & Sandlin, 1997) is irrelevant to explaining the equatorial peak in *Adelpha* diversity within the tropical biome. Furthermore, the latitudinal band with the largest area (5-10°S) does not contain the highest diversity (Fig. 21). The latitudinal pattern of species diversity in *Adelpha* appears to be heavily dependent on those biogeographic regions that are included within each latitudinal band. Thus, the south-skewed pattern of species diversity in *Adelpha* can be accounted for most simply by the presence of a rich and highly endemic Atlantic fauna between 15-35°S, and the absence of the diverse Andean fauna north of 10°N. This type of explanation also accounts for similar patterns in unrelated taxa (e.g., mammals (Kaufman, 1995)). Nevertheless, while number of biogeographic regions clearly exerts a strong effect on total species numbers within latitudinal bands, there also remains a clear increase in syntopic species richness within biogeographic regions towards the Equator, which is ultimately responsible for explaining the equatorial peak in diversity.

Gradients in community species richness

Community species richness in *Adelpha* peaks at the eastern foothills of the Andes, at the western edge of the Amazon basin. At several sites ranging from 450-600m elevation in the Tena area of eastern Ecuador, a total of 36 *Adelpha* species have been recorded, with a further three (two lowland - *A. amazona* and *A. barnesia*, and one lower montane - *A. zina*) predicted to occur. Whether a species is recorded at a site may largely be due to microhabitat differences which influence presence or absence of perching males; females of some species (e.g., *A. hyas*), virtually always rarer than males, have been recorded at sites where males are unknown, suggesting apparent differences between sites may be mostly sampling artifacts. Faunas with similar species richness are predicted to occur along the base of the Andes at least as far north as the Caquetá area of Colombia, and at least as far south as the Madre de Dios region of southern Peru, with only a slight decrease into Bolivia (Fig. 22). *Adelpha* faunas of sites further east into the Amazon basin are noticeably less diverse (e.g., 23 species recorded from Pebas, Peru, of a predicted 27; 14 species at Cacaulândia, Rondônia, Brazil, of a predicted 26; and 20 species from Pará, Brazil, of a predicted 22) (Fig. 22).

Measuring and estimating community species richness for *Adelpha* in other areas of the neotropics is complicated by lack of precise distributional data. For example, species with the specimen data "Chanchamayo" (Peru) range from *A. aricia*, which seldom, if ever, occurs below 1500m, to *A. messana*, unknown above 900m. Nevertheless, considering known distributions and elevational ranges, and areas that have been particularly well collected, allows some estimate of the species richness at elevations of around 300-600m, a similar elevation to the best sampled sites at the base of the eastern Andes. Central American and Atlantic sites are comparable in richness and significantly less diverse than sites at the base of the eastern Andes, although the majority of published species totals are markedly below those predicted to occur. Brown (1992) reports 14 species from the Serra do Japi, and Ecoforça (2000) list 11 for the Mata de Santa Genebra, near Campinas, even though both sites would be predicted to contain up to 30 species. Pooled museum specimen data for the Joinville and Rio de Janeiro areas give a better indication of the true potential species richness of these areas (Fig. 22). As discussed below, a variety of techniques are required to obtain an accurate inventory of *Adelpha* faunas, and such techniques appear to be seldom employed in biotic surveys. In addition, numbers of species reported in publications are likely to underestimate the true number recorded because of the problems of identifying similar species in this genus.

The three principal patterns are, therefore, broadly increasing community species richness with decreasing latitude over the whole neotropics, relative uniformity of species richness with latitude within the Amazon, and decrease in species richness from the Andes eastwards. Rohde (1992) discussed a large number of proposed explanations for increasing community species richness towards lower latitudes, and suggested that the most satisfying explanation was an increase in evolutionary rates due to higher ambient temperatures. Historical processes (discussed below) and area are also likely to have played a part in producing varying species richness between biogeographic regions at similar latitudes, such as that of the Amazon lowlands in comparison with the Transandean lowlands. The uniformity in species richness along the base of the Andes and north to south across the Amazon basin suggests that while latitude may impose an initial limit on community species richness, species subsequently disperse to extend their ranges until prevented from further expansion by sharp physical boundaries. Such boundaries include dry regions, mountains and sea, and typically also delimit major biogeographic zones (see below).

Of greatest interest is the peak in *Adelpha* species richness at the base of the Andes and its decline eastwards. Several studies have demonstrated similar patterns for overall butterfly species richness (Lamas, 1994; Robbins *et al*., 1996; Robbins & Opler, 1997), and the highest published list for butterflies in the world was compiled in the Parque Nacional del Manu, in southern Peru (Robbins *et al*., 1996; though higher totals are reported for Rondônia and Jaru, in southwestern Brazil (Brown, 1996a), and a similar diversity occurs at the base of the east Ecuadorian Andes (Willmott & Hall, in prep.)). Both Lamas (1983) and Brown (1984) explained high local species richness in Peru (Tambopata) and Brazil (Jaru), respectively, as a result of habitat heterogeneity, rich eutrophic soils giving high primary productivity, continual mild climatic disturbance, proximity to montane regions as a source of lower montane species, and location on the peripheries of postulated Pleistocene refugia (see also Brown, 1982b, 1987b). Brown (1984: 46) stated that he favoured these mostly ecological explanations over historical ones, believing that potential regional diversity would be "rarely if ever realised in local situations", and similar views were expressed by subsequent authors (Emmel & Austin, 1990). The contemporary, but by no means consensus, view on the effects of local (ecological) vs. regional (historical) processes on community species richness held that species interactions and a limited number of niches would limit total richness regardless of the regional species pool (Cornell & Lawton, 1992). Recently, however, it has been argued that regional processes typically dominate local processes in explaining community species richness (Lawton, 1999), and with slightly more data now available for butterflies, there is no reason to believe that any site along the base of the eastern Andes between Colombia and southern Peru, when extensively sampled, would not yield similar numbers of species. I suggest that the high species richness of sites within this region is almost entirely a product of the rich regional species pool – the absence of only 3 of the predicted 39 *Adelpha* species from the Tena area in eastern Ecuador, of which two are very rare and the third recorded close by, suggests that there is no significant difference between local and regional species richness. A deeper understanding of this high community species richness in *Adelpha*, though, requires examination of the effects of elevation on species richness, discussed below.

Fig. 22. The Neotropical region, indicating areas of lowland (normal type) and montane (italic type) species endemism and values for community species richness for selected sites in *Adelpha*. One possible selection of 40x40km sites to maximally represent all *Adelpha* taxa at least once is also illustrated (black boxes).

Elevational patterns

The elevational gradient in regional species richness

An analysis of the variation in *Adelpha* species richness with elevation was conducted for all species by assuming continuous elevational ranges and interpolating between maximum and minimum elevational records; data that are regarded as erroneous on the basis of the overwhelming majority of other records have been excluded. The results show that the lowest species richness occurs at the highest elevations, but also reveals a richness peak at around 700-1000m (Fig. 23); a remarkable 74 species (87% of the genus) are known from 700-800m. However, this peak in richness does not necessarily reflect community (single site) species richness since rates of regional species turnover (gamma diversity) might be higher at certain elevations (discussed further below, under "Endemism and origins of *Adelpha* faunas").

Gradients in community species richness in the Ecuadorian Andes

To examine the relationship between elevation and community species richness I compiled data for Ecuadorian species on both slopes of the Andes, thus eliminating possible effects of changing latitude and average diurnal temperature on elevational ranges. I have included only data collected by myself and my colleague Jason Hall, and by other reliable workers. Since eastern Ecuador does not extend to sea level, I have also relied on data from similar latitudes in Brazil (largely sites on the lower Amazon such as Óbidos and Pará) to more accurately represent the lower elevational limit of east Andean species (Fig. 24). The average elevational range for

Fig. 23. Elevational gradient in regional species richness for all *Adelpha*.

eastern slope species is 960m (n=44, standard deviation 290m), and that for western slope species is 790m (n=35, standard deviation 570m). The lower average range and higher standard deviation for the western slope is indicative of the poorer quality of the data in comparison with the eastern slope. The average elevational range increases significantly

Fig. 24. Elevational ranges for Ecuadorian *Adelpha* both east and west of the Andes.

with elevation on the eastern slope (ranges grouped into 250m intervals; Spearman rank correlation coefficient $r_s = 0.84$; $p=0.001$), following Steven's (1992) elevational extension of the Rapoport rule. However, I suggest that this correlation, and probably many similar correlations for other groups, is entirely an artifact of the reduction in species richness at higher elevations; the majority of species with large elevational ranges must occur at high elevations (as well as low elevations), by simple virtue of the fact that they have large ranges, so species with large ranges increasingly dominate the fauna at higher elevations. Elevational ranges still show a "Rapoport effect" when only those species that extend to sea level are included, in other words eliminating montane species, and partitioning the data into other discrete sets of species grouped by sharing the same lower elevational limit shows that for all sets the average elevational range increases with elevation, but at the lower limit the average is broadly similar for all sets. I conclude that there is no evidence that truly montane species have wider elevational ranges than lowland species. Artifacts of species richness may also explain why Rapoport effects in latitudinal range size are more often observed at higher latitudes (Gaston *et al.*, 1998), where richness gradients are steeper (e.g., Fig. 21).

The distribution of species richness with elevation in Ecuador is illustrated in Fig. 25. In common with the results for the entire genus, the lowest species richness occurs at the highest elevation, but two further results are of particular interest: the decrease in disparity between eastern and western slope species richness with elevation, as species richness declines, and the peak in richness at lower-middle elevations on both slopes.

The species richness of the extreme lowlands on the western slopes is certainly underestimated, as a number of species whose range extends to sea level throughout central America (e.g., *A. iphicleola*, *A. barnesia*, *A. heraclea*, *A. messana*) have not been recorded below 250m in Ecuador. Furthermore, another six species (*A. nea*, *A. paraena*, *A. paroeca*, *A. naxia*, *A. boreas*, *A. malea*) are predicted to occur in western Ecuador, of which four are lowland inhabitants. Were these additional eight species to be added to the lower elevations of the western slope line, it would assume a shape more similar to that of the eastern slope. Nevertheless, the predicted lowland species richness on the west (19 spp.) would still be below that predicted for the east (26, including *A. amazona* and *A. barnesia*), and this is a pattern reflected in virtually all butterfly taxa (Willmott & Hall, unpub.). Since the majority of the Transandean region lies at higher latitudes than the Amazon basin, the explanation might be the same as that for the latitudinal species richness gradient. Alternatively, the much smaller land area of the Transandean region, in comparison with the Amazon, may be responsible for its lower species richness. At higher elevations, species richness on the two slopes converges, since the montane faunas of both slopes are almost equal in richness, if the predicted *A. boreas* and *A. paroeca* are included within the western fauna. This result is somewhat unexpected, since butterfly diversity in virtually all other groups is markedly lower on the western slope than the east in montane habitats (Willmott & Hall, unpub.). A possible explanation might be that the west Andean montane fauna has elements derived both from the eastern Andes (particularly upper montane species, e.g., *A. corcyra*, *A. olynthia*, *A. justina*, *A. saundersii*), and also from montane areas in western Panama and Costa Rica (predominantly lower montane species, e.g., *A. salus*, *A. erymanthis*, *A. hesterbergi*, *A. leuceria*). To some extent this is also true of the lowland fauna, but the low endemism (see below) of the lowland Transandean fauna, and complete lack of lowland Chocó endemic *Adelpha*, do not result in so strong an effect as in the montane fauna. If this hypothesis is correct, then other taxonomic groups that are diverse in montane areas of western Panama and Costa Rica should also be relatively diverse in western Ecuador, in comparison with groups that are depauperate in central America.

Fig. 25. Elevational gradients in community species richness for Ecuadorian *Adelpha* on east and west Andean slopes.

Both slopes show an overall decrease in species richness with elevation, a relationship regarded as almost as axiomatic as the latitudinal gradient in species richness, and in fact, the two have often been assumed to be analagous (Stevens, 1992; but see Rahbek, 1995). However, while there is unanimous agreement that the highest elevations are less diverse than the lowest, as observed for all *Adelpha* and the Ecuadorian dataset, the intermediate pattern and underlying mechanisms have been the cause of controversy (McCoy, 1990; Rahbek, 1995, 1997). Two patterns have tended to emerge - a monotonic decrease in species richness with elevation (e.g., Terborgh, 1977; Lawton *et al.*, 1987; Wolda, 1987; Parsons, 1998; Patterson *et al.*, 1998), or a peak in species richness towards but not at the lower elevational limit, as observed in both *Adelpha* datasets (e.g., Janzen, 1973; Janzen *et al.*, 1976; McCoy, 1990; Holloway *et al.*, 1990; Olson, 1994; Rahbek, 1995, 1997; Lees *et al.*, 1999). In many cases, apparent differences are reconcilable when the sampling method, elevational range and taxon are considered. McCoy (1990) suggested that length of sampling regime, with short term studies tending to produce mid-elevation peaks and long term studies producing monotonic declines, and habitat disturbance at lower elevations reducing species richness, could both account for differences between richness/elevation curves. Olson (1994) also gave short-term sampling as a possible source for his mid-elevation peak in neotropical leaf litter invertebrates, while Patterson *et al.* (1998) attributed their monotonically decreasing curve for Peruvian vertebrates to their extensive sampling at the lowest elevations. Conversely, apparent monotonic curves may just represent that portion of a hump-shaped curve (McCoy, 1990), or represent too coarse elevational sampling. For example, although Wolda (1987) found a monotonic decrease in species richness of insects with elevation in Costa Rica, the sampling elevations of 100m, 1000m, 1300m and 2200m are clearly insufficient to reveal any lower-middle elevation peak around 600-800m. In other cases, an ecologically or taxonomically limited group may show unusual patterns, such as the peak in richness at high elevations for pronophiline satyrine butterflies in the Andes (e.g., Adams, 1985).

As far as these various possible confounding influences apply to the Ecuadorian dataset, unequal sampling time between elevations may be regarded as the most likely possible cause of artifactual patterns. However, unequal sampling is not unique to this study (e.g., Rahbek, 1997; Patterson *et al*., 1998), and equal sampling along an elevational gradient can also lead to spurious results, since per-species sampling effort will be lower in elevations with more diverse faunas. This has been suggested to produce artifactual elevational Rapoport effects (Colwell & Hurtt, 1994), in addition to mid-elevation peaks in species richness as discussed above (McCoy, 1990). Although I have spent the greatest amount of time sampling lower-middle elevations (see Figs. 26,27), I believe that this has had a negligible artifactual impact on the shape of the species richness curves. In fact, rather than equal time at each elevation, it would be better to standardise sampling between elevations by fixing the proportion of the fauna to be recorded, which could perhaps be estimated by species/time accumulation curves, but this methodology is more complex and cannot be planned in advance. Nevertheless, in a qualitative way I have attempted to do this in Ecuador, with the advantage of repeated visits to the country. It is therefore evident that despite many more hours being spent at lower elevations, these still remain under-sampled in comparison to upper elevations; approximately 100 hrs were required to collect half of the *Adelpha* species that I eventually recorded from 500-750m, whereas approximately 20 were required to record half the fauna at 1500-1750m. Thus, 427 hours on the eastern slope from 500-750m has produced only 87% of the species predicted to occur there based on ranges in neighbouring countries (39), whereas only 50 of the 80 hours spent between 1500-1750m were sufficient to record 100% of species known and predicted to occur there (15). The approximate 1:5 ratio in time spent between 500-750m and 1500-1750m, judged by continuous, qualitative assessment of new records made per visit, is nevertheless reassuringly similar to the 1:5 ratio in half lives for species/time accumulation curves, and therefore the ratio necessary to sample equal proportions of the fauna. The profile of the sampling time/elevation curve on the western slope is also broadly similar to that on the east.

Several other facts lead me to regard the lower-middle elevation peak in species richness of Ecuadorian *Adelpha* as reliable. Myself and J. Hall alone have spent more than 2400 person-hours over a period of 9 years, including all months except January, in the field in Ecuador, while data for the Amazon basin (the basis for records below 250m east of the Andes) are based on the efforts of numerous collectors over several centuries. The elevations sampled range from sea-level to 4000m, the latter 1000m above the upper elevational limit of the genus, with no elevational gap between sampling sites greater than 100m (east) or 200m (west, and that above 2000m). While it is obvious that a number of species on the western slope have wider elevational ranges than the known Ecuadorian range, in the majority of remaining species the Ecuadorian range encompasses the known range throughout the geographic distribution, reflecting the high quality of the Ecuadorian data. The high proportion of total predicted species recorded from Ecuador, based on known geographic ranges for all species (Appendix F), is further cause for confidence in the dataset.

Several mechanisms have been proposed to explain mid-elevation peaks in species richness, other than sampling artifacts. It has been suggested that random distribution of species range edges between "hard" boundaries can explain middle elevation peaks in species richness (Colwell & Hurtt, 1994; Rahbek, 1997), and this model was suggested by Lees *et al*. (1999) to best account for elevational patterns in species richness of various Madagascan taxa. However, unlike the study of Lees *et al*. (1999), and in common with many other studies, the peaks in species richness for Ecuadorian *Adelpha* do not occur at the middle of the elevational range, but towards the lower end. In addition, random distribution models' predictions of a middle elevation peak are also the same as would be expected, when ranges are interpolated, from simple sampling error - in this study, for example, a species does not have to be recorded at all middle elevations since its range is interpolated from known higher and lower elevational records, but all species must be recorded at sea-level. For this reason species richness is underestimated at lower elevations on the western slope in this analysis, but the enormous amount of historical collecting time spent in the Amazon basin, and the sharp decline in most montane *Adelpha* species several tens of kilometres east of the Andes, is a feature of this study that gives real confidence in the lower elevational limits of eastern slope species. Any decrease in individual abundance towards the edges of a species' range will further enhance this sampling error (Brown, 1984; Brown *et al*., 1995). Both of these artifacts may, at least partially, account for mid-elevation peaks in faunas with sharp lower elevational gradients.

Rahbek (1997) also found a peak in neotropical bird species richness at 500-1000m, after correcting for the effect of area on species richness. Although no such corrections have been made here, they would serve mainly to highlight still further the mid-elevation peak, with the reduction of eastern lowland species richness from the largest biogeographic region, the Amazon basin. Rahbek's results most closely matched his "hump-shaped" productivity model, which proposes that species richness falls with elevation due to decrease in primary productivity, with a decline in species richness at highest productivity (sea level) accounted for with several, not entirely satisfactory, *ad hoc* explanations (Abrams, 1995; Rahbek, 1997).

All explanations for change in species richness that are based on elevationally correlated (and hence continuous) variables, such as productivity, predict even gradients in frequency of species range edges with elevation. In contrast, models based on random distribution of ranges (Colwell & Hurtt, 1994) predict a random distribution of range edges. I therefore examined the distribution of range edges in Ecuadorian *Adelpha* by calculating the proportion of all recorded species with range edges within 250m intervals of elevation (edges falling on an interval boundary are included in the upper interval, if a lower elevational limit, and the lower interval, if an upper elevational limit). This type of analysis is able to differentiate between both appearance and disappearance of species, in contrast to many indices of faunal turnover (e.g., Magurran, 1988), and a similar analysis was conducted by Patterson *et al*. (1998) for Peruvian vertebrates. The results (Figs. 26,27) show that frequency of range edges is highly irregular, but since sampling intensity was not even along the elevational gradient, at least some of the patterns may be artifacts, and for this reason sampling time is also plotted on the same graphs. However, as discussed above, even equal sampling can lead to spurious patterns. Moreover, species/effort accumulation curves are unable to predict what species will occur within a zone and are therefore of no value in studies of species turnover. I have attempted to correct slightly for variation in sampling intensity by calculating proportions of species with range edges based on all species actually recorded within an elevational zone, rather than using interpolated elevational ranges. However, these results differ little from using interpolated ranges because the ratio of actual:interpolated records is high on both slopes (95% on the east, 86% on the west). If sampling time does contribute to peaks in range edge density, then peaks for both upper and lower range limits should be congruent and correlated with peaks in sampling time.

Fig. 26. Proportion of *Adelpha* fauna within each 250m elevational zone with elevational range edges in Ecuador east of the Andes (lower elevational limit for species extending below 200m based on Brazilian data at similar latitude – see text for details). The elevational variation in sampling time by myself and J. Hall is also indicated.

Fig. 27. Proportion of *Adelpha* fauna within each 250m elevational zone with elevational range edges in Ecuador west of the Andes. The elevational variation in sampling time by myself and J. Hall is also indicated.

Figure 27 shows that the peak of lower limits on the western slope at 750-1000m correlates with the peak in collecting time, although the local peak in upper limits occurs at 1000-1250m, while the trough for upper limits at 2000-2250m is a result of very few hours spent in that zone. On both slopes the proportional values at higher elevations become much more unreliable due to very low species numbers. However, upper and lower limit peaks do not correspond exactly with each other, on either slope, and do not correlate with the peak in collecting time on the eastern slope (where the data are most reliable), nor on the western slope at higher elevations. I therefore suggest that there are zones of significantly higher turnover on both slopes that are independent of sampling time. As a more reliable indication of zones that have high absolute turnover, Fig. 28 indicates elevational gradients in total numbers of range edges for both slopes.

Fig. 28. Numbers of *Adelpha* species elevational range edges within 250m elevational zones in Ecuador east and west of the Andes

These results suggest that *Adelpha* species are, at least to some extent, elevationally zoned, as Patterson *et al*. (1998) concluded following a study of elevational distribution in mammals along a gradient in southern Peru. Two relatively distinct faunas are apparent on both slopes, a lowland fauna, which has its upper limits peaking between 800-1200m, and a montane fauna, which has a lower elevational limit of 500-800m. In addition, there are slight local deviations in range edge density within the montane fauna, which hints at possible subdivisions within this fauna also; analysis of other taxa would be desirable to examine whether or not the lowland and montane zones really are discrete and whether there are any finer scale patterns. It thus seems very plausible that elevations at which species turnover is particularly high, particularly the transition zone between lowland and montane faunas around 500-1000m, might produce local peaks in species richness where faunas overlap (see Fig. 28). Rahbek (1997: 895) also suggested that the peak in neotropical bird species richness between 500-1000m might be “at least in part, due to its placement adjacent to the large source pool of the 0-500m zone and those above it”, an explanation also proposed by Holloway *et al*. (1990) for the peak in Lepidoptera species richness at 700m in Sulawesi, Indonesia. Abrams (1995: 2025, no. 4) suggested a similar reason for declines in species richness at higher productivities.

One test for the hypothesis that the lower-middle elevation peak in *Adelpha* species richness is due to overlap between lowland and montane faunas is to examine patterns in other groups of butterflies that essentially lack a montane fauna. The riodinid genus *Theope* is one suitable group; all known *Theope* larvae are myrmecophilous and their very low diversity in montane regions (only two of the 68 species occur exclusively in montane habitats) is presumed to reflect the sharp decrease in ant diversity at higher elevations (Janzen, 1973; Olmstead & Wood, 1990; Hall, 1999). If the lower-middle elevation peak is due to environmental variables, such as primary productivity, we would expect *Theope* diversity to be significantly greater at the base of the east Ecuadorian Andes than at sea level much further east. In fact, there is no evidence that this is the case; *Theope* community species richness at the base of the east Ecuadorian Andes at 600m (34 species) is essentially the same as it is near sea level in the Guianas (36 species) (Hall, 1999). Other butterfly genera that do have appreciable montane faunas (e.g., *Eunica*, Jenkins, 1990) are also significantly more diverse at the base of the Andes than they are in the lower Amazon. However, *Eunica*, like a number of other genera, but unlike *Adelpha*, does have a genuine upper Amazon lowland endemic fauna, which also contributes to high species richness at the base of the Andes. For such genera, Bush's (1994) model of climatically induced, faunal mixing may well help to explain upper Amazon diversity, but, nevertheless, overlap of lowland and premontane faunas probably contributes significantly to the peak in neotropical (and world) butterfly species richness in sites at the base of the eastern Andes (Lamas, 1994; Robbins *et al*., 1996; Robbins & Opler, 1997). Clearly, this hypothesis needs testing with multiple groups of butterfly (Willmott & Hall, in prep.) and other taxa that do or do not have significant montane faunas, but a possible explanation for some reported monotonic species richness curves in the literature may be that the study taxon lacks a significant montane element.

The elevational zones apparent for *Adelpha* distribution bear strong resemblance to zones defined for vegetation (reviewed in Webster, 1995), although Lieberman *et al*. (1996) recently reported no evidence of discrete floristic zones along an elevational transect in Costa Rica. However, I analysed the elevational variation in number of range edges of the 182 most common species that they reported (Lieberman *et al*., 1996), and there is clear evidence of zones of high and low turnover along the elevational gradient. A strong peak in number of upper elevational limits occurs at 750-1000m, with smaller peaks at 1500m and 2300m, while number of lower elevational limits also peaks at the lowest elevation, 750m and 1500m. Elevational zones similar to those that I propose for *Adelpha* have been suggested for other groups of Andean butterflies (Lamas, 1982), and the upper limit of the lowland *Adelpha* fauna (800-1200m) corresponds with the lower limit of Chapman's (1926) "subtropical zone" for birds and plants in eastern Ecuador. The elevational position of the peak in species richness is also fairly similar to that for neotropical birds found by Rahbek (1997: the 500-1000m zone), by Olson (1994) for neotropical leaf litter invertebrates (800m), and by Holloway *et al*. (1990) for Indonesian Lepidoptera (700m). Patterson *et al*. (1998) also found evidence for elevational zonation in some Peruvian vertebrate groups, notably birds, but concluded, like Terborgh (1977, 1985), that range edges of only a small proportion of birds were controlled by ecotones. If elevational zonation of organisms is initially controlled by vegetation zones, it might be expected that insect herbivores would more faithfully reflect patterns than more generalist groups higher up the food chain, and some expansion of range limits either side of ecotones also seems likely.

One possible explanation for elevational zonation in *Adelpha* might simply be historical, shared elevational preferences. In other words, a clade may have speciated within a lowland or montane region and all species occur at similar elevations since they share a common ancestor. Certainly this may account for a number of similar elevational ranges, such as those of the closely related species *A. justina* and *A. olynthia*, and the *A. phylaca* group and *A. serpa* group, but both of the latter groups also contain montane Andean species (*A. lycorias*, and *A. seriphia*, *A. hyas*, respectively). A preliminary cladistic analysis of the genus (Willmott, 1999, in prep.) shows that lowland and montane species occur in the majority of clades, and there is little evidence that all members of any clade exhibit more closely similar ranges than they do to other, more distantly related species. Figure 24 illustrates this graphically, since the order of species, from left (primitive) to right (derived), largely reflects the preliminary phylogenetic hypothesis.

I suggest that elevational zonation of vegetation may also be an important influence on elevational ranges in *Adelpha*, but the factors that cause such zones are surprisingly poorly researched. There is little agreement as to whether discrete vegetation zones actually exist, the exact limits of zones, how they should be defined, and terminology (see Webster, 1995). Much of this disagreement is no doubt due to the numerous locally varying factors that might potentially influence the genesis of vegetation zones. Environmental variables, particularly temperature and precipitation (Webster, 1995), presumably impose sharp initial gradients which could separate biotas, which then become more or less homogeneous as species become finely co-adapted to their ecological community. Thus, Webster (1995) suggested that interactions with elevationally zoned faunas could contribute to zonation in floras, implying that feedback between the two might stabilise zones. It is tempting to draw analogies between the possible homogeneity of certain elevational zones and rapid species turnover at others, and the even species richness throughout biogeographic regions, with high rates of turnover at certain latitudes (see preceding section). Although speculative given that several environmental variables do not vary in a similar manner along elevational and latitudinal gradients (Rahbek, 1995), both patterns suggest that environmental variables may control species richness on broad scales (Rohde, 1992), and that species may subsequently expand their ranges to produce more uneven, "stepped" patterns of variation in species richness. If similar processes do underlie general latitudinal and elevational patterns, then one difference between the two patterns in *Adelpha* is the lower-middle elevation peak in species richness; there is no corresponding lower-middle latitudinal peak. A possible explanation might be that physical barriers, such as mountain ranges or dry regions, might more effectively limit range expansion than the gradual variation in environment along elevational gradients, thus leading to less overlap of biotas. This hypothesis might be tested in areas where there are no substantial physical barriers between tropical and temperate regions (e.g, far eastern Asia), or conversely, by studying elevational gradients that do show very sharp environmental zonation, such as fog forests on the peaks of otherwise xeric coastal mountain ranges. However, it is obviously much easier for a species typical of one elevational zone to stray several hundred metres up or down a steep elevational gradient into an adjacent zone than it is to accomplish a comparable latitudinal journey of several hundred kilometers, and this may be the most plausible explanation for overlapping montane *Adelpha* faunas.

Endemism and origins of *Adelpha* faunas

Generic origins

As discussed above under Generic relationships, the sister taxon to *Adelpha* is unknown with certainty, but the most plausible candidates are several limentidines occurring in eastern Asia. Preliminary cladistic analyses of the genus indicate that the *A. alala* group is the most primitive (Willmott, 1999, in prep.), a group that also shares with Asian and palearctic limenitidines a hostplant association with the genus *Viburnum* (Caprifoliaceae), and the habit of making leaf shelters as larvae, both of which are otherwise unknown in *Adelpha* (see discussions above). The association with *Viburnum* has profound implications for the evolution of *Adelpha*, since *Viburnum* is of Laurasian origin and believed to have arrived in South America via North America (Gentry, 1982; Burnham & Graham, 1999). This strongly suggests that the ancestor of *Adelpha* also arrived via this route. An additional fact is of central importance: four Amazonian

Adelpha species, *A. attica, A. melona*, *A. radiata* and *A. fabricia*, occur west of the Andes only in the Chocó region, not extending west beyond the Isthmus of Panama. Such distributions for plants have been regarded as evidence of evolution in isolation within South America, separated from Central America by a sea barrier at the Isthmus of Panama (Gentry, 1982; Burnham & Graham, 1999). We are left, therefore, with something of a conundrum: the most primitive group in the genus occurs in South America only in high montane habitats and arrived via North America, between which there was a permanent land connection only since 3 million years ago. However, derived lowland species indicate an origin within South America prior to connection with North America. I consider five possible explanations for this interesting problem.

1. *Adelpha* is polyphyletic, with the *A. alala* group and remaining *Adelpha* being derived from different ancestral lineages. Given the absence of morphological structural characters unique to *Adelpha* it is difficult to be completely confident in discounting this possibility. Nevertheless, four wing pattern characters support the monophyly of *Adelpha*, and there is little reason to believe that they independently evolved twice in two lineages within the same biogeographic region. Additional, possibly molecular, data would be highly desirable to test the current phylogenetic hypothesis for *Adelpha* (Willmott, 1999, in prep.).

2. The ancestor of the *A. alala* group may have secondarily reverted to feeding on *Viburnum*. This seems possible, but it is not a parsimonious explanation, and it is probably untestable.

3. The ranges of *A. attica, A. melona*, *A. radiata* and *A. fabricia* are random and unrelated to a historical barrier, or poorly known and actually extend further west, or merely reflect those of their hostplants. All three of these are possible, but seem unlikely; coincidence of range limits of four species suggests a common cause, extensive historical collecting in western Panama has produced no records of these species, and the known hostplants are widely distributed. Furthermore, two subspecies hybrid zones also occur in central Panama (*A. paraena* and *A. cytherea*), suggesting some barrier to *Adelpha* dispersal (though it is possible that this barrier may be of more recent origin than the 3Ma sea barrier). However, regardless of the evidence for the presence of *Adelpha* in South America prior to 3Ma based on patterns of endemism, it is still difficult to imagine that the evolution of almost the entire genus occurred within 3Ma. Among *Heliconius* butterflies, the last 2Ma have principally seen differentiation at the subspecific level only (Brower, 1994).

4. The ancestor of the *A. alala* group reached South America prior to establishment of a permanent land connection at 3Ma. A chain of islands, some of which at least supported montane vegetation, probably existed between Central and South America from the late Miocene (10-5Ma), and some may even have provided a continuous connection for short periods of time (Burnham & Graham, 1999). This explanation is certainly possible; montane Lepidoptera groups in Sulawesi and New Guinea show strong affinities to the Himalayan fauna, despite no continuous land connection ever having existed, indicating high dispersal abilities even in montane species (Holloway, 1986). It is also just possible that both *Viburnum* and *Adelpha* reached South America long before the late Tertiary, along a postulated late Cretaceous proto-Antillean island arc (Donnelly, 1988). However, although the timing of the arrival of *Viburnum* in South America is uncertain due to a poor palynological record, there is little evidence for the arrival of other montane Laurasian plant taxa before the Pleistocene (Burnham & Graham, 1999).

5. The ancestor(s) of certain groups of *Adelpha*, or all *Adelpha* except the *A. alala* group, reached South America substantially before formation of the Isthmus of Panama, and subsequently speciated. The *A. alala* group colonised recently, following formation of a permanent land-bridge. This explanation, perhaps the most plausible, permits one or more species that could have been more dispersive, for example being habitat generalists with a broad host range, to be the ancestor(s) of the majority of the genus.

Areas of species endemism

The fact that range edges of a particular species very often show congruence with those of other species led early on to the recognition of areas of endemism (e.g., Wallace, 1876); regions with a characteristic biota which changed little across the area but significantly at its edges. Faunal transition zones represent areas of species replacement and/or loss, though only recently have attempts been made to distinguish these fundamentally different processes (Williams *et al*., 1999). Since allopatric speciation is widely accepted as at least the most common mechanism for speciation, understanding where and how populations become fragmented can lead to a deeper understanding of the processes underlying the evolution of taxonomic diversity, and these two topics will therefore be considered together. Figure 21 shows that there are certain latitudes where the frequency of *Adelpha* species range edges is low, and others where it is considerably higher.

Many *Adelpha* species are very widespread, occurring from Mexico to southeastern Brazil, and the limits of their ranges largely coincide with the limits of the neotropical forest biome, but a number of species are restricted to smaller areas (Table 2). Brown (1982b) recognised four major regions of species endemism for certain groups of lowland neotropical forest butterflies; Transandean (Mexico to northwestern South America, west of the Andes), Andean (both slopes of the Andes, from Venezuela to Bolivia), Amazonian (Amazon and Orinoco river basins and the Guianas), and Atlantic (eastern Brazil to southern Uruguay, Paraguay, and northern Argentina). These regions appear to correspond closely to areas of endemism in lowland *Adelpha* (see Fig. 22), but to investigate their validity for this genus I calculated an index of species turnover between pairs of regions using Whittaker's (1960) index of beta diversity: $\beta = S/\alpha - 1$, where S is the total number of species within two regions and α is the average number of species for both regions (see Magurran, 1988, for a review of different indices of beta diversity). I also calculated β values to compare montane regions of endemism. Partitioning faunas into lowland and montane classes may seem arbitrary, but within *Adelpha*, at least, there are very few species whose ranges are not clearly confined to mountainous regions or extend far into lowland areas (the only exceptions are *A. boeotia* and *A. delinita* – since both are common at high elevations in montane areas, in otherwise typically montane faunas, I have regarded them as montane). The situation is complicated slightly in central America, but here a consensus of elevational data and confinement to montane islands enable recognition of lowland or montane species. For the Atlantic region I do not have sufficient elevational data to separate *Adelpha* into classes, and the fauna has thus been considered as a single unit. In addition, in regions where there is a sharp elevational gradient down to sea level, such as the Atlantic, montane *Adelpha* may also occur to near sea level. (This fact does not invalidate recognition of montane and lowland classes; more important is the elevational pattern of abundance, and measurements of this would test the validity of recognising distinct montane and lowland classes.) Combining the Atlantic fauna under one class will, of course, affect calculations of beta diversity. To attempt to partially compensate for this effect, I subtracted species that are montane elsewhere in their range from the Atlantic fauna when making comparisons with other lowland faunas, and *vice versa* for species that are lowland elsewhere, but for the 11 endemic Atlantic species this was not possible.

The results for lowland faunas indicate similar values of beta diversity between the Transandean region and the Amazon, and the Amazon and Atlantic (Table 3). I also compared the Chocó region (western Panama to western Ecuador), which is high in endemism in other butterfly groups (e.g., Callaghan, 1985; Hall, 1999), with the remainder of central America, but the low value for β (0.14) argues for including it within the Transandean region. In fact, the Chocó contains no endemic lowland *Adelpha*, and the moderate β value in comparison with western central America is due to it containing several otherwise Amazonian species that do not extend further west.

Table 3. Faunal overlap and values for β between biogeographic regions at the species level. See text for definition of β.

LOWLAND	Transandean	Mex.-Pan.	Pan.-W. Ec.	Amazon	Atlantic*
Transandean	21 total	-	-	**β = 0.29**	β = 0.51
Mexico-Pan.	-	17 total	**β = 0.14**	β = 0.41	β = 0.56
Pan.-W. Ec.	-	16 shared	20 total	**β = 0.28**	β = 0.50
Amazon	17 shared	13 shared	17 shared	27 total	**β = 0.35**
Atlantic	12 shared	10 shared	12 shared	18 shared	28 total
Average between adjacent regions: 0.32 (with Transandean data)					

MONTANE	Mex.-Hond.	Nicar.-Pan.	W. Andes	E. Andes	Atlantic*
Mex.-Hond.	17 total	**β = 0.37**	β = 0.49	β = 0.74	β = 0.88
Nicar.-Pan.	11 shared	18 total	**β = 0.30**	β = 0.65	β = 0.88
W. Andes	10 shared	14 shared	22 total	**β = 0.45**	β = 0.89
E. Andes	5 shared	7 shared	12 shared	22 total	**β = 0.68**
Atlantic	2 shared	2 shared	2 shared	6 shared	16 total
Average between adjacent regions: 0.57 (includes lowest possible β for Atlantic/E. Andes); 0.38 (excl. Atlantic)					

*Atlantic totals are estimates, based on total of 34 species in region minus known montane species (i.e. those also occurring in Andes) for lowland calculations, and minus lowland species (i.e. those also occurring in Amazon basin) for montane calculations. Transandean region includes Mexico to western Ecuador. β values for adjacent regions are highlighted in bold type.

My recognition of distinct montane and lowland elements to the *Adelpha* fauna means that no comparison of faunal turnover is relevant between montane and lowland regions, since species are placed into one category or another. Additional data on relative abundance with elevation will no doubt demonstrate this to be an over-simplification, but I believe it is at least sufficient to reveal broad patterns. Tyler *et al*. (1994) retained Brown's (1979, 1982a) four regions of lowland species endemism for the family Papilionidae, which includes a number of montane species, and included montane areas of central America within the Transandean zone. However, analyses of individual regions of montane endemism in *Adelpha* demonstrate that central American montane areas have a species richness comparable with either Andean slope, and that the faunal differences between the Andean slopes (β = 0.45) are, surprisingly, greater than between the western Andes and Nicaragua-Panama (β = 0.30). For *Adelpha*, at least, it is therefore untenable to group the east and west Andes under one region without including all other montane areas also, and I therefore recognise each as a distinct area of endemism (Fig. 22). The β value between Atlantic and eastern Andes is very high, not entirely because of the possibility of included lowland species within the former. The number of Andean *Adelpha* that also occur in the Atlantic is so low, that even were these regarded as the only montane species in the latter region, β would still be 0.63. Montane Brazil has clearly been isolated for a longer time, or much more effectively, from the Andes than have other montane regions.

The values for β between adjacent regions of endemism range from 0.28-0.45, or greater. Comparison of widely separated pairs of areas within regions of endemism shows that β-diversity within these regions is considerably lower than between. For the Amazon region, there are only two species that occur in eastern Ecuador (when the predicted *A. barnesia* and *A. amazona* are included) that do not also occur in the Guianan-lower Amazon area, producing a value of β = 0.04. Table 3 gives the value of β = 0.14 for Mexico in comparison with the Chocó region, while β = 0.17 between the east Colombian and Bolivian Andes, and β within regions of endemism is significantly lower than between (Mann-Whitney *U*-test; p=0.02). Although these analyses are crude, they offer some support for the areas of endemism recognised here.

The majority of endemic regions are separated by clear geographic or environmental boundaries, including mountain ranges, sea, dry areas lacking forest, or lowland areas (between montane regions). The limits of endemic regions are thus usually defined by multiple coincident range edges. However, the boundary between the Amazon and Transandean faunas, and east and west Andean montane faunas, is complex and a broad transition zone exists in northwestern Venezuela. For lowland faunas, this is apparent in the mixed nature of the Apure region (base of the eastern slopes of the Cordillera de Mérida). Typically Amazonian species, such as *A. capucinus*, *A. plesaure* and *A. ximena*, occur together with Transandean taxa at the eastern limit of their range, such as *A. phylaca* and *A. serpa celerio*. Subspecies of widespread species may show phenotypic similarities with either Transandean (e.g., *A. cocala orellanae*) or Amazonian (e.g., *A. malea malea*) taxa. The montane fauna (Cordillera de Mérida and Sierra de Perijá in Venezuela, and Sierra Nevada de Santa Marta in Colombia) shows similar evidence of mixing between east and west Andean taxa. For example, *A. sichaeus* (E. Cordillera de Mérida, only), *A. irmina* and *A. lycorias lara* are all found elsewhere only east of the Andes, while *A. zina zina* and *A. ethelda zalmona* are otherwise known only from the west. (For this reason, the line dividing east and west Andes in Fig. 22) bifurcates at the northern tip of the Colombia Cordillera Occidental.) These patterns suggest a variety of barriers, including mountain ranges (the Sierra de Perijá and Cordillera de Mérida) and dry areas (the llanos plains extending from northeastern Colombia to the mouth of the Orinoco), which have acted as filters to *Adelpha* dispersal. For the purposes of my analyses of beta diversity, exceptional taxa that show minor incursions into otherwise homogenous biogeographic regions have been assigned to the region in which the overwhelming majority of their range occurs.

Brown (1982b) found 80% of species in mimetic butterfly groups that he studied were restricted to one of his four biogeographic regions (though this number may be artificially high due an over-split species taxonomy). In contrast, within *Adelpha* only 37 species (44%) are endemic to a single region. In terms of numbers of species, endemism is highest in the Atlantic region, with 11 species (32% of the fauna: *A. gavina*, *A. poltius*, *A. calliphane*, *A. mythra*, *A. falcipennis*, *A. syma*, *A. abia*, *A. zea*, *A. herbita*, *A. epizygis* and *A. atlantica*), though this result includes both lowland and montane species. The Caribbean region, renowned for its endemism in most taxa, also has a high proportion of its fauna endemic, even if *A. abyla* is regarded as conspecific with either *A. iphiclus* or *A. iphicleola*. Nevertheless, given the very low diversity of *Adelpha* in the Caribbean the result is less significant than the high endemism in richer continental faunas.

Areas of subspecies endemism and speciation in the lowlands

To what extent has isolation between populations either side of barriers separating principal biogeographic regions been responsible for speciation in *Adelpha*? Sister species that replace each other in different biogeographic regions, or overlap only in the vicinity of the transition zone, argue in favour of allopatric speciation, and possible examples include: *A. basiloides*/*A. plesaure*, *A. messana/A. phylaca*, *A. iphicleola/iphiclus/A. abyla*, *A. ethelda/A. epione* and *A. corcyra*/*A. tracta*/*A. pithys*. Speciation in allopatry may come about through vicariance (the separation of populations through formation of features such as mountain ranges or sea barriers), dispersal (separation of populations by the founding of a new population on the opposite side of an existing barrier), or extinction of an intermediate population, though separating these hypotheses is often difficult.

The Caribbean has been the focus of a large number of biogeographical studies due to the geographically isolated nature of its fauna (e.g., Woods, 1989), and in *Adelpha* it is possible to distinguish between dispersal or vicariance for two of the species occurring there. Both *A. fessonia lapitha* and *A. iphicleola iphimedia* are phenotypically most similar to northern Venezuelan or Colombian taxa, and since there is no evidence for a recent land connection between these areas and the Greater Antilles (Donnelly, 1988), this suggests that both have reached the Greater Antilles from northern South America by dispersal (Tyler *et al.* (1994) discuss evidence for dispersal between continental South America and the Greater Antilles, via the Lesser Antilles, in the papilionid *Battus polydamas*). To suggest the converse, that mainland populations arrived from the Caribbean, is less parsimonious, since both species are widespread with further subspecific differentiation in Central and South America (though *A. f. lapitha* has several probably primitive wing pattern characters). The origins of the remaining two Caribbean *Adelpha* are more obscure, but *A. abyla*, at least, is so similar to mainland *A. iphiclus* and *A. iphicleola* that dispersal also seems likely. Smith *et al.* (1994) regarded several Caribbean species as good examples of vicariants, largely on ecological grounds that suggested a poor ability to make or survive extensive voyages across open water. The remaining Caribbean *Adelpha*, *A. gelania*, while highly distinctive and probably also fairly primitive (Willmott, 1999, in prep.), shares with the remainder of the genus a strong flight and tendency to fly in open areas, providing little evidence that it too might not have arrived by dispersal. Nevertheless, if both *A. gelania* and *A. abyla* are presumed to have colonised by dispersal, their absence on remaining islands of the Greater Antilles is slightly unexpected.

On the mainland, probably the most prominent apparent barrier to butterfly dispersal is the Andes. The influence of this barrier on the evolution of *Adelpha* species, particularly montane faunas, is discussed in more detail below. On finer scales, within biogeographic regions, a number of other theories have been advanced to explain patterns of endemism and speciation in the neotropical lowlands, particularly the Amazon basin (Bush, 1994; Haffer, 1996). In *Adelpha*, as in other neotropical butterflies, these patterns of endemism are currently evident only at the subspecies level.

For widespread species, areas of subspecies endemism typically coincide with those of species endemism, discussed above. Thus, subspecies often extend with little phenotypic variation across several supposed centres of endemism (e.g., the entire Transandean region). However, there are a number of other regions of subspecies endemism that are much more restricted in area. Patterns of subspecies endemism in neotropical lowland forest butterflies have been exhaustively analysed for a much larger dataset than available here (Brown, 1979, 1982a,b), so I will confine comments to making comparisons with existing known patterns. Compared to the groups analysed by Brown (1979, 1982a,b), all of which are relatively slow-flying, unpalatable, predominantly forest understorey species, there are many fewer areas of endemism apparent in lowland *Adelpha* subspecies (Table 4; names of areas from Brown, 1982a), all of which are in peripheral areas of the neotropics. In some cases I have combined several adjacent areas of endemism (as defined by Brown, 1979), when there are no apparent faunal differences between them. The highest number of endemic subspecies occurs in the Apure region of northwestern Venezuela, which has seven, all of which belong to the same mimicry ring.

Table 4. Areas of subspecies endemism for *Adelpha*, with representative endemic taxa.

LOWLAND (32 subspecies, of 19 species)

Area of subspecies endemism	Endemic taxa	Total
Mexico-W. Panama	*nea sentia, paraena massilia, fessonia fessonia, cytherea marcia*	4
Chocó (broad sense) [1]	*radiata aiellae, paraena lecromi, melona deborah, attica hemileuca*	4
Chimborazo[2]	*serpa duiliae, iphiclus estrecha*	2
Rancho Grande/Catatumbo[3]	*fessonia cestus, malea ixia, erotia caphira*	3
Apure[4]	*plesaure pseudomalea, cytherea nahua, capucinus gutierrezi, heraclea antonii, malea malea, phylaca joffrei, cocala orellanae*	7
Sucre/Trinidad[5]	*plesaure symona, cytherea insularis, barnesia trinita, naxia hieronica*	4
Oyapock[6]	*radiata gilletella, thoasa calliphiclea*	2
Bahia[7]	*radiata myrlea, melona melona, cocala didia*	3
Rio de Janeiro[8]	*radiata radiata, melona pseudarete, cocala caninia*	3

MONTANE (34 subspecies, of 15 species)

Area of subspecies endemism	Endemic taxa	Total
Guatemala[9]	*diocles creton, ethelda* ssp. nov.	2
Chiriquí[10]	*diocles diocles, ethelda sophax, zina lacina*	3
West Colombia[11]	*paroeca pseudodonysa, ethelda eponina, lycorias wallisii, erymanthis adstricta, salus salus*	5
Pichincha[12]	*ethelda ethelda, lycorias spruceana, erymanthis fortunata, leucophthalma irminella, salus emmeli*	5
Central Colombia[13]	*ethelda zalmona, lycorias melanippe*	2
Mérida[14]	*seriphia pione, alala completa, corcyra corcyra*	3
Portuguesa[15]	*zina desousae, justina inesae*	2
Rancho Grande[16]	*seriphia seriphia, alala alala, zina pyrczi*	3
Sierra Nevada de Santa Marta	*seriphia egregia, corcyra salazari, zina inachia*	3
S. Peru-Bolivia	*seriphia therasia, aricia aricia, saundersii helepecki*	4
Guianan highlands	*ethelda galbao, boreas kayei*	2

1) E. Panama-N.W. Ecuador, Colombia W. of Cordillera Oriental; 2) W. Ecuador; 3) Venezuela, Cordillera de la Costa-Catatumbo basin; 4) eastern foothills of Cordillera de Mérida, Venezuela; 5) Trinidad and adjacent N.E. Venezuela; 6) Guianan lowlands; 7) E. Brazil from Bahia-Espírito Santo; 8) S.E. Brazil from Rio de Janeiro W. throughout Atlantic region; 9) Mexico-Honduras highlands; 10) Nicaragua-E. Panama highlands; 11) Cordillera Occidental and E. slopes Cordillera Central, N. of Popayán; 12) S.W. Colombia-W. Ecuador; 13) slopes of Magdalena valley; 14) N. tip Cordillera Oriental in Colombia-Cordillera de Mérida; 15) Sierra de Portuguesa, N. tip Cordillera de Mérida; 16) Cordillera de la Costa, Venezuela.

Brown's (1979) analyses were based on both lowland and lower montane species, and thus a number of his centres of endemism are in or near montane areas. However, it is evident that elevationally adjacent montane and lowland faunas do not necessarily show concordant spatial patterns of endemism. For example, several montane *Adelpha* subspecies are endemic to small areas of Colombian cordilleras, yet there is little differentiation in lowland taxa throughout the Chocó region (in its broader sense of eastern Panama to northwestern Ecuador, and Colombia west of the Cordillera Oriental). Some of Brown's centres were probably based mostly on montane taxa though, such as Chiriquí (Costa Rica to western Panama), and where applicable, I have followed his terminology (other names of areas are defined in the caption to Table 4). Seven of the montane endemic centres are clustered in northwestern South America, while the eastern Andes have only a single centre, in the south. The highest endemism occurs in the Pichincha and West Colombian centres, with five taxa each, though, unlike the lowland Apure region, only two can be considered co-mimetic in each case.

Delimitation of these areas of montane endemism for *Adelpha* has been done purely qualitatively and certainly greatly oversimplifies the situation. There is much evidence to suggest that lower and upper montane faunas will, like lower montane and lowland faunas, have discordant zones of endemism. For example, the Mérida zone contains only three, co-mimetic, upper montane species, which appear to occur on both slopes of the cordilleras. However, lower montane species show little overlap in subspecies between the eastern Cordillera de Mérida and western Cordillera Occidental in Colombia. Quantitative analyses of the ranges of many montane taxa are needed to gain an accurate description of zones of endemism in biogeographically complex regions such as the northern Andes, and such analyses would surely shed some light on the origins of montane faunas.

Observing concordance between subspecies range edges in multiple unrelated taxa of mimetic forest butterflies led Brown (1979, 1982a,b, 1987b) to follow Haffer (1969) in ascribing a historical origin to such patterns. Haffer (1969) proposed that arid Pleistocene climatic periods had caused forest to periodically contract into isolated "refugia", within which populations diverged in allopatry, a theory supported by the correlation between current centres of subspecies endemism and regions predicted to have supported moist forests in drier past periods (Brown, 1982a,b, 1987b; Tyler *et al*., 1994). However, coherence of ranges of mimetic subspecies with similar wing patterns is what Müllerian mimicry theory predicts, and therefore coincident ranges of co-mimetic taxa are not independent of each other (Turner & Mallet, 1996); for example, it cannot be chance that all of the subspecies of *Adelpha* endemic to the Apure region share the same dorsal wing pattern, yet subspecies of other species with markedly different wing patterns (e.g., *A. naxia*, *A. paraena*) also extend north into the Rancho Grande region. "Refuge theory" has also been criticised for the lack of statistical evidence for non-random distribution of range edges (e.g., Turner & Mallet, 1996), and alternative models have been proposed, which suggest that differentiation between populations may occur in parapatry across sharp environmental gradients (Endler, 1977, 1982; Mallet, 1993; Turner & Mallet, 1996; e.g., Jiggins *et al*., 1996). Certainly it is true that several centres of endemism evident in *Adelpha* are isolated by some prominent physical or environmental barrier from other centres, but there are also examples of transition zones within apparently homogenous habitat, such as Chocó/Chimborazo, Apure/Rancho Grande and Central Colombia/West Colombia/Pichincha. Congruence between transition zones in the absence of obvious environmental gradients for multiple unrelated taxa (e.g., Brown, 1987b), and concordance in area cladograms for those taxa (e.g., Cracraft & Prum, 1988), are the arguments most often presented in defence of a historical origin for centres of endemism. Nevertheless, it seems more than likely that many recognised centres of endemism owe their origin and maintenance to existing barriers to dispersal.

While refuge theory was initially proposed as a mechanism for speciation (Haffer, 1969), Brown (1979, 1982a,b, 1987b) continually stressed that, in butterflies, Pleistocene fragmentation of forests had played a role only in infraspecific differentiation. Nevertheless, similar processes operating over longer periods of evolutionary time, particularly at the periphery of ranges, could have been an important driving force for speciation in *Adelpha*. Peripheral populations are likely to fluctuate more in abundance and are more subject to occasional isolation and contraction, causing genetic bottlenecks and unusual local ecological conditions that might select in favour of novel genotypes (Mayr, 1963; e.g., Thomas *et al*., 1994). Such processes probably explain the concentration of centres of subspecies endemism in *Adelpha* around the periphery of the neotropics, and absence within the Amazon basin itself. Subspecies endemism is also highest in these centres in other groups of butterflies (e.g., Papilionidae; Tyler *et al*., 1994). Several species with restricted ranges occur at the edges of ranges of their sister species, such as *A. diazi* and *A. leucerioides*, both of which occur at the western edge of the ranges of *A. barnesia* and *A. leuceria*, respectively; judging by the phenotypic similarity within each pair of species, both represent examples of relatively recent divergence.

Evidence of similar patterns of narrowly endemic species around the peripheries of biogeographic regions recently led to a rather different interpretation of the roles of forest refuges in speciation of tropical birds (Fjeldså, 1995; Fjeldså & Lovett, 1997a,b; Fjeldså *et al*., 1997; Fjeldså *et al*., 1999). Based on an apparent correlation between centres of endemism for recent and relictual endemic bird species, Fjeldså (1995) proposed that areas of long-term stability promote evolution of new species as well as preservation of old. Thus, refuges are seen as areas of ecoclimatic stability (but not necessarily isolated forest fragments), usually in lower montane regions, that act as "species-pumps", producing species that subsequently disperse into lowland habitats, as well as providing refuges for species that become extinct over the remainder of their range (Fjeldså & Lovett, 1997a,b). In *Adelpha*, it is apparent that in the majority of pairs of closely related, possible sister species, with one member occurring in lower montane and one in lowland forest, it is the lowland species that retains the most plesiomorphic characters, such as a vertical forewing band and white hindwing band, suggesting that divergent selection may be higher in lower montane regions (e.g., *A. jordani*/*A. zina*; *A. cocala*/*A. irmina*; *A. mesentina*/*A. lycorias*). In addition, a mechanism is still required for speciation in almost exclusively lowland taxa, such as the riodinid genus *Theope* (Hall, 1999). In butterflies, at least, there does not appear to be any correlation between postulated centres of endemism and species richness (Brown, 1979, 1982a), while an alternative explanation for the apparent spatial correlation between ranges of young and old endemic species is suggested below.

Speciation in montane regions

Elevational gradients in endemism

The average value for β between lowland species biogeographic regions (0.32) is lower than that for montane regions (0.38), suggesting that rates of species turnover might be higher between montane than lowland regions, but there are too few data to test the statistical significance of this result. Endemism is another, qualitative, measure of beta diversity, and can be used to examine how species turnover varies with elevation. Plotting the number and proportion of species known from each elevation (at 100m intervals) that are endemic to a single biogeographic region (as defined in Table 2), reveals a significant increase in endemism with elevation (Fig. 29; p = 0.004; Spearman rank correlation coefficient r_s = 0.51). While only 23% of species occurring at sea level are confined to a single region, 60% of those at 2800m (3 out of 5 species) are endemic. Although lower numbers of species at higher elevations causes large fluctuations in proportional endemism, higher levels of endemism are still apparent even at 800-900m, where total and endemic *Adelpha* species richness peak. This broad increase in endemism accounts, at least partially, for the peak in total *Adelpha* species richness at lower-middle elevations (Fig. 23). This result differs notably from the pattern for neotropical birds, which do not apparently show any increase in endemism with elevation (Rahbek, 1997), but it might be expected considering the much greater isolation between montane regions in comparison to lowland regions (Peterson *et al*., 1993; Gentry, 1995).

Fig. 29. Elevational gradient in number and proportion of all *Adelpha* species endemic to a single biogeographic region.

Mechanisms for montane speciation

Several mechanisms are possible for geographic speciation in montane biotas, and Lynch (1986) discussed two general scenarios; the static scenario assumes colonisation of an existing montane area and subsequent speciation, while the dynamic scenario assumes contemporaneous uplift and speciation, associated with fluctuations in elevation of vegetation zones caused by climate changes. However, under both scenarios the principal mechanisms are similar, except for the unrealistic denial of past climatic fluctuations in the static model (e.g., Hooghiemstra & Van der Hammen, 1998). Chapman (1917) proposed that the montane bird fauna at a particular elevation in the Andes was the result of three possible processes: colonisation from adjacent lower elevations, invasion of species from higher latitudes with a similar climate, or invasion by species from adjacent montane areas. He suggested that latitudinal colonisation would dominate with increasing elevation, due to the decrease in time available for speciation from lower elevations. This hypothesis is in direct contrast to that of Fjeldså (1995), who suggests that montane areas are the source for lowland species (see above). A fourth mechanism for montane speciation is divergence of a clade within a single region. These four principal mechanisms, vertical colonisation, latitudinal colonisation, horizontal colonisation from similar life zones, or *in situ* evolution, produce different phylogeographic predictions that are testable (Table 5) (Willmott *et al*., in press), though few studies have attempted to do so. This is probably due to the lack of well-resolved phylogenetic hypotheses that contain all members of a clade, for which there are also distributional and elevational data. A further problem is that of post-speciation dispersal obscuring original geographic patterns of speciation (Chesser & Zink, 1994). For example, radiation within a biogeographic region (Mechanism 3) may occur initially in sympatry, parapatry or allopatry, but current sympatry of species may result from dispersal, whereas non-sympatry may result from subsequent extinction in part of the range (Chesser & Zink, 1994). Similarly, sister species currently sympatric in one region may have speciated allopatrically in different regions (Mechanism 4) followed by subsequent colonisation (e.g., *A. saundersii* and *A. lamasi* are sympatric in the west Andes, but not east, perhaps indicating subsequent colonisation of the western Andes by *saundersii*). Congruent ranges of species endemic to a single region thus offer the best evidence for Mechanism 4, but only one example occurs in montane *Adelpha* (Table 5). Despite these difficulties, replication of a certain pattern numerous times in closely related sister species provides support for the mechanism that predicts it (Chesser & Zink, 1994).

Table 5. Mechanisms for montane geographic speciation, with possible examples of *Adelpha*.

Mechanism for speciation	Predicted sister taxon distribution	Possible examples in *Adelpha*
1. Vertical speciation across elevational gradient (Chapman, 1917)	Sister taxon in adjacent upper or lower elevational zone	Lowland/lower montane: *viola/salmoneus*; *mesentina/lycorias*; *cocala/leucophthalma* and/or *irmina*; *iphiclus* or *iphicleola/thessalia*. Lower/upper montane: *coryneta/argentea*; *hyas/seriphia*, *irmina/saundersii*; *lamasi/saundersii* Lower and upper of lower montane: *jordani/zina*
2. Colonisation from higher latitudes and allo/parapatric speciation (Chapman, 1917)	Sister taxon at higher latitudes but lower elevations	None? Subspecies only, or primitive species.
3. *In situ* radiation (by sympatric, allopatric or parapatric mechanisms)	Sister taxon at same elevation within same montane biogeographic region	Congruent endemics: *pithys/donysa* Congruent non-endemics: *olynthia/justina* Non-congruent endemics: *shuara/coryneta* Non-congruent, non-endemics: *leuceria/leuceriodes*
4. Allopatric speciation (Chapman, 1917)	Sister taxon in neighbouring biogeographic montane region, at similar elevation	*corcyra/tracta/pithys*; *irmina/leucophthalma*; *ethelda/epione*; *rothschildi/stilesiana*; *milleri/zina*

Chapman's vertical speciation hypothesis is essentially that of differentiation across an environmental gradient, in this case caused by the elevational gradient (e.g., Endler, 1977). Since the most primitive clade in *Adelpha*, the *A. alala* group, is montane, as are many plausible generic sister taxa, the initial evolution of *Adelpha* may have followed a speciation event from montane to lowland habitats, or from temperate to tropical lowland habitats. However, the majority of extant montane *Adelpha* species appear to be relatively derived (Willmott, 1999, in prep.) and possible products of Chapman's vertical speciation mechanism. To test this mechanism, Bates & Zink (1994) derived a cladogram for the four species of the bird genus *Leptopogon*, whose members are elevationally stratified in the Andes. They found that the species occurring at the lowest elevation was the most primitive, with successively more derived species being found at higher elevations, and concluded this was evidence for speciation into the mountains from the lowlands. However, the phylogenetic hypothesis is equally consistent with the generic ancestor being a lower montane species, dividing to produce a lowland and lower montane species, then producing an upper montane species. Bates & Zink (1994) noted this problem, and were unable to resolve it since the sister taxon for *Leptopogon* was unknown. Patton & Smith (1992), however, found that Andean mice showed no lowland/montane sister group relationship, but instead, horizontally adjacent populations in the same elevational zone were sister taxa (Mechanism 3, with para/allopatric differentiation). Nevertheless, they admitted that this did not rule out an initial speciation event into the mountains from the lowlands.

In *Adelpha*, the poor resolution of the preliminary phylogeny (Willmott, 1999, in prep.) permits few tests of the importance of vertical speciation, but there are several examples where subspecific differentiation of a lowland species has occurred along the base of the Andes, such as *A. ximena ximena* and *A. ximena mossi*, and *A. thoasa thoasa* and *A. thoasa manilia*. In both of these cases, differentiation can be simply explained by “mimetic capture” by an alternative mimicry ring, in greater abundance at the base of the Andes due to the invasive presence of lower montane species. As discussed under “Mimicry” above, changes in mimetic pattern may promote speciation through natural selection against hybrids, causing an effective post-zygotic isolation (Mallet *et al.*, 1998), and may have caused increased speciation in such areas. It is therefore notable that many lower/upper elevation pairs of closely related species have markedly different dorsal wing patterns, such as *A. viola/A. salmoneus*, *A. jordani/A. zina*, *A. mesentina/A. lycorias* and *A. cocala/A. leucophthalma* and *A. irmina*. This is not always the case, however (e.g., *A. hyas/A. seriphia*, *A. iphiclus* or *iphicleola/A. thessalia*), but subspecific or specific changes in mimetic pattern between lowland and montane taxa is common in many other mimetic butterfly genera (e.g., *Callicore* (Biblidinae), *Heliconius* (Heliconiinae), *Hypothyris*, *Mechanitis*, *Melinaea* (Ithomiinae)). For whatever reason, speciation in *Adelpha* across elevational gradients seems to have been important, though the direction is not always possible to discern.

Considering Chapman’s second hypothesis, colonisation of montane habitats from higher latitudes, there are several examples of lower montane Andean *Adelpha* that extend into the lowlands in the south of the continent, such as *A. hyas*, *A. thessalia* and *A. lycorias* (possibly *A. boeotia* and *A. epione*, though I have insufficient data). Each of these may have originated in southern, cooler latitudes and migrated along the rising Andes into similar climatic zones, but there are no cases of sister species occurring at different elevations and latitudes. However, as mentioned above, the ancestor of the primitive *A. alala* group, which appears to have reached South America via North America, must have been formerly present in temperate latitudes and subsequently become extinct.

For Mechanism 3, radiation within a biogeographic region, there is less evidence in *Adelpha*, though the process may have been important. Certainly, there are several exclusively montane butterfly genera that are particularly diverse within the Andes (e.g., the nymphalid genera *Epiphile* and *Perisama* (Jenkins, 1986; Attal & Crosson du Cormier, 1996)) but not in other biogeographic regions, suggesting substantial speciation within a single region. In *Adelpha*, only *A. pithys* and *A. donysa* fulfill the criteria that species be largely sympatric and occur only in a single biogeographic region, thus arguing against allopatric speciation between montane regions (Mechanism 4). However, if the east and west Andes are combined for upper montane faunas (as other authors have done (Tyler *et al*., 1994), and possibly valid, given the higher overlap in west and east slope faunas at higher elevations; Fig. 30), *A. olynthia* and *A. justina* are perhaps examples of speciation within a single region. Only the east Andean region is sufficiently extensive to permit subspecific differentiation within montane *Adelpha* (and many other butterfly groups), evidence of divergence in parapatry (or meeting of formerly allopatric populations). Examination for patterns predicted by this mechanism in less dispersive butterflies (e.g., Ithomiinae) may uncover its role in montane speciation.

For the final mechanism, allopatric speciation between montane regions, there is abundant evidence in *Adelpha* (see Table 5). Chapman (1917), noting similarities between Andean and Central American montane bird faunas, proposed that mountain bridges, now eroded, had allowed migration between regions. Geological evidence does not support this hypothesis; instead, connections between montane regions almost certainly were established during cooler Pleistocene glacial periods when montane vegetational levels were lower than the present day (Van der Hammen, 1974; Adams, 1985; Hooghiemstra & Van der Hammen, 1998). The importance of this last mechanism in explaining the present day composition of montane faunas will be discussed further below.

Speciation in the Ecuadorian Andes and the origin of the Chocó fauna

As a case study for montane speciation in *Adelpha*, I examine the effects of the most extensive orogenic event of the late Tertiary on both lowland and montane *Adelpha* in the centre of generic diversity, the uplift of the northern Andes. Due to uncertainty concerning the arrival of ancestral *Adelpha* in South America, it is not clear whether or not *Adelpha* faunas evolved contemporaneously with uplift or colonised an existing mountain range, and I discuss evidence that supports or refutes either scenario. I focus on variation in patterns of faunal similarity with elevation between the east and west Andean slopes of Ecuador, the area for which I have the most precise and reliable elevational data, and also compare western Ecuador with the Costa Rica/west Panama fauna (the Transandean and Chiriquí biogeographic regions). These results can also be used to investigate whether the Chocó fauna of west Colombia and Ecuador represents separation of a formerly continuous lowland fauna by the Andean mountain chain (Chapman, 1917), or results largely from subsequent dispersal (Haffer, 1967; Gentry, 1988), in addition to Chapman’s mechanisms for montane speciation (Table 5).

I use the same elevational zones as for the species richness/elevation analysis, and calculate the proportion of species from each elevational zone shared with another biogeographic region. This reduces the effects of poorly known elevational ranges to the slope under analysis, since the proportion of species is unaffected by whether or not a species has been recorded in the corresponding elevational zone in the region under comparison. In contrast to many indices of beta diversity, a proportional measure distinguishes between differences in species richness and species replacement and provides more information about slope-specific patterns. Chapman (1917, 1926) proposed that the rise of the Andes would produce slope faunas with an increasing proportion of shared species from lower to higher elevations, since the latter have been isolated for a shorter period of time. He found that Ecuadorian bird faunas shared a larger proportion of all species, between east and west slopes, in montane habitats compared to the lowlands. This hypothesis implicitly assumes that the study taxon is present throughout the rise of the Andes. Figure 30 illustrates that in *Adelpha* this pattern may occur on the eastern slope, but certainly does not occur on the west, where the proportion of species shared with the east drops sharply at lower-middle elevations. However, the pattern on the east is affected by the apparent absence of five widely distributed species from western Ecuador, all of which are expected to occur there (*A. nea, A. paraena, A. naxia, A. malea, A. boreas*). Correcting for this sampling artifact by adding these species to the western slope, with their eastern slope elevational ranges, shows that the proportion of eastern species shared with the west remains fairly even over most of the elevational gradient for the eastern slope, and replicating Chapman's (1926) analysis shows that a smaller proportion of the montane fauna (46%) is common to both slopes than of the lowland fauna (67%). Thus, there are higher numbers of endemics in low-middle elevations than predicted by Chapman's hypothesis. The apparently low proportion of the western slope fauna that is shared with the east at highest elevations is largely artifactual, due to there being only a single endemic species at this elevation on the western slopes (*A. leucophthalma*), which is replaced on the east by the closely related *A. irmina*. Lowland western Ecuador shares no more species with the Chiriquí region than it does with the eastern Andes, but at around 1250-1500m there is a sudden, sharp decline in the proportion of west Andean species that are shared with the Chiriquí.

Fig. 30. Elevational gradient in proportion of *Adelpha* fauna shared between east Ecuadorian Andes, west Ecuadorian Andes and Costa Rica/west Panama. See text for details of calculations.

Four results are therefore of interest: low endemism in the west Andean lowlands in comparison with the eastern Andes, an unexpectedly low proportion of species shared between slopes at lower-middle elevations (more noticeable for the western slope fauna), more similar Andean faunas at higher elevations, and the sharp decrease in west Andean species shared with the Chiriquí above 1500m. Eight species occurring in the east Ecuadorian lowlands do not occur on the west, compared to two on the west that do not extend across into the Amazon. These faunal differences suggest that either the much greater area of the Amazon/Atlantic region, much of it in equatorial latitudes (see under "Species richness" above), has promoted higher levels of speciation (and, perhaps more importantly, lower levels of extinction) east of the Andes, or that the majority of lowland *Adelpha* species originated in the east and subsequently dispersed to the west, contrary to Chapman's hypothesis. Either of these scenarios implies extensive speciation of *Adelpha* within South America, and thus colonisation from North to South America relatively early in the evolutionary history of the genus. Dispersal around the northern tip of the Andes has been regarded as a much more important process than vicariance of an existing biota, in both birds (Haffer, 1967), and plants (Gentry, 1988), and virtually all west Ecuadorian butterflies are more closely related to north Colombian taxa than they are to east Ecuadorian taxa. It therefore seems much more likely that the Chocó *Adelpha* fauna represents dispersal around the northern Andes, with periodic isolation due to forest contraction during dry climatic periods, and due to marine transgressions along the base of the eastern Andes (Hooghiemstra & Van der Hammen, 1998; Burnham & Graham, 1999).

Four Amazonian species, *A. attica, A. melona*, *A. radiata* and *A. fabricia*, occur west of the Andes only in the Chocó region, not extending west beyond the Isthmus of Panama. It seems unlikely that these four species would have dispersed around the northern tip of the Andes as far south as western Ecuador, without extending at least into Costa Rica, unless South and Central America had been isolated at the time. Similar distributional patterns are interpreted as evidence of evolution in isolation within plant faunas (Gentry, 1992; Burnham & Graham, 1999), and also indicate arrival of *Adelpha* in South America prior to formation of the Isthmus of Panama.

If area or isolation effects have played a part in explaining the low numbers of lowland west Andean endemics, a similar pattern should be apparent for the west Andean middle elevation (750-1500m). When biogeographic region endemics are considered, the west does indeed have fewer endemic species than the east (Table 2). However, the western lower montane fauna is augmented by a number of lower montane Central American species that do not extend to the eastern Andes, apparent by the persistence of a relatively high proportion of west Andean species shared with the Chiriquí up to 1500m (Fig. 30). Such species presumably were able to disperse between the Andes and Central American montane areas during cooler climatic episodes when vegetation levels were depressed. At these times, however, the high Andean cordillera would have provided a barrier to dispersal to the eastern slopes. Dispersal from neighbouring montane areas has thus been important in determining the composition of the west Andean montane *Adelpha* fauna. In terms of Chapman's hypothesis that montane species were derived from local lowland faunas, there is little evidence that any of the west Andean lower montane endemics are derived from west Andean lowland species; rather, all appear to have other montane species as their closest relatives (see Species Accounts for *A. rothschildi*, *A. lamasi* and *A. levona*). This observation is in accord with the proposed dispersalist explanation for the origins of the lowland Chocó fauna.

On both Andean slopes, there is an increase in the proportion of shared species from middle (1000-1250m) to highest elevations. This is in accord with Chapman's vicariance hypothesis, but given that upper montane species often show clinal or subspecific variation around the northern Andes, the lower proportion of endemic species is presumably due to the greater possibilities for dispersal at higher elevations across low mountain passes in northern Colombia. The west and east Andean slopes are unrepresentative of other adjacent montane biogeographic regions, such as the western Andes and Chiriquí, which show a sharp decline in proportion of shared species above 1500m, thus producing the high elevation peak in endemism of Fig. 29. The reason for this sudden decline in shared species may be that the maximum estimated lowering of vegetational levels in Pleistocene glaciations is 1500m (Van der Hammen, 1974), and faunas above this elevation would therefore have had little chance of dispersal to neighbouring montane islands. This is certainly a hypothesis that could be easily tested with many other taxa.

To conclude, there seems to be little evidence that the Andean orogeny, as a vicariant event, contributed to speciation in either lowland or montane *Adelpha*. However, the barrier that it certainly represents to dispersal, particularly in combination with drier habitats at its northern margins in Venezuela and Colombia, has caused isolation between populations on either slope, and, in at least two cases, probably speciation (*A. plesaure/A. basiloides*; *A. irmina/leucophthalma*). Local endemic montane faunas show more relationships to other montane regions than they do to local lowland faunas. However, on a regional scale, there are a number of widespread montane species that seem to be most closely related to lowland species. This pattern suggests several initial speciation events from lowland into unoccupied montane habitats, followed by substantial differentiation of these montane species within and between isolated montane areas, producing the patterns of narrow endemism currently evident. This postulated sequence of events would be readily tested with a well-resolved, species-level phylogenetic hypothesis for a group that is diverse in lowland and montane regions, and there is evidence for a similar sequence in the nymphaline genus *Hypanartia* (Willmott *et al*., in press).

Effect of fluctuations in elevation of vegetation zones on speciation rates

In addition to restricting faunal overlap between isolated montane regions above 1500m, changes in elevation of montane vegetation zones could also have had important implications for rates of speciation. Bush (1994) proposed that, during cold past climatic periods, lower montane faunas and floras would migrate down from east Andean slopes into the upper Amazon basin, to mingle with the lowland biota. He suggested that lowland species would be forced to compete with cold-tolerant invading species, causing local extinctions and disruption of ranges, leading to greater opportunities for speciation in allopatry. Presumably, the same would be true, to a lesser extent, for the invading montane species, as they encountered novel habitats in which they may or may not have been able to survive. Although the palaeoecological data have been disputed, it also seems possible that lowland forest habitats would have been subject to mild to extreme fragmentation, placing additional evolutionary pressures on their constituent faunas and floras (Hooghiemstra & Van der Hammen, 1998). Bush's hypothesis is appealing in that it accounts for high lowland species richness in the upper Amazon (not so apparent in *Adelpha*, but evident in some other butterfly groups (Jenkins, 1990; Tyler *et al*., 1994)) and in the foothills of the Andes, in addition to the high numbers of endemic species in lower montane regions (see Fig. 29).

The second implication of Bush's (1994) hypothesis, which he did not mention, is that relative speciation rates for a given taxon should be markedly lower in montane zones (above 1500m) or temperate regions that never came into contact with lowland regions. A number of primitive *Adelpha* species occur only in upper montane forests (e.g., the *A. alala* group, *A. diocles*) or more temperate regions (e.g., *A. bredowii*, *A. herbita*, *A. zea*). Other examples among butterflies include the "tailed", primitive members of the papilionid genus *Parides*, which occur in western Central America and the Atlantic region, with a single, isolated species in the high Andes of southern Ecuador and northern Peru (Tyler *et al*., 1994), the monotypic riodinid subfamilies Styginae and Corachiinae, both confined to cloud forest habitats (see Harvey, 1987), the primitive Mexican swallowtails *Baronia brevicornis* and *Pterourus esperanza* (see Tyler *et al*., 1994), and several genera of Ithomiinae (Fox, 1940; Lamas, 1982). It is also noteworthy that a sharp floristic boundary occurs at around 1500m, above which Laurasian (temperate) lineages dominate (Gentry, 1995). One result of this elevational association of stable and unstable habitats is the apparent co-occurrence, at coarse scales, of young and relict endemic species, as noted by Fjeldså (1995). Yet, very different processes may be responsible for the occurrence of these two groups in montane regions. It would be very interesting to examine distributions of other taxa along elevational gradients to test whether primitive taxa occur at similar or higher elevations to recently derived endemics.

Conservation

It hardly needs saying that the conservation of biodiversity is of great current concern. Debate focuses particularly on how to measure biodiversity and on the most efficient means of conserving it (Williams & Humphries, 1996). The species is the most widespread unit in comparative measures of biodiversity, being regarded as conceptually simple and the unit for which the most information is available (Gaston, 1996; Claridge *et al*., 1997; e.g., Caldecott *et al*., 1996). However, recently attempts have been made to provide some measure of the contribution of different species to total genetic diversity (Vane-Wright *et al*., 1991; Faith, 1992; Williams & Humphries, 1996). The majority of such measures tend to value, in conservation terms, primitive, isolated species with few close relatives more highly than derived species with many close relatives (Vane-Wright *et al*., 1991; Williams & Humphries, 1996). Assigning biodiversity value to species (or other taxa) is generally based on phylogenetic estimates of the group in question, but since such estimates are available for only a fraction of groups, they are rarely, if ever, applied in practice. Since the cladogram for *Adelpha* (Willmott, 1999, in prep.) lacks fine resolution in a number of clades, no attempt will be made here to explicitly assign "weight" to species, but the broad phylogenetic position of species will be referred to in the following discussion, where relevant.

In practice, conservation of butterflies is generally conducted on two levels: that of the fauna, and that of the species, subspecies or even population (New *et al*., 1995). The former approach, more theoretically efficient and enormously more cost-effective, predominates in tropical countries, while the latter approach, with its associated high labour and financial costs, is popular in temperate countries (New *et al*., 1995; e.g., Emmel & Garraway, 1990; Emmel, 1995; Pullin, 1995). However, single taxon efforts are valuable for generating public support for conservation, and usually involve incidental preservation of habitats containing many other unrelated taxa under threat (Brown, 1991; New *et al*., 1995). Since butterflies are one of the few insect groups that is attractive to the general public, as well as a potential indicator of biodiversity, both of the above approaches to conservation are justifiable. Conservation of *Adelpha* will therefore be considered on the basis of individual species and faunas.

Conservation status of Adelpha *species*

Collins and Morris (1985) presented the first explicit attempt to identify threat categories for neotropical butterflies, but considered only the family Papilionidae. Their categories of threat were largely qualitative, and in an attempt to make category assignment more objective, Mace & Lande (1991) introduced a new system based on a quantitative assessment of the probability of extinction within a fixed time period. This system, after some refinement, became adopted by the IUCN for assessing threat to taxa (IUCN, 1996). Although recognised as difficult to apply in many cases, the system offers a variety of alternative means of assessing threat, and the IUCN (1996: appendix) state: "in many cases great care should be exercised in choosing between DD [Data Deficient] and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified". Brown (1991, 1996b) listed a number of Brazilian butterfly species regarded as actually or potentially threatened, some of which are widespread and locally common (e.g., the papilionid *Parides pizarro*, known from at least eight separate localities in eastern Ecuador alone (Willmott & Hall, unpub.)), but included no *Adelpha*, presumably because of lack of information. For butterflies, and indeed most invertebrate groups, lack of data means that there is a hidden level of taxa whose conservation status is higher yet than any taxa currently listed, but, ironically, since they are so rare and/or restricted in range, they remain unnoticed or impossible to list under current criteria. The converse is that many "rare" butterfly species are merely rarely collected due to behavioural traits, and intensive collecting, even in well-sampled areas, may reveal species to be vastly more widespread than formerly realised (*A. radiata* is a perfect example). Nevertheless, I still feel that sufficient data are available to make some cautious assessments of the conservation status of certain *Adelpha*.

Adelpha herbita: no populations are known of this species and neither is the precise collection locality of the holotype, though the latter is suggested here to be in the mountains of Santa Catharina (see Species Accounts). Hill tops in this region should be sampled using hand-netting and trapping to attempt to locate the species and determine its true geographic range. The species is of particular importance given its apparent phylogenetic distinctiveness (Willmott, 1999, in prep.). Given that the extent of montane habitat in Santa Catharina is probably less than 5000 km^2, that the species is known only from a single specimen and has not been seen for nearly a century, and that habitat loss in the Atlantic region is severe, I suggest that this species should be regarded as Endangered (in terms of the IUCN (1996) system, EN B1+2c).

Adelpha atlantica: despite occurring in the heavily collected region near Rio de Janeiro, this species is evidently very rare. Since it has been recorded near sea level its range may extend throughout the centre of the Atlantic region, and it should be sought in primary forest using traps baited with rotting carrion. Extensive habitat destruction may pose a threat to the species (Dinerstein *et al*., 1995; Biodiversity Support Program *et al*., 1995), but given the relatively recent collection of the two known specimens, and possibility of a wider range, I suggest it should be regarded as Vulnerable (VU B1+2c).

Adelpha gelania: although this species is apparently locally not uncommon, its limited, insular range in a region suffering extreme rates of habitat degradation, and its phylogenetic distinctiveness (Willmott, 1999, in prep.), makes it of some conservation concern. In addition, its range lies within a region that suffers extensive hurricane damage, which poses a threat to small populations already reduced by human activity (Emmel, 1995). However, it seems to be widespread and not uncommon throughout Hispaniola and Puerto Rico, and has a broad elevational range (Schwartz, 1989b). It should probably be monitored but not treated as currently threatened.

Adelpha abyla: this species is endemic to Jamaica, where habitat destruction poses a threat, as it does to the better known *Papilio homerus* (e.g., Emmel & Garraway, 1990). However, the species appears to be common, and is very closely related to, if not conspecific with, either of the widespread continental species *A. iphicleola* and *A. iphiclus*. Its status should be monitored but there currently appears relatively little cause for concern.

Adelpha diazi: this recently described species is known only from a small area in central western Mexico, where it appears to be uncommon. Nothing is known of its biology. Given the destruction of natural habitat throughout its small range, efforts to establish its true distribution would be useful.

Adelpha stilesiana: this is another recently described species, which is restricted to the Talamanca massif in central Costa Rica and extreme western Panama. The small range with its high historical levels of deforestation, and the evident rarity of the species which appears to occur only in intact cloud forest habitats, give some cause for concern, alleviated by its almost undoubted presence in two large national parks, Parque Braulio Carillo and Parque Amistad.

Adelpha rothschildi, *Adelpha lamasi*, *Adelpha levona*: these three species are restricted to very wet primary cloud forest habitats on the Pacific slope of the Cordillera Occidental in Colombia and extreme northwestern Ecuador. All three have relatively narrow elevational ranges and for similar reasons to *A. stilesiana* might be of some concern, although several protected areas occur within their ranges (e.g., Reserva Ecológica Cotocachi-Cayapas in western Ecuador)

Adelpha shuara: this species is known from a small area in the east Andean foothills of central Ecuador to extreme southern Colombia. Although individuals are locally common, populations may be dependent on small scale disturbances within primary forest along rivers, where males perch, and the propensity for human colonisation of river valleys in the elevational range of this species, 600-1300m, suggests that it may be under some threat from increasing population pressure. The species should be sought in northern Peru and further north in Colombia to establish its true range.

When subspecies are considered, the picture is naturally considerably more bleak than for species. Theoretically, subspecies may possess greater genetic and ecological differences than sympatric species, which need only differ by a single character that ensures reproductive isolation or reduction in hybrid fitness. A total of 83 taxa are represented by fewer than 25 specimens each in the collections that I examined, and eight of these are known from a single specimen (*A. herbita*, *A. justina inesae*, *A. justina maira*, *A. zina desousai*, *A. salus emmeli*, *A. thoasa calliphiclea*, *A. radiata romeroi* and *A. radiata explicator*). Although the conservation of single subspecies is widely practiced in temperate countries (e.g., Pullin, 1995), it seems something of a luxury in the neotropics, and the state of our knowledge of *Adelpha* distribution is not sufficiently advanced to merit further discussion of the topic.

Faunal analyses

With limited resources and time, the prioritisation of biotas for conservation has become an active field of research, and a number of criteria have been proposed to identify areas most deserving of immediate attention. Mittermeier (1988) introduced the idea of "megadiversity" countries, those that contained disproportionately high numbers of species in many biological groups, and suggested that they were particularly important for conservation. Recorded and estimated numbers of *Adelpha* species and taxa for all countries within the generic range are given in Appendix F. Currently unrecorded taxa are predicted either through interpolation of a known range spanning either side of a country (in areas such as the Andes and Central America), or through examination of the ranges of more common species known to be sympatric in similar habitats, similar elevations and biogeographic regions. Clearly, expected taxa will be underestimated for all countries at the periphery of biogeographic regions, since the first criterion is not possible to apply, and these countries include Mexico, Venezuela, Ecuador (west), Bolivia and Uruguay. The countries with the most complete faunal knowledge, excluding island areas and countries with very low species diversity, are Mexico, Costa Rica, Panama, Ecuador, Peru, Bolivia and Brazil. Countries whose fauna is particularly poorly known include most Central American countries between Mexico and Costa Rica, the Guianas and Uruguay.

Although Ecuador has the highest recorded species total of any country (56 species), this is due to extensive sampling there during the course of my research by myself and Jason Hall. Both Colombia and Ecuador are predicted to contain 60 species, or 71% of the genus, and it is possible that an additional species (*A. fessonia*) may be found in the isolated dry forests of southwestern Ecuador, which support other dry forest species with disjunct ranges (Willmott & Hall, unpubl.). Both Colombia and Ecuador, the two countries with the highest predicted numbers of *Adelpha* species, are among the 12 "megadiversity" countries (Mittermeier, 1988; Mittermeier *et al*., 1999). Peru and Brazil, often cited as the world's most diverse countries for butterflies (Brown, 1991, 1996a), have significantly less diverse *Adelpha* faunas, with predicted totals of 48 and 45 species, respectively (see also Hall, 1999).

Since the taxonomic status of allopatric *Adelpha* populations is, to some extent, arbitrary, and the concept of biodiversity encompasses not only species richness, but also their genetic diversity (Williams & Humphries, 1996), an analysis of the distribution of *Adelpha* taxa richness was conducted in a similar manner to species. Again, Colombia proves to be clearly the most diverse country in terms of taxa, with a predicted total of 112 (54% of the genus), followed by Ecuador with a predicted total of 82 (40% of the genus). Of interest is the high number predicted for Venezuela, whose butterfly fauna is seldom considered remarkable by neotropical standards (e.g., Brown, 1991, 1996a), which ranks third with 76 (37% of the genus). The reason for the high species and taxa diversity of Venezuela, Colombia and Ecuador is clear; all three countries contain faunas derived from four biogeographic regions (Transandean, west Andes, east Andes and Amazon), while countries such as Peru, Bolivia and Brazil span only two regions (east Andes and Amazon, and Amazon and Atlantic, respectively). Even the high endemism of the Brazilian Atlantic region (11 species) does not compensate for the combined richness of Andean and Transandean faunas.

Taxon richness is one method for ranking areas, but may be inefficient at representing taxa if there is high faunal overlap between the richest countries. Incorporating ideas of faunal complementarity, Ackery & Vane-Wright (1984), and later Collins & Morris (1985), introduced a "critical faunas analysis" which attempted to rank countries in order of their maximum cumulative contribution to representing all taxa in a given group. Both Collins & Morris (1985) and Hall (1999) conducted this type of analysis for butterfly groups in the neotropics, using swallowtails (Papilionidae) and riodinids of the genus *Theope*, respectively. Despite the obvious ecological differences between these two groups similar country rankings were obtained, and those rankings were also similar to those obtained here from analysis of *Adelpha* (Table 6). These similarities suggest that, at broad scales and at the level of species, groups of butterflies may exhibit substantial congruence in spatial patterns of endemism in tropical regions.

Table 6. Critical faunas analysis for *Adelpha* species and taxa by country.

SPECIES

Country	A	B	C	D
Brazil	4	40	44	44
Mexico	2	17	19	63
Jamaica	1	0	1	64
Ecuador	0	15	15	79
Panama/C. Rica	0	3	3	82
Peru	0	2	2	84
D. Republ./P. Rico	0	1	1	85

RECORDED TAXA

Country	A	B	C	D
Venezuela	17	50	67	67
Brazil	15	22	37	104
Colombia	11	30	41	145
Ecuador	7	3	10	155
Mexico	5	21	26	181
Trinidad	4	0	4	185
Panama	2	6	8	193
Peru	2	5	7	200
Dominican Republic	1	1	2	202
French Guiana	1	0	1	203
Surinam	1	0	1	204
Jamaica	1	0	1	205
Cuba	1	0	1	206
Dom. Rep./P. Rico	1	0	1	207
Honduras/El Salvad.	0	1	1	208

PREDICTED TAXA

Country	A	B	C	D
Brazil	11	52	63	63
Colombia	10	75	85	148
Venezuela	7	2	9	157
Trinidad	4	0	4	161
Mexico	3	23	26	187
Peru	1	8	8	195
Panama	1	6	7	202
Ecuador	1	0	1	203
Jamaica	1	0	1	204
Puerto Rico	1	0	1	205
Cuba	1	0	1	206
Dominican Rep./Haiti	0	2	2	208
El Salvad./Honduras	0	1	1	209

CODES:
A - Endemic taxa
B - Non-endemics not in previous countries
C - Total newly added taxa (A+B)
D - Cumulative number of taxa included

While analyses at the scale of countries are still influential in terms of the allocation and management of resources for biodiversity conservation (Mittermeier, 1988; McNeely *et al*., 1990; Bibby *et al*., 1992; IUCN, 1996; Caldecott *et al*., 1996; Mittermeier *et al*., 1999), understanding patterns at finer spatial scales is more relevant to the siting of protected areas. At this scale three main approaches have been advocated (Williams *et al*., 1996): ranking of areas on the basis of species richness (e.g., Prendergast *et al*., 1993), on the basis of numbers of "rare" species (either in terms of geographic range or population density) (Bibby *et al*., 1992; Poulsen & Krabbe, 1997), or on the grounds of faunal complementarity (Ackery & Vane-Wright, 1984; Howard *et al*., 1998). Furthermore, Myers (1988, 1990) attempted to identify areas that showed a combination of these characteristics, namely high species richness, endemism, and threat. It is obvious that at very fine spatial scales (e.g., sites several kilometers apart) species richness will prove to be a very poor criterion for ranking sites if maximally representing taxa is the goal, since faunas of nearby sites are likely to be highly similar. Unsurprisingly, therefore, the complementary areas approach has been shown to be the most efficient at representing all taxa at scales below that of the ranges of the majority of taxa under analysis (Williams *et al*., 1996). A more appropriate scale for comparison of richness vs. complementarity methods is that of the biogeographic region. Ranking such regions for *Adelpha* on the basis of species richness, rarity (total number of the rarest 25% of *Adelpha*, measured by numbers of specimens in collections) and endemism (within a biogeographic region) produces some similarities and some notable differences (Table 7). In all three cases the Atlantic region is top priority, but ranking of subsequent areas differs between the methods.

For a given biogeographic region, the number of rare species, as measured here, depends on average range size of species within the region, total species richness (a rich fauna will have more species that are low in abundance), and sampling effort. By far the major threat to natural populations is habitat destruction, and thus prioritisation of areas for conservation should concentrate on species with restricted ranges (e.g., Bibby *et al*., 1992). In this context, I regard the ranking obtained using the measure of rarity employed here as the most accurate reflection of where conservation effort is most needed for *Adelpha* species. When levels of current habitat destruction are also considered the importance of the Atlantic region, which has, by unlucky coincidence, lost the highest proportion of its natural forest habitat, is clearly paramount. There is little doubt that the biota of this region represents the greatest conservation concern in the neotropics, not only for *Adelpha*, which contains two species considered here as threatened, but also for virtually all other organisms (McNeely *et al*., 1990; Dinerstein *et al*., 1995; Biodiversity Support Program *et al*., 1995; Brown, 1996b). The majority of montane regions have also suffered extensive habitat destruction. Added to high rates of endemism and habitat loss, it should also be noted that the most phylogenetically primitive species in the genus have a tendency to occur in both montane and peripheral, more temperate regions (such as the Atlantic).

Table 7. Critical faunas analysis for *Adelpha* species by biogeographic region, based on three methods of area prioritisation.

Species richness	**A**	**B**	**C**	**D**	**Rarity**	**A**	**B**	**C**	**D**	**E**	**Endemism**	**A**	**B**	**C**	**D**
Atlantic	11	23	34	34	Atlantic	11	23	34	34	7	Atlantic	11	23	34	34
Amazon	4	5	9	43	West Andes	3	17	20	54	6	Mexico-Honduras	6	9	15	49
East Andes	5	11	16	59	Mexico-Honduras	6	1	7	61	5	East Andes	5	8	13	62
West Andes	3	7	10	69	Nicaragua-Panama	3	0	3	64	5	Amazon	4	5	9	71
Transandean	3	1	4	73	Amazon	4	5	9	73	2	West Andes	3	2	5	76
Nicaragua-Panama	3	1	4	77	East Andes	5	1	6	79	2	Nicaragua-Panama	3	0	3	79
Mexico-Honduras	6	0	6	83	Transandean	3	1	4	83	2	Transandean	3	1	4	83
Caribbean	2	0	2	85	Caribbean	2	0	2	85	0	Caribbean	2	0	2	85

A-Endemic species; B-Non-endemics not in previous countries; C-Total newly added species (A+B); D-Cumulative number of species included ; E-"rare" species

On a more positive note, considering an area 40 km by 40 km, the approximate average size of all government protected areas in Ecuador (INEFAN, 1998), an estimated ten such areas would be needed throughout the neotropics to represent all known species of *Adelpha* at least once (Fig. 22). This remarkably low number will, of course, not safeguard the futures of all species of *Adelpha*, but it illustrates that, in this genus at least, endemism is sufficiently low that with a good knowledge of distribution of species the effort required to provide some protection for all of them is not nearly as great as might be imagined. The low number is the result of high congruence between ranges of endemic taxa (usually defined by marked physical boundaries, see above) and extensive overlap of lowland and montane species at the base of the Andes. However, only an additional 21 areas would be required to include all *Adelpha* taxa, the majority of which are clustered in the northern Andes of Colombia and Venezuela.

Comparison with other taxa and future work

To what extent do patterns of diversity and areas of high conservation concern for *Adelpha* correlate with those for other taxa? Given the scale of the "biodiversity crisis", it has been suggested that focussing on certain indicator taxa might be one way to predict spatial patterns of species richness and endemism in other, unrelated taxa (Brown, 1991; Pearson, 1994; McGeoch, 1998; Williams & Gaston, 1998). This idea has received some criticism following several unsuccessful attempts to demonstrate congruent patterns of species richness in proposed indicator taxa (Prendergast *et al*., 1993; Prendergast & Eversham, 1997; Howard *et al*., 1998; Lawton *et al*., 1998). However, such studies compare the ecological indicator properties of taxa, or examine biodiversity indicator properties at fine scales across distinct habitats, either natural or disturbed, where ecological processes are likely to dominate over historical processes (see McGeoch, 1998, for a review of indicator categories). At larger scales and within single biomes (e.g., tropical lowland forest, savannah, etc.) it seems much more plausible that similar spatial patterns of species richness between taxa might occur, where these patterns are largely imposed by historical processes (Williams & Gaston, 1998; e.g., Pearson & Carrol, 1998; Lees *et al*., 1999). In addition, even when patterns of species richness do not correlate, patterns of endemism may do (e.g., Howard *et al*., 1998). Since *Adelpha* species occur in a variety of habitats at a broad range of elevations, and show much variation in ecological traits such as hostplant specificity and microhabitat preference, they might be expected to also reflect patterns of diversity in other forest butterfly taxa (Brown, 1991, 1996a).

At present there are few comparable data available to examine how well patterns of diversity in *Adelpha* correlate with those of other groups, but some crude comparisons are possible. For the nymphalid genera *Eunica*, *Hamadryas* (Jenkins, 1983, 1990), *Callicore* (Dillon, 1948), sub-families Ithomiinae (Beccaloni & Gaston, 1994), Charaxinae (Comstock, 1961), Brassolinae (Blandin, 1978) and swallowtail butterflies (Papilionidae) (Tyler *et al*., 1994), the highest community species richness occurs at the western edge of the Amazon basin and declines eastwards, as in *Adelpha*. This region also contains the globally highest reported community species richness for butterflies (Robbins & Opler, 1997), birds (Robinson & Terborgh, 1990), trees (Gentry, 1988) and mammals (Voss & Emmons, 1996), and a number of other diverse vertebrate and invertebrate groups (see references in Gentry, 1988; Voss & Emmons, 1996). In terms of endemism, areas identified as particularly high in endemic species for virtually all taxonomic groups (Atlantic region, Andes, montane Central America) (McNeely *et al*., 1990; Bibby *et al*., 1992; Dinerstein *et al*., 1995; Biodiversity Support Program *et al*., 1995) also contain high numbers of endemic *Adelpha*. One exception is the lowlands of the Chocó region, discussed above. It seems hard to deny substantial congruence at these large scales between unrelated taxonomic groups. I therefore suggest that areas of high conservation concern for *Adelpha*, and arrangements of areas to maximally represent *Adelpha* taxa, may well be similar for unrelated taxa. Of course, many more areas will be necessary when taxa with larger numbers and more highly endemic species are considered, but broadly similar conclusions have been reached for conservation of tropical South American birds; the most important areas are in the Andes and Atlantic region (Fjeldså & Rahbek, 1998). Without being overly optimistic, it seems likely that conservation of areas for their more "popular" bird and mammal faunas will also, incidentally, protect a large proportion of *Adelpha* species, and other forest butterflies.

Neotropical areas that are especially poorly sampled for *Adelpha*, and probably other butterflies, are the Venezuelan and Colombian Andes, montane habitats of southeastern Brazil, the Chocó, and most of central America between Mexico and Costa Rica. It would be difficult to overemphasise the importance of trapping with rotting carrion, or similar baits, for anyone attempting a serious inventory of *Adelpha* (or most neotropical butterflies; Hall & Willmott, 2000). In most localities, particularly primary forest, *Adelpha* species are seldom, if ever, observed, and certainly not rarer species. Males of the recently described species *A. hesterbergi* and *A. lamasi* are known from Ecuador only through the use of such baits. I sincerely hope that field workers will use the information on trapping techniques in Sourakov & Emmel (1995), Austin & Riley (1995) and Shuey (1997), to contribute to our knowledge of *Adelpha* distribution and diversity.

SPECIES ACCOUNTS

The species are arranged here in an order largely corresponding to most primitive to most derived, following an unpublished cladistic analysis of the genus (Willmott, 1999, in prep.). The main exception is my treatment of the *A. alala* group after the *A. serpa* group, even though the former is apparently the most primitive in the genus. My reasons for this are the weak support for basal nodes in the current cladogram, suggesting that the *A. serpa* group may yet prove to be the most primitive, and since it is also the most phenotypically isolated and defined group in the genus, I treat it first for convenience. In many cases I have also relied on wing pattern characters that vary too much throughout the genus to be coded for cladistic analysis to propose relationships among taxa. Such characters are discussed under each species, in addition to the characters that I consider important in their identification and which unite the taxa included in each; this information is presented separately from the constituent taxa in the case of polytypic species. In a very few cases there is no single character that defines the species, but taxa are grouped on the basis of shared characters between pairs of allopatric taxa. I use the terms DFW, VFW, DHW and VHW to refer the dorsal and ventral, fore and hindwing respectively. For each subspecies I discuss how it is distinguished from other subspecies, its variation, and the nomenclature and associated synonymy.

The dates of publication of names are those given in Lamas *et al.* (1995), except those for the plates published by Fruhstorfer in Seitz ([1907]-1925). In this case, plates 106-109 were published in 1913, plate 110 in 1916 and plate 110A in 1920, and the dates for these plates given in Lamas *et al.* (1995) are incorrect (G. Lamas, pers. comm.). Treatment of the names which appeared on plates 106-109, two years before the text (Fruhstorfer, 1915), is somewhat problematic. These names appeared individually beneath figures, with the name "*Adelpha*" at the top of the plate, and the taxonomic status (species, form, subspecies) that has been accorded them by all subsequent authors, as far as I am aware, is that of Fruhstorfer's (1915) text. However, Gerardo Lamas (pers. comm.) is of the opinion that such names should be regarded as species with the spelling as on the plate, and Philip Tubbs (pers. comm.), of the International Commission on Zoological Nomenclature at the BMNH, also confirms this to be the procedure resulting from strict application of the Code. The publication date for these problematic names is therefore 1913 and all are regarded as of specific status, and since the type locality in all cases has been determined from an "outside" source (Fruhstorfer, 1915), I have enclosed such localities in square parentheses. Since there is no information on the plates as to the number of specimens on which the name is based, I have regarded all type material for such names as syntypic, regardless of indications to the contrary in the text (Fruhstorfer, 1915).

After the type specimen data, I list the first author to use alternative taxonomic combinations, with a " = " indicating the name was regarded as a synonym, misidentifications, and the most recent taxonomic combination, which I use to determine whether or not the combination presented here is new or revised. Since virtually no previous authors ever explicitly stated that they were making new or revised taxonomic combinations, I have been somewhat arbitrary in my choice of whether or not to regard a combination as valid. I have generally given credit to authors for new taxonomic combinations that I believe to be correct, but have not regarded taxonomic changes that I believe incorrect as valid unless accompanied by a specific statement of the author's intent. I have not attempted to list the numerous misspellings of names in the literature (e.g., Martín *et al.*, [1923]), and have corrected trivial misspellings in citing previous taxonomic combinations and misidentifications. I use the term **syn. nov.** to denote a name regarded for the first time as synonymous, **stat. nov.** for any name formerly considered to be of different taxonomic rank or, if a subspecific name, combined with a different specific name, and **stat. rest.** for a taxonomic rank or combination reverted to that of a previous author. I have also listed bibliographic and type data for quadrinomials under the appropriate taxon; although such names are unavailable, subsequent authors may introduce a new name, originally described as a quadrinomial, through reference to its original description, in which case the original type material becomes that of the new name (e.g., *Adelpha justina maira* Orellana, 1996). I list *nomina nuda* and species erroneously placed in *Adelpha* in Appendix G. To aid identification of *Adelpha*, I list changes to names published in popular reference works as a result of new taxonomic combinations made here, and names based on a misidentification (Appendix H).

Ecological information on the adults and immature stages is presented for each taxon from my own field work and published sources. Hostplants are listed in Appendix C and are usually not mentioned in the species account, unless there is some problem in identification or extra ecological information that cannot be included in the table. Specimen data are listed as detailed above under Materials and Methods. Adults of all *Adelpha* taxa are illustrated in Figs. 31-116, with the associated specimen data in Appendix I, with drawings of the male and female genitalia for the majority of species presented in Figs. 124-280. Range maps for all species are also presented (Figs. 281-316).

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Adelpha bredowii Geyer, 1837

Figs. **32**; 124; 208; *281*

Identification, taxonomy and variation:

Adelpha bredowii is easily distinguished from all other species in the genus by its large size, broad wing shape and contrasting ventral colours of white, blue-grey, dark red-brown and orange bands on a black background. There is variation in the extent of the orange DFW subapical marking, the width of the white DFW postdiscal spots at the costa, the configuration of the white DFW postdiscal band, the presence or absence of a second orange band crossing the end of the VHW discal cell and the extent of the blue-grey line distal to the white postdiscal band on the VHW, and I recognise three subspecies. Carpenter & Hobby (1945) give an exhaustive discussion of wing pattern variation in this species and only major variation will be noted here. The shape of the valva of the male genitalia is rather variable (see Fig. 124), and may be strongly pointed and curved posteriorly, or taper more gradually, being similar in shape to the valva of other members of the *A. serpa* group. The shape and size of the corpus bursae in the female genitalia are also variable, and in one specimen dissected it appears to be slightly constricted in the middle.

The generic status of this species has had a rather unstable history, for although Geyer (1837) correctly placed the taxon in *Adelpha* in his original description, being the first author to use Hübner's recently erected genus, *A. bredowii* has since oscillated almost continuously between *Adelpha*, the junior synonym *Heterochroa*, and *Limenitis*. This is partly due to its large size and atypically colourful ventral wing pattern, superficially recalling the North American species of *Limenitis* with which *A. bredowii* commonly occurs (Seitz, 1915). In addition, the eyes of *A. bredowii* are smooth, rather than setose as in almost all *Adelpha*, a character shared with the North American *Limenitis* (Godman & Salvin, 1884). The lack of other obvious, external structural characters by which to separate *Limenitis* and *Adelpha* exacerbated the problem, and the generic placement of the species seems to have been based largely on personal preference. In fact, *A. bredowii* is closely related to *A. diocles*, as evidenced by several characters of the male and female genitalia (see especially the reduced, circular patch of sclerotised spines on the corpus bursae, Figs. 208, 209), and probably *A. herbita*. *Adelpha bredowii* and *A. herbita* share the entire loss of the outer postdiscal series on the VHW except in cell 2A-Cu$_2$, unique in the *A. serpa* group. The brownish shading in the postdiscal area of the VHW of *A. bredowii* appears to represent the ground colour, as indicated by the fact that it differs in colour and surrounds the brighter orange marking that represents the outer postdiscal series in cell 2A-Cu$_2$. A number of other wing pattern and genitalic characters place *A. bredowii* firmly within the *A. serpa* species group, as one of its most primitive members, and one of the most primitive members of the genus (Willmott, 1999, in prep.). Synapomorphies of the *A. serpa* group possessed by *A. bredowii* include the reduction of the basal streak in the DFW discal cell, which lies close to the costa and borders an area of dense reddish scales, the absence of a basal streak in the VFW and VHW discal cells, the well-defined black line that extends from the base of the VHW to the tip of the humeral vein, the loss of the clunicula in the male genitalia and gain of a sclerotised, spiny pad in the aedeagus, and the coarsely spined, sclerotised bands on the corpus bursae of the female genitalia. *Adelpha bredowii* is the only member of the *A. serpa* group in which the inner postdiscal series is visible on the VHW, with this marking probably being lost in remaining species, suggesting that it is the most primitive species in the group (Willmott, 1999, in prep.).

Range and status: Western USA throughout Mexico to Guatemala. Scott's (1986) report of Honduras is based on mislabelled specimens. Common in deciduous woodlands, from at least 300m to 2400m.

Specimens examined: 1318 (903♂, 415♀)

Adelpha bredowii bredowii Geyer, 1837

Figs. **32a,b**; *281*

Adelpha bredowii Geyer (1837: 10, n. 413)

TL: Mexico. **Types**: **ZMHU**: **ST**♀: Mexico//Syntype//Origin//Coll. Sommer [examined]

Heterochroa bredowii Geyer, Westwood (1850); *Limenitis bredowii* Hübn. [sic], Edwards (1870), Seitz (1915); *Adelpha bredowii bredowii* Geyer, Emmel *et al.* (1998)

Identification, taxonomy and variation:

This subspecies differs from *A. b. eulalia* in having a narrower, less triangular orange subapical marking on the DFW, which forms a spot in cell Cu$_1$-M$_3$ and extends as orange scaling into cell Cu$_2$-Cu$_1$; in other subspecies, the orange marking is much broader at the costa and seldom extends into cell Cu$_1$-M$_3$, and if so, only as sparse orange scaling. The white postdiscal spots at the costa are much smaller, approximately half of instead, of equal to, the width of the white postdiscal spot in cell M$_3$-M$_2$, and the hindwings are less rounded. *Adelpha b. californica* is easily distinguished by having an extra orange band across the end of the VHW discal cell, the blue-grey band distal to the white VHW postdiscal band broken in the middle, by its smaller size and by a more distally displaced white postdiscal spot in cell M$_3$-M$_2$ of the DFW. In the small series of specimens examined there is slight variation in the size and extent of the orange DFW subapical marking, and it is possible that more extensive collecting will show this character to vary clinally to that of *A. b. eulalia*. Specimen and literature records also indicate a potentially significant degree of geographic overlap between the nominate subspecies and *A. b. eulalia* (see discussion under Range, below). However, I have seen so few specimens with precise locality data, few intermediate specimens (2 out of 26 *A. b. bredowii* and 39 *A. b. eulalia* examined from the states bordering or within the range of *A. b. bredowii*) and the two taxa are recognised by local workers (e.g., de la Maza, 1987), so I retain them for the present.

Both wing surfaces of this species were accurately figured by Geyer ([1832]-[1833]: pl. 142, fig. 825, 826), several years before he introduced the name based on an unspecified number of supposedly male specimens which he had received from Herr Sommer (Geyer, 1837), and there has never been any question as to its identity. I have examined a syntype female in the ZMHU, which differs from the original figure in having a more irregular white DHW postdiscal band, the veins in the dark red-brown VHW postdiscal area not lined with silver-blue, and no tiny white postdiscal spot in cell M$_3$-M$_2$ on the DFW, but it is otherwise similar and has all of the characters that distinguish this subspecies from others. The specimen has also been pinned with the forewings distinctly far forward, uncommon for specimens of that time and unlike the original figure. It seems unlikely that this was the figured specimen, but since it has data indicating it to be from the collection of Sommer it is almost certainly a syntype, notwithstanding Geyer's statement that the description was based only on males (early authors often misidentified sexes of *Adelpha*).

Range: Pacific slopes of central western Mexico, at the southern tip of the Sierra Madre Occidental. Michoacán is the only state that *A. b. bredowii* has been reported from where there are not also records of *A. b. eulalia*; to the northwest (Jalisco) and southeast (Guerrero, Morelos, México and Oaxaca) there are records of both taxa. Vargas *et al.* (1996) list *A. b. eulalia* as occurring in Jalisco, but also list de la Maza's (1987) record of *A. b. bredowii* from that state as *A. b. eulalia*. Since de la Maza (1987) figured both of these subspecies correctly I have followed his identification here, having seen no specimens from that state myself. Whether *A. b. bredowii* and *A. b. eulalia* are truly sympatric over such a large area, or locally allopatric, and whether the forms are connected by intergrades, requires field study and/or examination of Mexican collections with more material. I have also seen three specimens labelled "Guatemala", two of which, in the BMNH, were commented on by Carpenter & Hobby (1945), who suggested, probably correctly, that they had been mislabelled.

Habitat and adult ecology: De la Maza (1987) reports that this subspecies has been found in Mexico in pine-oak forests in March. It has been recorded up to 2400m, and its relative rarity in collections probably reflects its limited geographic range.

Specimens examined (23♂, 3♀): † - trans. to *A. b. eulalia*.
MEXICO (20♂, 3♀): *Guerrero*: Omiltene 8000' Jul. Nov. 7♂ BMNH, 2♂ AME; Río Balsas Apr. 1♂ USNM, 1♂, 1♀ AMNH; Xucumanatlán 7000' Jul. 1♂ BMNH; no specific locality 2♂ BMNH; *Michoacán*: Uruapán 1♂ BMNH; *Morelos*: Cuernavaca Sep. 1♂ BMNH-error?; *Oaxaca*: Oaxaca 1♂ BMNH; *Not located*: no specific locality 2♂, 1♀ BMNH, 1♂, 1♀ ZMHU, 2♂ MNHN.
"**GUATEMALA**" (3♂): no specific locality 2♂(1†) BMNH, 1♂ BMB-error?.
Additional locality data: **MEXICO**: *Guerrero*: Cruz de Ocote; Filo de Caballo; *Jalisco*: Autlán; *México*: Valle de Bravo (de la Maza, 1987); *Jalisco*: km 90 rd. to Autlán Sep. (Field, 1940b); Bosque Escuela Jan. Mar. Apr. Aug. Sep.; Est. Científica Las Joyas La Ordeñita Mar. (Vargas *et al*., 1996: as *A. b. eulalia*); *Michoacán*: Carapa Sep. (Field, 1940b); *Oaxaca*: 12 mi. S. of Oaxaca (Carpenter & Hobby, 1945).

Adelpha bredowii eulalia (Doubleday, [1848])

Figs. **32c,d**; 124a; *281*

Limenitis eulalia Doubleday ([1848]: pl. 36, fig. 1)

TL: "Venezuela"-erroneous. **Types**: **BMNH**(M): **ST**♀: "? The Type specimen figured L. bredowi Hbn. s.sp. eulalia Dbl. Det. G.D. Hale Carpenter 1943//2. Heter. ? Bredowii Hb. Zutr. 825-6 Mén. p.11g-Dbd. p.279 No. 12 Eulalia Dbd. Diurn. pl. 36 fig. 1 Méxique donné por M. Doubleday Dbd. a reconnu la Bredowii aprés qu'il a fait figure son eulalia//124//Syntype//Type//Ex Musaeo Ach. Guenée//Ex Oberthür Coll. Brit. Mus. 1927-3" [examined]

=*Limenitis bredowii guatemalensis* Carpenter & Hobby (1945: 318, pl. 1, figs. 7-9, pl. 2, fig 12) **syn. nov.**

TL: San Gerónimo, Guatemala. **Types**: **BMNH**(T): **HT**♂: "Genitalia C//Holotype L. bredowi Hbn. f. n. guatemalensis TYPE G. D. Hale Carpenter 1943 M.S. Photo fig. 7 17//B.C.A. Lep. Rhop. Adelpha bredowi Hbn. Godman-Salvin Coll. 1916.-4.//San Gerónimo Guatemala F.D.G. & O.S.//♂//Type H.T."; **AT**♀: Polochic Valley; **BMNH**(M): **PT**♀: San Gerónimo; 3**PT**♂: Polochic Valley; **PT**♂: Río Polochic; 2**PT**♂: Guatemala city; **PT**♂: Verapaz; **PT**♀: Central Valleys; **PT**♂: Mexico [all examined]

=*Heterochroa bredowii* Geyer, Westwood (1850); =*Limenitis bredowii* Hübn. [sic], Edwards (1870); =*Adelpha bredowii* Hübn. [sic], Kirby (1871); =*Limenitis bredowii bredowii* Geyer, Seitz (1915); *Limenitis bredowii eulalia* Dbld., Carpenter & Hobby (1945); *Adelpha bredowii eulalia* Dbld. & Hew. [sic], Emmel *et al*. (1998)

Identification, taxonomy and variation:

Adelpha bredowii eulalia is distinguished from the nominate subspecies in the account of that taxon, and from *A. b. californica* by lacking a second orange bar at the end of the VHW discal cell, by having a complete blue-grey line distal to the white postdiscal band on the VHW, and by having the white postdiscal blocks on the DFW in cells 2A-M_3 more aligned. The extent of the orange DFW subapical area is slightly variable, sometimes extending as orange scaling into cell Cu_1-M_3, and the white DFW postdiscal band also varies minorly in width. A white postdiscal marking is variably present in cell M_3-M_2 on the DFW, as discussed below.

Doubleday ([1848]), in his original description, accurately figured the dorsal surface of both wings of this subspecies but gave no indication of the specimen on which the figure was based, while the list of plates in Vol. 1, p. viii, gives the certainly erroneous locality of "Venezuela". A syntype female in the BMNH corresponds well with the original description, however, and originated in Mexico. Westwood (1850: 278) placed *L. eulalia* as a synonym of *Adelpha bredowii*, a taxon of which it appears Doubleday was unaware when he made his original illustration, and gave Mexico as a locality for both *A. bredowii* and *L. eulalia*. Although several subsequent authors (e.g., Seitz, 1915) followed Westwood, I retain *A. b. eulalia* and *A. b. bredowii* for reasons discussed under the nominate subspecies, though it is certainly possible that they are not distinct taxa.

After a very thorough discussion of variation in *A. bredowii eulalia*, Carpenter & Hobby (1945) described a new subspecies, *guatemalensis*, for Guatemalan specimens. Their type series is in the BMNH. They state that the subspecies differs from *A. b. eulalia* in having a narrower orange DFW subapical marking, a broader white dorsal postdiscal band, and a better developed white postdiscal spot on the DFW in cell M_3-M_2. While this latter spot is often absent in *A. b. eulalia*, it is present in a number of specimens throughout the range of the subspecies and occasionally as developed as in certain Guatemalan specimens. In addition, although generally the orange DFW subapical marking is slightly narrower and the white dorsal postdiscal band broader in Guatemalan specimens than in typical *A. b. eulalia*, both of these characters are variable and do not enable consistent recognition of a distinct taxon, and I therefore synonymise *guatemalensis* with *A. b. eulalia* (**syn. nov.**).

Range: Southeastern USA in the states of Arizona, Utah, Texas, New Mexico, Colorado and Nevada, through Mexico to eastern Guatemala, along the Atlantic slopes of the latter countries; the taxon probably also occurs in western Honduras. I have examined a few specimens labelled from areas in California, and although these particular records are probably dubious, the subspecies does occur in the extreme southwest of that state (Emmel & Emmel, 1973; Ferris & Brown, 1981). Field (1940a) reported a single female from Scott City in Kansas, and Ferris & Brown (1981) also report it as strays from that state and provide a map of collection localities for Rocky Mountain states in the USA. There are also records from the states of Morelos, México, Jalisco, Oaxaca and Guerrero in Mexico, where *A. b. bredowii* appears to fly, and the ranges of both of these taxa confirmation.

Immature stages: Harry (1994) provided a fully illustrated colour photographic life history for this subspecies, the first and last for any *Adelpha*, reared in Utah, USA. The egg is green and laid singly on the upper surface of the leaf at the margin, at the tip of a leaf "tooth". It appears to be typical of the genus in morphology. The first instar is pale greenish with a brown head and dark spots marking the positions of the future subdorsal scoli. The second instar has slight projections in place of future scoli and has lateral dark brown, pale yellow green and green oblique stripes on each segment, typical of many *Adelpha*. The third instar has developing scoli on segments T2, A2, A4, A7 and A8 and a similar pattern to the second instar, except with the markings less well defined. The head capsule is pale brown with vertical dark brown stripes. The fourth instar has well developed, orange-brown subdorsal scoli on T2, T3, A2, A4, A7 and A8, each with black lateral spines, small, pale supraspiracular scoli, and the head capsule appears to have a relatively smooth face with two especially long, black tipped dorsal spines. It is pale greenish with paler bumps and dorsally is darker green anterior of A1, between the scolus bases on A7 and A8, and on A9/10. The final instar is a uniform bright green, slightly darker dorsally, with a brown ventral surface, long, relatively thick scoli on T2, T3, A2, A4, A7 and A8 (longest on T2, A2 and A8), each orange-brown with fine, thin pale whitish or black lateral spines. All scoli are straight, the thoracic pair anteriorly inclined, those on T3 also orientated slightly laterally. There are short subdorsal scoli on segments A3, A5 and A6, lacking lateral spines, while all other scoli, notably also the supraspiracular scolus on T2, appear to be absent. Just prior to pupation the larva becomes a yellowish brown. The pupa is dark brown on the wing pads and T1, but otherwise appears to be silver, with a moderate dorsal projection on A2 and a smaller dorsal hump on T2. The head horns are short but their shape is not visible. Other authors have also described various stages, and the mature larvae may also be mottled green (Ferris & Brown, 1981). Scott's (1986) description may apply to this subspecies or *A. b. californica*. He states that the larva occurs in a second form, which is yellow orange with a brown lateral line bordering the paler brown ventral surface. The pupa may also be straw coloured with finer brown marks and gold streaks.

Early instars construct typical perches from leaf veins, on which they rest in the Front Curved position (of Aiello, 1984; see also introduction to genus). Harry (1994: figs. 5, 7) also illustrates third and fifth instar larvae resting in the Front-Arched-Rear-Up position (of Aiello, 1984), with the face parallel to and closely pressed against the leaf. Larvae are in diapause over the winter, according to Ferris & Brown (1981) and Scott (1986).

Habitat and adult ecology: In the USA this subspecies is locally common in moist lowland areas down to 300m. It frequents riparian canyons and forest areas along streams, where both sexes rest frequently on the tips of branches to sun themselves (Ferris & Brown, 1981) Males often congregate at puddles and moist sandy patches along streams (Ferris & Brown, 1981). Bailowitz & Brock (1991) report that this subspecies is most common in mountainous areas, usually above 1300m, though it has also been rarely sighted some distance from natural habitats, in agricultural areas and even in towns. Adults perch high in oak trees and may occasionally nectar at flowers of *Chrysothamnus* and *Baccharis*. Scott (1986) also states that adults of this subspecies, or *A. b. californica*, may be found feeding on fruits (presumably rotting) and aphid honeydew. When mating pairs of this species (possibly *A. b. californica*) are disturbed, it is the female that flies and carries the male (Scott, 1973). There are several broods throughout most of the range in the USA, though Emmel & Emmel (1973) report it to have only a single brood in the desert mountain ranges of southern California, with adults flying from May to July. Cary (1994) reports that the species flies in southwestern New Mexico from May to June, then August to October, while there are records of adults from elsewhere in the USA from as early as April and as late as December (Ferris & Brown, 1981; Bailowitz & Brock, 1991). In Mexico, the subspecies has been reported from pine-oak forests from February to October, with a peak of abundance in the middle of this period (de la Maza, 1987; de la Maza & de la Maza, 1988), and it has been recorded from 700-2100m in Chiapas in hot to temperate, humid to semi-humid forests (Beutelspacher, 1983; de la Maza & de la Maza, 1993: as *L. bredowii guatemalensis*). In Guatemala the subspecies has been reported from montane areas above 1200m, where it appears to be more uncommon (Godman & Salvin, 1884).

Specimens examined (386♂, 190♀): † - trans. on dorsal surface to *A. b. californica*; ‡ - trans. to *A. b. bredowii*.

USA (304♂, 140♀): *Arizona*: Alpine Jul. 1♂, 1♀ AMNH; Arcenta Canyon Jun. 1♂ USNM; Baboquivari Mts. Jun. Oct. 2♂ USNM, 1♀ AMNH; Chiricahua Mts. May Jun. Jul. Sep. 1♂, 1♀ USNM, 8♂, 5♀ AMNH, 1♂ AME, 7♂, 9♀ FSCA; Cochise Co. 1♂ AMNH, 2♂ MCZ; Coyote Mts. 1♀ AMNH; Dinnebito Wash Aug. 1♂ USNM; Flagstaff May 2♀ USNM; Fort Grant Jul. 1♀ USNM; Gila Co. Jun. 1♂ MCZ; Globe May 5♂ AME, 3♂ AMNH; Globe, 12 mi. N.E., 4000' May 1♂, 1♀ AME; Graham Mt. Aug. Sep. 1♀ USNM, 1♂ AMNH; Grand Canyon Aug. 1♂ FSCA; Heber-Pine Sep. 1♂, 1♀ AMNH; Herb Martyr Dam Sep. 2♂ FSCA; Hereford Jul. Aug. 2♂ MCZ; Horsethief Basin Jul. 2♂ FSCA; Huachuca Mts. May Jul.-Sep. 11♂ BMNH, 8♂, 5♀ USNM, 10♂, 1♀ AMNH, 2♂, 3♀ FSCA, 1♂ MCZ; Jerome, 2 mi. S., 1000' May 3♂ USNM, 1♀ FSCA; Madera Canyon Pima Co. Santa Rita Mts. Jun.-Sep. 18♂, 2♀ USNM, 4♂ AMNH, 5♂, 1♀ AME, 3♂ FSCA; Madua Canyon Santa Cruz Co. 4800-5400' May Jul. Sep. 3♂, 2♀ AME; middle Pioneer Camp Pinal Mts. Aug. 31♂, 15♀ AMNH; Oak Creek Canyon Jun. 2♂, 2♀ AMNH; Onion Saddle Sep. 1♂, 1♀ FSCA; Palmerlee Aug. 1♂, 1♀ BMNH, 9♂, 4♀ USNM; Paradise Jun. Aug. Sep. 1♂ USNM, 9♂, 1♀ AMNH, 1♂ FSCA; Patagonia Mts. Jun. Sep. 3♂ AMNH; Payson, 10 mi. S., Aug. 1♂ AMNH; Pine Creek Jun. Aug. Sep. 2♂ FSCA, 1♂, 1♀ USNM; Portal 5400' May-Jul. Sep. Oct. 1♀ USNM, 11♂, 15♀ AMNH, 1♂, 1♀ MCZ; Prescott 1♂ BMNH, 1♂ USNM; Ramsey Canyon (Huachuca Mts.) Jun.-Sep. 8♂, 7♀ AMNH, 3♂, 1♀ AME; Rose Creek Jun. 5♂, 1♀ USNM; Santa Catalina Mts. May 6♂, 2♀ AMNH; Santa Rita Mts. Sep. 1♂ FSCA, 1♀ AMNH; Senator Jun. 6♂, 6♀ BMNH; Silver Creek Jun. 1♂, 2♀ AMNH; Skeleton Canyon Oct. 1♂ FSCA; Sonoita Jul. 1♀ USNM; Water Canyon 5000' 1♂ BMNH; White Mts. May Jun. 6♀ AMNH; Williams 1♂, 1♀ USNM; no specific locality Jun. Jul. 1♂, 1♀ BMNH, 1♂, 2♀ USNM, 2♂ AMNH; "*California*": Redlands, San Bernadino Mts. Jul. 5 1930 1♂ AME-error; Los Angeles Jun. 12 1923 1♂ AME-error; Fresno Jun. 18 1928 1♂ AME-error; *Colorado*: Durango Aug. 1♂ AMNH; *Nevada*: Charleston Mts. May Nov. 3♂†, 1♀† USNM, 3♂ AMNH; Clark Co. Jun. 3♂† USNM; *New Mexico*: Brooks Ranch Sep. 3♂ AME; Cherry Creek, Pinos Altos Mts. Jun. Jul. Sep. 5♂, 1♀ USNM, 1♂ FSCA; Central New Mexico Jun. 2♂, 4♀ USNM; Fort Wingate Sep. 1♂ AMNH; Hell Canyon Oct. 1♂ USNM; Jemez Springs Sep. 1♂ AMNH; McMillan Camp Jul. 24♂, 8♀ AMNH; Mogollon 7200' 2♂, 1♀ AMNH; Organ Mts. 5600' Jun. 1♂, 1♀ AMNH; Pinos Altos Sep. 1♂ AME; San Mateo Mts. 7400' Jul. 1♂ AMNH; Tajaque Canyon Jun. 1♂ FSCA; *Texas*: Alpine Jul. 1♂, 2♀ AMNH, 1♂ FSCA; Big Bend N.P. 3-4000' Sep. 1♀ AMNH; Browne 1♂ AMNH; Edwards Mts. Jul. 1♂ USNM; Green Gulch Big Bend N.P. Aug. 2♂ FSCA; Kerrville Apr. Oct. 1♂, 1♀ USNM, 1♀ FSCA; New Braunfels Oct. 2♂ FSCA; Sunny Glen Ranch Jul. 1♀ AMNH; The Basin Big Bend N.P. Aug. 1♂ FSCA; no specific locality 2♂ BMNH; *Utah*: Hellhole Pass Denver Dam Mts. Aug. 1♀ AME; Leeds Creek Pine Valley Mts., Washington Co. May Jun. Sep. 5♂, 2♀ AME; Oquirrh Mts., Tooele Co. Aug. 1♂ AME, 1♂ FSCA; Stockton Aug. Sep. 2♀ USNM; Tooele Aug. 1♂ AMNH; no specific locality 1♂ USNM; *Not located*: "California" 1♂ MCZ; no specific locality 1♀ BMNH. **MEXICO** (59♂, 37♀): *Chiapas*: Campet Aug. 1♂ AME; Chiapas 2♂ AMNH; Lagos de Montebello 1500-1800m Feb. 1♀ AME; Montibe Sep. 3♂, 3♀ AME; Santa Rosa 4♂, 2♀ AME; *Chihuahua*: Catarinas Jun. 1♀ AMNH; Chihuahua Sep. 1♂ AMNH; Ciénegas Jun. 1♀ AME; S.W. Colonia Juárez Sep. 1♂ AME; La Mesa de la Averna 1♂ AME; Madera Jun. 6♂, 10♀ AME; Pinos Altos 1♀ BMNH; Primavera Jun. 2♀ AMNH; *Distrito Federal*: Pedregal Apr. Aug.-Oct. 14♂, 4♀ AME, 1♀ AMNH; *Durango*: nr. Durango City 1♀ BMNH; Encino Jun. 1♀ AMNH; *Guerrero*: Acahuizotla Oct. 4♂ AME; Apulco Nov. 1♂ AME; no specific locality 2♂ BMNH; *Hidalgo*: Cuesta Colorada 8500' Aug. Sep. 3♂ AMNH; Puerto de Zorro Apr. 1♀ FSCA; Zimapán, 5 mi. N.E., 2100m Aug. 1♀ AME; *México*: Amecameca Apr. 1♀ BMNH; Chalma Jul. 3♂ AME; *Morelos*: Yautepec Aug. 1♂ AME; *Nuevo León*: Hda. Vista Hermoso Villa Santiago 1500' Jun. 1♂, 1♀ AME; *Oaxaca*: Santa Rosa, 27 km S.E. Sep. 1♂ BMB; no specific locality 2♂(1‡), 1♀ BMNH; *Puebla*: Puebla 7000' Apr. 1♀ BMNH, 1♂, 1♀ MNHN; Tehuacán 5400' Nov. 1♂ BMB; *Sonora*: Bacarac Sep. 1♂ AMNH; Cananea Aug. 3♂ AMNH; *Not located*: Bolanos-Guadalajara rd. Jul. 1♀ USNM; no specific locality 1♂, 1♀ BMNH, 1♂ AMNH. **GUATEMALA** (16♂, 6♀): *Alta Verapaz*: Polochic Valley 3♂, 1♀ BMNH, Río Polochic 1♂ BMNH; *Baja Verapaz*: San Jerónimo 1♂, 1♀ BMNH; Santa Rosa 1♂ BMNH; *El Quiché*: Llano del Coyote Sacapulas Oct. 1♂ AME; *Guatemala*: Guatemala City 2♂ BMNH, 3♂ USNM; *Huehuetenango*: Colotenango 1♂ USNM; *Zacapa*: Zacapa 1♂, 1♀ USNM; *Not located*: Central Valleys 1♀ BMNH; no specific locality 1♂ BMNH, 1♂ ZMHU, 1♀ MNHN, 1♀ MCZ. **COUNTRY UNKNOWN** (7♂, 7♀): no specific locality 5♂, 2♀ USNM, 2♂, 3♀ AMNH, 2♀ MCZ.

Additional locality data: **USA.**: *California*: New York Mts.; Providence Mts.; Granite Mts. N. of Amboy (Emmel & Emmel, 1973); *Kansas*: Scott City (Field, 1940b); *New Mexico* (all localities are counties – precise data in Toliver *et al*. (1994)): Bernalillo; Catron; Chaves; Cibola; Colfax; Doña Ana; Eddy; Grant; Hidalgo; Lincoln; Los Alamos; Luna; McKinley; Mora; Otero; Rio Arriba; Roosevelt; Sandoval; San Juan; San Miguel; Santa Fe; Sierra; Socorro; Taos; Torrance; Valencia; Apache; Culberson; El Paso; Jeff Davis; Mun. Batopilas; Mun. Casas Grandes; Mun. Janos; Mun. Urique (Toliver *et al*., 1994); *Texas*: Concan; Leaky Jul. (Field, 1940b). **MEXICO**: *Chiapas*: El Chorreadero 700m Jan. Aug. Nov. Dec. (Beutelspacher, 1983); Depresión Central; Macizo Central (de la Maza & de la Maza, 1993); *Distrito Federal*: Pedregal de San Angel (Beutelspacher, 1980), Padierna; Tlalpán; *Chihuahua*: Madera; *Durango*: Michilía; *Hidalgo*: La Encarnación; *Morelos*: Tepoztlán; *Nuevo Léon*: Monterey; *Oaxaca*: Ixtlán (de la Maza, 1987); *San Luís Potosí*: Sierra de Alvarez 1200m Feb.-Nov. (de la Maza & de la Maza, 1988).

Adelpha bredowii californica (Butler, 1865)

Figs. **32e,f**; 124b; 208a,b; *281*

Heterochroa californica Butler (1865a: 485)

TL: California [USA]. **Types**: **BMNH**(T): **ST**♀: "Califor. 56 48//B.M. TYPE No. Rh. 9766 Heterochroa californica ♀ Butl.//16//Type AGB// Syntype//Type" [examined]

=*Limenitis bredowii* Hübn. [sic], Edwards (1870); *Adelpha californica* Butl., Kirby (1871); *Adelpha bredowii californica* Butl., Emmel *et al*. (1998)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate and *A. b. eulalia* by having a second orange cell band at the distal end of the VHW discal cell (this is very occasionally absent (Carpenter & Hobby, 1945)), by the blue-grey band distal to the white postdiscal band being broken or weaker in cells M_3-M_2 and M_2-M_1, its smaller size, more rounded wings and narrower white dorsal postdiscal bands. Carpenter & Hobby (1945) give an extensive discussion of variation in the subspecies.

Butler (1865a) described this taxon based on an unspecified number of specimens in the British Museum, which he compared with *A. bredowii bredowii*, and mentioned the orange bar at the end of the VHW discal cell. I have examined a syntype female in the BMNH.

The presence of the orange band at the distal end of the VHW discal cell is unique within the *A. serpa* group, and strong indication that the continuous orange band basal to the white postdiscal band on the VHW in more derived members (*A. nea*, *A. serpa*, etc.) is a result of the widening of the area between cell bars one and two. However, the absence of the cell band in occasional specimens of *A. b. californica*, as well as the similar male and female genitalia and wing pattern, lead me to treat this taxon as conspecific with *A. b. bredowii* and *A. b. eulalia*.

Range: Western USA in the states of California and Oregon, with a very few records in western Nevada (Carpenter & Hobby, 1945), Arizona and northern central Utah (Carpenter & Hobby, 1945), to extreme northwestern Mexico in the peninsula of Baja California. Dornfeld (1980) provides a map of collecting localities within Oregon. There are several clearly mislabelled specimens from Honduras (see list of specimens, and Carpenter & Hobby (1945)) which are probably responsible for the inclusion of this country in the range of *A. bredowii* by Scott (1986).

Immature stages: The most frequently reported hostplant of this subspecies is *Quercus chrysolepis* (Canyon Live Oak), in California (Comstock, 1927; Howe, 1975; Orsak, 1977; Dornfeld, 1980; Christensen, 1981), while Comstock (1927) also implied that it fed on other, unidentified species of *Quercus*. In the peninsula of Baja California (Mexico), the subspecies feeds on *Quercus agrifolia* in the lowlands and *Quercus chrysolepis* at higher elevations (Brown *et al.*, 1992). Scott (1986) cited a number of species of Fagaceae as hostplants, listed in Appendix C under *A. b. eulalia*, without stating whether they applied to that taxon or to *A. b. californica*.

The earliest published notes on the immature stages of this taxon are also the first for any *Adelpha* species, comprising a description of the pupa by Edwards (1873). Subsequently, both Dyar (1891) and Comstock & Dammers (1932) described all of the immature stages in great detail, though Dyar mentions only four instars, presumably omitting the first, and their observations are summarised here. The egg is green, morphologically typical of the genus and laid singly at the tip of a leaf on the upperside. The first instar is olive green with paler flecks, the head capsule mottled light and dark brown, with bumps marking later scoli. The second instar is green (Dyar) or various shades of brown (Comstock & Dammers) with darker spots marking the subdorsal scoli on T2, T3, A2 and A8, a dark brown supraspiracular line and a pale brown head capsule. The third instar is pale brownish yellow and densely covered with yellowish conical tubercles, with developing scoli on T2, T3, A2 and A8, each terminating with 4-5 black spines. The head is pale greenish and also densely covered with conical tubercles, with four vertical brown stripes on the front and sides of the head capsule, long black dorsal spines and black-tipped lateral spines. The fourth instar is light reddish-brown with a lateral greenish tinge and the tubercles are yellowish, while the scoli are brown with black tipped spines. Scoli are well developed on the segments as in previous instars, and also there appear small scoli on A4 and A7. The chalazae and spines of the head capsule are now yellowish white with black tips. The fifth instar is olive green and densely covered with conical yellowish tubercles which become more dense ventrally, and the legs and ventral surface are brown. Small supraspiracular scoli are present on all segments except T1 and A9, and that on T2 has lateral spines. Subdorsal scoli are brown and largest on T2, T3, A2 and A8, bearing many white, black-tipped thick conical spines, while remaining scoli are absent on T1, tiny on A1, larger on A3, A5, A8 and A10, and largest on A4 and A7. The spiracles on T1 are faintly black rimmed, others are the same colour as the body. The head capsule is flattened and not noticeably bilobed, unlike *Limenitis*, which has a deep dorsal groove at the median suture. The face is almost smooth with only a few granulations, but has a lateral double row of long spines, most prominent dorsally, which are yellowish white with the exception of a pair of black dorsal spines. The colour is brown on the face, paler laterally and ventrally, with a tapering whitish band over the ocelli and another faded band on each side of the clypeus. The labrum is white and the ocelli black. Just before pupation the larva fades to a uniform straw-yellow. This description was repeated in abbreviated form by several subsequent authors (Comstock, 1927; Howe, 1975; Dornfeld, 1980; Scott, 1986, possibly also referring to *A. b. eulalia*), most of whom remarked upon the effective camouflage of the larva against the hostplant leaves. Comstock (1927) figured the pupa, which is morphologically similar to *A. b. eulalia*, but with longer head horns and less pronounced dorsal projections on T2 and A2. The pupa is pale brown to pale straw yellow, with variable streaks and patches of darker brown and metallic gold areas laterally on the thorax and posterior to the eyes, and is attached to tree trunks by a large silken web, “not less than half an inch in diameter” (Edwards, 1873; Comstock & Dammers, 1932).

The first instar builds a leaf perch, presumably from the mid-rib, similar to other *Adelpha*. Second to fifth instars rest in the Front-Arched-Rear-Up position (Dyar, 1891; Comstock & Dammers, 1932: pl. 26c). The duration of the various stages under laboratory conditions was given by Comstock & Dammers (1932) as follows: egg, 11 days; 1st instar, 9 days; 2nd instar, 8 days; 3rd instar, 4 days; 4th instar, 9 days; 5th instar, 14 days; pupa, 10 days; total development time, 65 days.

Habitat and adult ecology: Comstock (1927) reports that this subspecies is frequently seen gliding high among the branches of the oak tree hostplant. Males often gather in small groups to feed at moist sand along streams, typically in the middle of the morning, and rare individuals have been recorded feeding on flowers. They have also been observed feeding on grape squeezings (Emmel & Emmel, 1973). In California, there are two broods, with adults flying from April to June and again from August to September (Emmel & Emmel, 1973; Orsak, 1977), while Comstock (1927) reports that the flight season varies somewhat with altitude. According to Christensen (1981), this subspecies frequents oak, pine and Douglas-fir woodlands of western Oregon from mid-June to mid August, while Dornfeld (1980) reports it flying from May to October, but that it is most numerous in mid to late summer. Both of these comments suggest that the subspecies may have only a single brood in Oregon. Several of the comments of Scott (1986) may apply to either this subspecies or *A. b. eulalia*, and are mentioned under the latter taxon. Carpenter & Hobby (1945) list additional older works in which there are observations of the adult natural history.

Poulton (1908, 1909) suggested that this subspecies is involved in mimicry with *Limenitis lorquini*, with which it flies throughout its range. This is indeed possible; of the three subspecies of *A. bredowii*, the nominate appears to have the most plesiomorphic wing pattern, through comparison with the most closely related species, *A. diocles*. The hindwing is still relatively elongate and angular, the postdiscal series on the VFW are more extensive and not so broadened as in the remaining two subspecies and the inner postdiscal series on the VHW is still present (also true of *A. b. eulalia*). Although *A. b. californica* has a second VHW orange discal cell band, a primitive character, I interpret this as a reversal since it is otherwise absent in all members of the *A. serpa* group, and also occurs occasionally in *A. b. eulalia*. It is therefore clear that several features that enhance the resemblance of *A. b. californica* to *L. lorquini*, such as the more rounded wings and displaced white DFW postdiscal spots, are derived characters, as would be predicted if *A. b. californica* and *L. lorquini* are involved in mimicry.

Specimens examined (494♂, 222♀):

USA (490♂, 221♀): *Arizona*: "Prescott" 1♀ USNM-error; no specific locality (Escalante) Jun. 1♀ AME, 1♀ MNHN-error?; *California*: Atascadero Apr. 3♂ AMNH; Angeles Forest 2500' Jun. Sep. 7♂, 1♀ AMNH, 1♂, 1♀ MUSM; Auburn May 1♂ AME; Bald Mt. Rd. Humboldt Co. Jul. 2♂ FSCA; Bangor Sep. 1♀ USNM; Barton Flats San Bernadino Co. Jun. Jul. 2♂, 1♀ FSCA, 1♂ AME; Bear Valley May 2♂ USNM; Berkeley Aug. 1♂ USNM, 3♂, 1♀ AMNH; Big Basin State Park Jul. 1♂, 1♀ FSCA; Bonneville Jun. 1♂ AMNH; Boulder Creek Apr. 1♀ AMNH; Bronville Jun. 1♀ AMNH; Camp Baldy 1♂ MCZ; Camp Nelson Jul. 1♂ AMNH; Capitan Res. S. Diego Co. Aug. 1♀ FSCA; Carrista Creek S. Diego Co. 1♀ AME; Carrville 1♂ AMNH; Carson Pass Alpine Co. Jun. 1♂ AME; Cedar Grove 1♂ AMNH; Cedar Pine Aug. 1♂ USNM, 2♂ AMNH; Chews Ridge Monterey Jun. 2♂, 4♀ AMNH; Coal Creek Canyon Jun. 1♀ BMNH; Collins Ranch Aug. 1♀ AMNH; Cottonwood Camp 1♂ USNM; Crestline 1♀ USNM; Cuyamaca Rancho State Park Jul. 2♂ USNM, 2♂, 1♀ AMNH, 3♂ FSCA; Davis Creek 1♀ USNM; Descanso May 1♂ USNM, 2♂ AMNH; Devil's Gulch Jun. 7♂, 5♀ AMNH; nr. Downieville Oct. 1♀ AME; Dulzura Oct. 1♀ AMNH; Dunsmuir May 1♀ AMNH; Eaton Canyon Jul. 1♀ BMNH; Echo Mts. Jul. 1♂ BMNH; El Cajon S. Diego Co. Jul. 1♀ FSCA; Elizabeth Lake Canyon Aug. 1♂ FSCA; El Monte S. Diego Co. Aug. 2♀ FSCA; El Portal May 1♂, 1♀ AMNH; Elsinore 1♂ AMNH; Fairfax Jun. Jul. 3♂ AME; Figueroa Mt. 1♀ AMNH; Frazier Park Ventura Co. 2♂ AME, 1♂ AMNH; French Gulch Jun. Jul. 4♂ USNM; Geysers Jun. 1♂ AMNH; Glendale Mar. May Oct. 2♀ BMNH, 2♂ FSCA, 1♂ AMNH; Glendora May 3♂ USNM; Gold Creek May 2♂ AME; Horn Mts. Kern Co. 1100' Apr. Jun. 1♂, 1♀ AME; Humboldt 12 mi. E. Orick Jul. 1♂ AME; Idyllwild Aug. 1♂ FSCA, 1♂ AMNH; Indian Flat Mariposa Co. May 1♂ AME; Jerseydale 3500' Jul. Aug. 17♂, 6♀ AMNH, 2♂, 1♀ AME, 1♂ FSCA; Julian 1♂ AMNH; Kings Mt. Jul. 1♀ AME; Laguna Mts. Jul. 1♂ AME; Lake Hobergs 1♂ USNM; E. Lakeside S. Diego Co. Mar. 3♀ FSCA; La Tuna Canyon Mar.-May Aug.-Oct. 5♂, 5♀ AME; Laurel Canyon Jun. 2♂ BMNH; Laytonville Aug. 1♀ AMNH; Lime Kiln Apr. 3♀ AME; Livermore, 8 mi. S., Jun. 1♂ USNM; Livermore, 20 mi. S., Jun. 1♂ AME; Lopez Canyon Jun. 1♀ AMNH; Los Angeles Apr.-Jun. Sep. 5♂ BMNH, 2♂, 1♀ USNM, 8♂, 5♀ AMNH, 2♂ AME; Los Banos Jun. 2♂, 2♀ AMNH; Macho Canyon May 1♂, 1♀ AMNH; Marin Co. Jun. 2♂, 1♀ USNM; Mariposa Co. May Aug. 1♂, 3♀ AMNH; Marton Peak San Bernadino 3300' Jul. 4♂ AME; Marysville Jun. 1♂ USNM; nr. McCloud Mt. Shasta 3500' Jun. 3♀ AME; Mendocino Mts. May Jun. 1♀ USNM, 2♂ AMNH; middle California 4♂, 3♀ USNM; Middle Fork Butte Jun. 2♂, 1♀ USNM; Middleton Jun. 1♂ USNM; Mill Creek Canyon San Bernadino Mts. Jun. 1♂ AME, 1♂ FSCA; Mill Valley May 1♀ AMNH; Mineral King Jun. 1♂ USNM; Mint Canyon May 1♂ AME; Miramar Feb. 1♂ USNM; Miranda Aug. 1♀ AMNH; Mirror Lake Jan. Jul. 1♂ USNM, 1♀ AME; Monterey Jun. Aug. 4♂ FSCA, 1♂ USNM; Morbon Park Jul. 1♂ AME; Mt. Diablo May 1♂ AME, 1♂ AMNH; Mt. Laguna San Diego Co. 1♂ FSCA, 1♂, 3♀ AMNH; Mt. Lowe Aug. 9♂, 4♀ BMNH; Mt. Tamalpais Jun. 1♀ AMNH; Mt. Wilson Jun. Aug. 1♀ BMNH, 2♂ USNM; Nevada Co. Jul. 1♂ USNM; Newhall Hills Jun. 1♀ BMNH; Orange Co. Jun. 1♀ AME; nr. Ojai, Lion Creek May 2♂ FSCA; Oso Canyon San Rafael Mts. Mar. 1♂ AME; Palo Alto Jun. 1♂, 1♀ USNM, 1♂ AMNH; Palomar 5-5300' Jun. Jul. 9♂ AME, 1♀ AME, 1♀ FSCA, 5♂, 2♀ AMNH; Panther Creek Salt Springs Amador Co. Jun. 1♂ FSCA; Patterson, 22 mi. W., Stanislaus Co. May 2♂ AME; Pasadena Aug. 1♂ USNM; Pepperwood Humboldt Co. Jul. 2♀ FSCA; Petaluma 1♂ AMNH; Pfeiffer State Park Monterey 1♀ FSCA; Placerville Feb. Nov. 1♂ BMNH, 1♀ AMNH; Plumas Co. Jul. 1♀ USNM, 1♀ AMNH; Pinnacles Nat. Mon. Apr. 1♂ AMNH; Pom Mts. Sep. 1♂ MCZ; Potrero, 2 mi. N., S. Diego Co. Jul. 2♂ FSCA; Quincy 3400' Jun.-Sep. 7♂, 3♀ BMNH; River side Co. May 1♂ AMNH; Rubio Canyon May 1♂ USNM; W. of St. Helena Jul. 1♀ FSCA; San Bernadino Mts. May Jun. Sep. 3♂, 1♀ BMNH, 4♂ USNM, 2♀ AMNH, 1♂ MCZ; San Berdo Co. 1♂ AMNH; San Diego May-Aug. 2♂ MCZ, 1♂ BMNH, 3♂, 4♀ AMNH, 1♂ AME; San Francisco 3♂ AME, 1♀ USNM; San Gabriel Mts. Jun. 22♂, 7♀ AMNH, 2♂ AME; San Isabel Creek Volcan Mts. San Diego Co. 3000' Jun. 2♂ AME; San José 1♂ AME; San Mateo Jun. 1♂ AME, 1♂ AMNH; San Rafael May 1♂ BMNH; upper Santa Ana River 1♂ AMNH; Santa Barbara Co. 3800' Jun.-Aug. 6♂ AME; Santa Clara Co. Aug. 1♀ FSCA; Santa Cruz May Jun. Aug. 1♀ BMNH, 1♂, 2♀ USNM; Santa Elena 2♀ AMNH; Santa Monica Mts. May 1♂ FSCA, Jul. 2♂ AMNH; Saratoga 1♂ AMNH; S. California 1♂ USNM; Seven Oaks San Bernadino Jul. 1♂, 1♀ AME; Shasta 3500' Jun. Aug. 69♂, 6♀ BMNH, 2♀ USNM, 2♂ AMNH, 1♂ AME; Shirley Meadows, summit Green Horn Mts. 6700' Jun. 1♀ AME; Sierra City 4000' Jun. Jul. 1♂, 1♀ AME; Silocredo Canyon Orange Co. Jun. 1♂ AME; Snow Creek Mar. 1♀ AME; Springville Jun. 1♂ AMNH; Stunt Canyon LA Co. Apr. 1♂, 1♀ FSCA; Tehachapi Jul. 1♂ AME; Tehachapi Mt., Kern Co. 5600' Jun. Jul. 1♀ AME, 4♂ BMNH, 2♂ USNM; Tanbark Co., LA Co. Jul. 1♀ FSCA; Thompson Canyon, Yolo Co., Vaca Mts. May 3♂, 7♀ AME; Trinity Butte 3♂ AMNH; Trinity Co. Jun. 1♂ FSCA; Trobuco Canyon Orange Co. Jun. 2♂ FSCA; Tuolumne Co. Jun. Aug. 3♂ AMNH; Two Rock 1♂ AMNH; Ukiah May 1♂, 1♀ USNM; Wahwonga May 1♀ BMNH; Walsingham 1♂ BMNH; Waterman Canyon, San Bernadino Mts. May 1♂ AME; Watsonville 1♂ BMB; Willits Aug. 1♂ AMNH; Winchester Jul. 2♂ BMNH; Woodside Jul. 1♂ USNM; Yosemite 4000' May-Aug. 6♂, 4♀ BMNH, 3♂, 6♀ USNM, 8♂, 1♀ AMNH, 5♂, 1♀ AME; upper Yuba Res. May 1♂ USNM; Yucaipa Jul. 1♂, 4♀ AME; no specific locality Jun. Jul. 8♂, 9♀ BMNH, 1♂ BMB, 1♂, 7♀ MNHN, 4♂, 4♀ USNM, 8♂, 6♀ AMNH, 1♂ MCZ; *Oregon*: Brookings, Vulcan Mts. Jul. 1♂ AME; Butte Falls Jul. 3♂ USNM; Central Point Apr. 1♀ BMNH; Corvallis Jul. 1♂ USNM; Eugene Sep. 4♂ AME; Gold Hill Jackson Co. Jul. Sep. Oct. 5♂ BMNH, 1♂ FSCA; Goose Lake Jul. 1♂ USNM; Jacksonville Aug. 3♂, 2♀ AME; McMinnville Sep. Oct. 1♂ BMNH, 6♂ USNM; Mt. Ashland 1♂ AME; Oregon 2♂ AMNH; Roseburg 2♂ MCZ; Salem Jul. 1♀ USNM; San Mateo Jun. 1♂ AME; Sissons May Aug. 2♂, 2♀ BMNH; Wolf Creek Aug. 1♂ AME; "*Utah*": no specific locality 1♂, 1♀ USNM-error; *Not located*: Abigua Creek Jul. 2♂ USNM; N. America 2♀ BMNH; no specific locality 7♂, 6♀ MCZ, 3♂, 4♀ BMNH, 1♂, 1♀ MNHN, 7♂, 4♀ USNM. **COUNTRY UNKNOWN** (3♂, 1♀): no specific locality 2♂ AME, 1♂, 1♀ FSCA. "**HONDURAS**" (1♂): no specific locality 1♂ MCZ-error.

Additional locality data: **USA**: see Carpenter & Hobby (1945). **MEXICO**: *Baja California Norte*: Sierra de Juárez; Sierra San Pedro Mártir, numerous localities and map (Brown *et al.*, 1992).

Adelpha diocles Godman & Salvin, 1878

Figs. **33**; 125; 209; *281*

Identification, taxonomy and variation:

This is a very distinctive species, characterised by the short "tail" on the hindwing at vein Cu_2, the evenly edged orange DFW subapical marking and the even, almost continuous silvery white inner and outer submarginal series on the VFW. The ventral ground colour, length of the hindwing "tail" and shape of the DFW orange subapical marking vary geographically, and two subspecies are recognised.

This species is the only member of the *Adelpha serpa* group not to have a third cell bar in the VFW discal cell, but it has all of the defining synapomorphies of the group. It is closely related to *A. bredowii*, as indicated by characters of the male and female genitalia.

Range and status: Mexico to western Panama in montane areas. Very local but not uncommon in cloud forest, from 1400m to 3000m.

Specimens examined: 37 (26♂, 11♀)

Adelpha diocles diocles Godman & Salvin, 1878

Figs. **33a,b**; 125a; *281*

Adelpha diocles Godman & Salvin (1878a: 270)

TL: Volcán Chiriquí [Panama]. **Types**: **BMNH**(T): **ST**♂: “B.M. TYPE No. Rh. 9851 Adelpha diocles ♂ G. & S.//4 93//B.C.A. Lep. Rhop. Adelpha diocles G. & S. Godman-Salvin Coll. 1916.-4.//Type. sp. figured//V. de Chiriquí Arce//Chiriquí Panama Arce//♂. Type H.T.” [examined]

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. d. creton* by having shorter hindwing “tails”, a narrower DFW orange subapical marking of more even width, a white DFW postdiscal band that does not extend into cell M_3-M_2, reddish brown instead of dark brown ventral ground colour in the distal half of the wings, and a white VHW postdiscal band of more even width, which does not taper from cell M_1-Rs to the costa. There is little variation in specimens examined.

Godman & Salvin (1878a) described this species from an unspecified number of males in their collection collected by Arcé on Volcán Chiriquí, and a syntype male is in the BMNH (Fig. 33a,b). It was subsequently figured by Godman & Salvin (1884), but the species appears to have been unknown to Fruhstorfer (1915).

Range: This taxon is known only from the Chiriquí massif in eastern Costa Rica and western Panama, although it possibly also extends into Nicaragua, given the range of *A. tracta*, which occurs in similar montane habitats.

Habitat and adult ecology: The only published observations of this subspecies in nature are those of DeVries (1987) in Costa Rica, and they are summarised here. He reports that it occurs from 2000-3000m in cloud forest, while museum specimen data indicate that it also occurs as low as 1400m. Adults appear to be very local and seasonal, though they may be abundant during the main dry season (February to March), and generally fly at the canopy level. Two male specimens in the AMNH were apparently attracted to lights at night.

Specimens examined (14♂, 1♀):

COSTA RICA (4♂): *Alajuela*: Cascajal Jan. 1♂ BMNH; Volcán Poás 1♂ USNM; *Puntarenas*: Las Alturas 4700' Mar. at light 2♂ AMNH. **PANAMA** (10♂, 1♀): *Chiriquí*: Chiriquí 1♂ BMNH; Volcán Baru 1700-1800m Dec.-Feb. 1♂ FSCA, 8♂, 1♀ USNM.

Adelpha diocles creton Godman, 1901

Figs. 2m; **33c,d**; 125b; 209a-c; *281*

Adelpha creton Godman (1901: 692, pl. 109, fig. 1, 2)

TL: Jalapa, Mexico. **Types**: **USNM**: **ST**♀: “A. creton Godm. ♀ type//Type No. 850 [?]//sp. figured//Collection W. Schaus//Jalapa, Mex.” [examined]

Heterochroa creton G. & S., Hoffmann (1940); *Adelpha diocles* Godm., Steinhauser (1974), D’Abrera (1987); *Adelpha diocles creton* Godm., de la Maza *et al*. (1989), de la Maza & de la Maza (1993)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate as detailed in the account of that taxon. There is little variation in the specimens examined except in the extent to which the white DFW postdiscal band extends into the posterior half of cell M_3-M_2, where it may solidly fill the area or consist of diffuse scaling.

This subspecies was figured in colour and described by Godman (1901) from an unspecified number of females collected by Schaus in Mexico. A syntype female is in the USNM (Fig. 33c,d). It was initially described as a species distinct from *A. d. diocles* on the basis of several of the characters listed above as distinguishing the two taxa, and Miller & Miller (1970) retained the two as distinct species stating that “the genitalia suggest that the two species should be kept separate”. However, they provided no evidence in support of this assertion, and since I have been unable to find any consistent differences in the genitalia and the two taxa do not differ substantially in wing pattern, morphology or habitat, in addition to being allopatric, I follow de la Maza *et al*. (1989) and de la Maza & de la Maza (1993) in regarding *creton* as a subspecies of *A. diocles*.

Range: Montane areas from Mexico to Guatemala and El Salvador. Almost certainly more widespread, extending into Honduras, and possibly Nicaragua.

Habitat and adult ecology: Miller & Miller (1970) provide an interesting account of the behaviour and habitat of this species in Mexico. They captured 15 specimens and observed many others over several months in mixed pine-oak habitat in the vicinity of La Encarnación, between 2400m and 2450m. In agreement with the observations of the nominate subspecies by DeVries (1987) in Costa Rica, adults typically remained high among the crowns of trees, especially oak, only occasionally descending to puddle at damp soil, and then remaining very wary. The close association of the adults with oak trees led them to speculate that the hostplant might be in this family, and indeed this would be expected from the close relationship of *A. diocles* and *A. bredowii*. In Mexico, de la Maza & de la Maza (1993) report the species occurring in Chiapas from 1800-2700m in humid temperate forests in the Macizo Central and Sierra Madre areas, while de la Maza (1987) reports records from August to March.

Specimens examined (12♂, 10♀):

MEXICO (12♂, 9♀): *Chiapas*: Mt. Huitepec Apr. 1♀ AME; San Cristóbal de las Casas Feb. Mar. 6♂ FSCA, 1♀ AME; *Hidalgo*: La Encarnación 2400-2450m oak-pine forest Jan.-Mar. 2♂ BMNH, 3♂, 5♀ AME; Zimapán Feb. Mar. 1♂, 1♀ AME; *Veracruz*: Jalapa 1♀ USNM. **GUATEMALA** (1♀): *Quezaltenango*: Volcán Santa María Oct. 1♀ USNM. **EL SALVADOR** (1♀): *Santa Ana*: Metapán 2300m Dec. 1♀ AME.

Additional locality data: **MEXICO**: *Chiapas*: Macizo Central; Sierra Madre (de la Maza & de la Maza, 1993); Huitepec; *Guerrero*: Filo de Caballo; Teotepec; *Oaxaca*: La Esperanza (de la Maza, 1987).

Adelpha herbita Weymer, 1907

Figs. **34a,b**; *281*

Adelpha herbita Weymer (1907: 21, pl. II, fig. 7)

TL: Santa Catharina, Brazil. **Types**: **Collection unknown**: **HT**♀: [not located]

Identification, taxonomy and variation:

Adelpha herbita is a very distinctive, primitive and enigmatic species, to date only known to my knowledge from the holotype female. It is distinguished from *A. zea*, which it closely resembles on the dorsal surface, by having a complete and distinct white postdiscal band extending to the costa on the VFW (this band is fused entirely with the subapical marking in *A. zea*), complete inner and outer submarginal series on the VFW (these are reduced or absent in cell M_3-M_2 in *A. zea*), the subapical marking remaining distinct from the white postdiscal band in cells Cu_2-Cu_1 and Cu_1-M_3 of the VFW, and no reddish bands distal or basal of the white postdiscal band on the VHW. The combination of the latter two characters also distinguishes the species from all other *A. serpa* group members.

Weymer (1907) described this species carefully and at length from a single female in his own collection, and the original illustration of the dorsal and ventral surface of half wings (Fig. 34a,b) shows great attention to detail, notable in the shape of the second VFW discal cell bar which exactly matches other *A. serpa* group members. However, to date the whereabouts of the holotype female specimen is unknown, and neither myself nor Gerardo Lamas (pers. comm.) have seen further specimens in any collections. Fruhstorfer (1915) also knew only of the holotype, and I am informed by Olaf Mielke (pers. comm.) that there are no specimens in the collections of the UFP, which has extensive *Adelpha* material from Santa Catharina, the type locality. It has been suggested to me that the holotype is actually an aberration, but I do not believe this to be the case. In fact, *A. bredowii* also shares the loss of the outer postdiscal series on the VHW except for cell 2A-Cu$_2$, exactly as depicted in the original illustration of *A. herbita*, while *A. diocles* has much reduced reddish coloration basal of the VHW white postdiscal band, similar to *A. herbita*. I cannot believe that the number and combination of distinctive wing pattern characters in evidence in the original illustration could have arisen from any other known *Adelpha* simply as an aberration. Rather, these characters suggest that this is a very primitive species closely related to *A. bredowii* and *A. diocles*. If this is the case, then its presence in southeastern Brazil, far removed from these two Central to North American species, is of great evolutionary interest.

Range: Currently the range of this species is not known with any certainty, but it probably occurs in the states of Santa Catharina and Paraná in southeastern Brazil.

Habitat and adult ecology: There is no published information on the natural history of this primitive and extremely rare species. From what is known of the ecology of related species, I would expect it to be confined to montane areas, some of which extend above 1800m, in the state of Santa Catharina (e.g., the Serra Geral) and possibly Paraná. Given that *A. herbita* appears to have been unreported since the capture of the holotype, any information on additional specimens or field observations would be of great value, since the species should probably be considered Endangered (see Conservation in introduction).

Specimens examined: NO SPECIMENS KNOWN.

Adelpha zea (Hewitson, 1850)

Figs. **35a,b**; 126a,b; 210a-c; *281*

Heterochroa zea Hewitson (1850: 435, pl. IX, figs. 1,2)

TL: Rio de Janeiro [Brazil]. **Types**: **BMNH**(T): **ST**♀: “Heterochroa zea Hewitson Syntype det. R.I. Vane-Wright 1983//B.M. TYPE No. Rh. 9850 Heterochroa zea ♂ Hew.//Brazil Hewitson Coll. 79-69 Heterochroa zea. 2.//zea//Type//Syntype”; **BMNH**(M): **ST**?♀: “Braz.//Brazil Hewitson Coll. 79-69 Heterochroa zea. 1.” [both examined]

=*Adelpha zea serpentina* Fruhstorfer (1915: 532)

TL: Santa Catharina [Brazil]. **Types**: **BMNH**(T): **ST**♂: “Fruhstorfer Coll. B.M. 1937-285//zea serpentina Fruhst.//Brasilien St. Cath. Fruhstorfer//TYPE//Type//Syntype”; **ST**♀: “Fruhstorfer Coll. B.M. 1937-285//Brasilien St. Cath. Fruhstorfer//TYPE//Type”; **BMNH**(M): **ST**♀: “serpentina Fruhst.//Brasilien St. Catharina Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285” [all examined]

=*Adelpha zea tarpeia* Fruhstorfer (1915: 532)

TL: Paraguay, Rio Grande do Sul [Brazil]. **Types**: **BMNH**(T): **ST**♀: “Fruhstorfer Coll. B.M. 1937-285//zea tarpeia Fruhst.//Rio Grande Brasil ex Coll. H. Fruhstorfer//TYPE//Type//Syntype”; **BMNH**(M): 2**ST**♀: “Rio Grande Brasil Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285”; **BMNH**(R): **ST**♂: “TYPE//Sapucay, Paraguay, 19.VIII.06 (W. Foster)//zea tarpeia Fruhst.” [all examined]

Adelpha zea Hew., Kirby (1871)

Identification, taxonomy and variation:

Adelpha zea is most similar in dorsal wing pattern to *A. paroeca*, but is distinguished by the orange postdiscal marking touching the white postdiscal spot in cell Cu$_1$-M$_3$, with no dividing thin dark brown line, and on the VHW by the dark red band basal of the white postdiscal band extending only into the anterior half of cell 2A-Cu$_2$, instead of to vein 3A, and the dark line along vein 3A extending to the wing base instead of to the costal margin. *Adelpha hyas hyas* is also similar on the dorsal surface but the ventral surface is markedly distinct. Characters that differentiate this species from *A. herbita* are discussed under the latter species. There is very minor individual variation in the width of the white dorsal postdiscal bands.

The name *zea* was first introduced as a *nomen nudum* by Westwood (1850) in his list of *Adelpha*, and illustrated and described shortly after in characteristic detail by Hewitson (1850), based on an unspecified number of specimens in his own collection. I have examined a syntype female in the BMNH(T) and a further possible syntype in the BMNH(M), which differs slightly from the former only in having a few orange scales at the DFW discocellulars. Fruhstorfer (1915) described two further subspecies, *serpentina*, from an unspecified number of specimens from Santa Catharina (Fig. 35a,b), and *tarpeia* (later illustrated and misspelt *tarpeja* (Fruhstorfer, 1920: pl. 110A,b)), based on two males from Paraguay in the Tring Museum and three females from Rio Grande do Sul in his own collection. The putative differences in the width of the white dorsal postdiscal band, orange DFW subapical marking and brightness of the red bands on the VHW are barely apparent in any of the specimens of the syntypic series examined for either taxa, or indeed in any specimens of *A. zea*, and Hall (1938) correctly synonymised both names with *A. zea*. Although Fruhstorfer (1915) and several subsequent authors treated *A. paroeca* as a subspecies of *A. zea*, the two are clearly distinct species as discussed under the former species.

Range: Southeastern Brazil, as far east as Espírito Santo, to Paraguay, northeastern Argentina and Uruguay.

Habitat and adult ecology: Ebert (1969) found this species to be not uncommon in Minas Gerais in low canopy forest in hilly areas, up to 1400m, while records from Iguaçu and Pelotas suggest it occurs down to 200m, or lower. Hoffmann (1936) observed the species in Santa Catharina feeding fairly commonly at flowers of various Asteraceae in March and April, and Biezanko (1949) also reported it (as *Adelpha tarpeia*) from January to April in Rio Grande do Sul, where it was said to be uncommon. Otherwise, nothing has been published on the ecology of this species and judging from museum specimens it is generally uncommon in the field.

Specimens examined: 66 (29♂, 37♀)

“**COLOMBIA**” (1♀): no specific locality 1♀ BMNH-error. **BRAZIL** (22♂, 32♀): *Espírito Santo*: no specific locality 1♀ BMNH; *Paraná*: Castro 4♂, 2♀ BMNH; Fernández Pinheiro 2600' Apr. 1♀ BMNH, 1♀ AME; Iguaçu Oct. 1♂ BMNH; N. Paraná 4♂, 1♀ AMNH; Ponta Grossa 3500' Dec. 2♂, 1♀ BMB; União da Vitória 2400' Apr. 1♀ AME; *Rio de Janeiro*: Teresópolis 1♂ BMNH; *Rio Grande do Sul*: Pelotas Jan. Mar. Apr. 2♂, 5♀ MCZ; Rio Grande do Sul 1♂, 3♀ BMNH, 2♀ ZMHU; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 1♀ FSCA; Trombudo Alto May 1♂ AME; no specific locality 2♂, 3♀ BMNH, 1♂ ZMHU, 1♂, 1♀ BMB, 6♀ AMNH; *São Paulo*: Casa Branca 1♂, 1♀ ZMHU; *Not located*: no specific locality 2♀ BMNH, 1♂ AMNH. **PARAGUAY** (4♂, 3♀): *Caaguazu*: Yhú Sep.-Dec, 1♂ BMNH; *Paraguarí*: Sapucay Sep. 2♂, 2♀ BMNH; *Not located*: no specific locality 1♂, 1♀ MCZ. **COUNTRY UNKNOWN** (3♂, 2♀): no specific locality 3♂, 1♀ BMNH, 1♀ MNHN.

Additional locality data: **BRAZIL**: *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *Rio Grande do Sul*: Monte Bonito Jan.-Apr. (Biezanko, 1949); *Minas Gerais*: Poços de Caldas 1300-1400m May (Ebert, 1969). **ARGENTINA**: *Misiones* (Hayward, 1951). **URUGUAY**: no specific locality (Biezanko *et al*., 1978).

Adelpha paroeca (H. W. Bates, 1864)

Figs. **36**; 127; 211; *281*

Identification, taxonomy and variation:

Adelpha paroeca is distinguished from the similar *A. nea sentia* by having an orange postdiscal spot on the DFW in cell Cu$_1$-M$_3$ distinct from the white postdiscal spot, and the white postdiscal spot in cell Cu$_2$-Cu$_1$ on the VFW being slightly narrower than the spot in 2A-Cu$_2$, instead of half as wide again (i.e., the postdiscal band and series are not fused). In addition, the upper postdiscal band and postdiscal series on the VFW are not separate. *Adelpha zea* has the pale orange postdiscal marking on the VFW in cell Cu$_1$-M$_3$ fused with the white postdiscal band, instead of separate, and the reddish band basal of the white VHW postdiscal band has a different configuration, not reaching vein 3A. The shape of the postdiscal band on the ventral surface is also distinctive, being inclined in cell Cu$_1$-M$_3$ on the forewing, and curving distally on the hindwing on reaching the costa; both of these characters distinguish the species from *A. paraena*, while *A. paraena massilia* additionally lacks an orange postdiscal marking on the DFW in cell Cu$_1$-M$_3$. All other similar *A. serpa* group members have the white submarginal series on the VFW consisting of paired spots instead of single dashes in each cell space.

There is variation in the width of the white dorsal postdiscal bands, the width and extent of the orange DFW subapical marking, the width of the ventral submarginal series, the ventral ground colour, the amount of orange-brown colouring basal of the white postdiscal band on the VHW, and the expression of the postdiscal series on the DHW, and two subspecies are recognised.

The extension of the first cell bar on the VHW to vein 3A is a synapomorphy which groups this species with the more derived *A. serpa*-group members following this account, indicating that *A. paroeca* is not the sister species of *A. zea* (as might be expected given that several authors have treated the two as conspecific) but is more closely related to *A. nea* and *A. paraena* (Willmott, 1999, in prep.).

Range and status: Mexico to western Colombia, probably to northwestern Ecuador, in lower montane forest habitats, from 800m to 2300m. Generally uncommon in Central America and very rare in South America.

Specimens examined: 78 (40♂, 38♀)

Adelpha paroeca paroeca (H. W. Bates, 1864) **stat. rest.**

Figs. **36a-d**; 127; 211a,b; *281*

Heterochroa paroeca Bates (1864: 127)

TL: Guatemala, central valleys. **Types**: **BMNH**(T): **ST**♀: "Heterochroa paroeca Bates ♀ Syntype det. R.I. Vane-Wright 1983//B.M. TYPE No. Rh. 9849 Heterochroa paroeca ♀ Bates//B.C.A. Lep. Rhop. Adelpha paraeca Bates Godman-Salvin Coll. 1916.-4.//Heterochroa paroeca Bates//♀//Centr. Valleys Guatemala F.D.G. & O.S.//Guatemala Central Valleys//Type H.T."; **BMNH**(M): **ST**?♀: "Centr. Valleys Guatemala F.D.G. & O.S.//♀//Central Val. Type sp. figured//B.C.A. Lep. Rhop. Adelpha paraeca Bates Godman-Salvin Coll. 1916.-4." [both examined]

=*Heterochroa emathia* Felder (1869: 473) **stat. rest.**

TL: Potrero [Mexico]. **Types**: **BMNH**(R): **ST**♂: "481//Mexico Terra cal. Milimet//H. emathia Feld.//Omathia [sic] n.//Type" [examined]

Adelpha serpa var. *paroeca* Bates, Kirby (1871); *Adelpha serpa* var. *emathia* Fldr., Kirby (1871); *Adelpha zea paroeca* Bates, Fruhstorfer (1915), de la Maza & de la Maza (1993); *Adelpha zea emathia* Fldr., Fruhstorfer (1915), de la Maza & de la Maza (1993); *Limenitis (Adelpha) paroeca* Bates, Ross (1976) (actually *A. serpa celerio*); *Adelpha zea* ssp. de la Maza & de la Maza (1993).

Identification, taxonomy and variation:

Adelpha p. paroeca is distinguished from the recently described *A. p. pseudodonysa* under the account of that subspecies. There is some variation in the width of the white dorsal postdiscal bands and the width of the orange DFW subapical marking, both tending to be narrower in specimens from Nicaragua to Panama (Fig. 36a-d). In addition, specimens from Costa Rica and Panama often have more orange-brown colouring in the band basal of the white VHW postdiscal band, orange-brown ventral ground colour in the distal half of the wings and the silvery white markings of the ventral submarginal series reduced in size (Fig. 36c,d). However, all of these characters seem to vary individually and are best ascribed to clinal variation throughout Central America.

Adelpha paroeca was described in detail by Bates (1864) in comparison with *A. serpa*, from a male specimen or specimens from Guatemala. The putative syntype and second possible syntype in the BMNH are, however, females, but otherwise agree with the original description so it appears that Bates simply misidentified the sex. Felder (1869) described the taxon *emathia* from an unspecified number of male specimens as a full species, and the syntype is in the BMNH (Fig. 36a,b). However, since he failed to mention the recently described *A. paroeca* it must be assumed that he was unaware of the description. The two taxa were both placed as "varieties" of *A serpa* by Kirby (1871), while Fruhstorfer (1915) treated both names as subspecies of *A. zea*. I have not found any consistently different phenotypes within *A. paroeca* that I believe merit subspecific recognition and so synonymise *emathia* with *A. paroeca* (**stat. rest.**), as first proposed by Godman & Salvin (1884).

Adelpha p. paroeca has been, and still is, sometimes treated as a subspecies of *A. zea* (Fruhstorfer, 1915; DeVries, 1987; de la Maza & de la Maza, 1993), despite the great range disjunction between the two taxa, although it has also been accorded specific status by a number of authors (Godman & Salvin, 1884; D'Abrera, 1987; Lamas & Small, 1992). The differences in wing pattern discussed above, and in the female genitalia, show that the species are clearly very distinct, and I restore *A. p. paroeca* to full species status (**stat. rest.**).

Range: Mexico to western Panama.

Habitat and adult ecology: This species is found in lower montane rain to cloud forest habitats, where it appears to be uncommon. DeVries (1987) reports it in Costa Rica from 900m to 1500m, while de la Maza & de la Maza (1993) record it in Chiapas, Mexico, from 800m to 2300m, in hot to temperate semi-humid forests. No information has been published on its behaviour or early stage biology.

Specimens examined: 77 (40♂, 37♀)

MEXICO (22♂, 14♀): *Chiapas*: Comitán Sep. 1♂, 1♀ AME; Las Delicias Oct. 2♂ AME; Ocozingo Apr. Jun. 2♂ AME; Pichucalco May 1♀ AME; no specific locality 2♀ AMNH; *Guerrero*: Acahuizotla Feb. Aug. 2♂ AME; *Nayarit*: Compostela Oct. 1♀ AMNH; *Nuevo León*: Cola de Caballo Oct. 1♂ AME; *Oaxaca*: Oaxaca, 192 km from, 1♂ AMNH; *Puebla*: Villa Juárez 1♀ AME; *Veracruz*: Córdoba Aug. 3♂, 1♀ BMNH, 1♀ USNM; Jalapa 4600' Nov. 1♂ BMNH, 2♂, 1♀ USNM, 3♂, 1♀ BMB; Presidio 1♂, 2♀ AME; Vera Cruz 1♀ ZMHU; *Not located*: Terra Caliente 2♂ BMNH; no specific locality 1♂ AME, 1♀ AMNH. **GUATEMALA** (6♂, 13♀): *Alta Verapaz*: Baléu 1350m Sep. Nov. 1♂, 2♀ AMNH, 1♂ AME; *Baja Verapaz*: San Jerónimo 1♂, 3♀ BMNH; *Guatemala*: Guatemala City 4-5000' Sep. 1♂, 4♀ USNM, 1♂, 1♀ BMB; *Retalhuleu*: San Sebastián 1♂ USNM; *Not located*: Central Valleys 2♀ BMNH; no specific locality 1♀ BMNH. **EL SALVADOR** (2♀): *San Salvador*: Santa Tecla 900m May 1♀ AME; *Santa Ana*: Citalá 800m Oct. 1♀ AME. **NICARAGUA** (1♂): *Jinotega*: Jinotega 3400' Nov. 1♂ BMNH. **COSTA RICA** (1♂, 2♀): *Cartago*: Turrialba 2000' Jul. 1♂ USNM; *San José*: Río Sucio 1♀ BMNH; *Not located*: no specific locality 1♀ ZMHU. **PANAMA** (6♂, 4♀): *Chiriquí*: Boquete 1♂ BMNH; Chiriquí 2♂ ZMHU; Potrerillos 3600' Jan.-Mar. 1♂, 4♀ USNM, 1♂ STRI; Volcán Barú 1300m Feb. Mar. 2♂ USNM. **COUNTRY UNKNOWN** (4♂, 2♀): no specific locality 2♂ BMNH, 1♀ USNM, 1♀ MNHN, 2♂ MCZ.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona; Sierra Madre; Soconusco (de la

Maza & de la Maza, 1993); *Jalisco*: La Calera Nov. (Vargas *et al*., 1996).

Adelpha paroeca pseudodonysa Salazar, 2000 **stat. nov.**

Figs. **36e,f**; *281*

Adelpha pseudodonysa Salazar (2000: 89, figs. 6,7)

TL: Río Ábita, San José del Palmar, Chocó, Colombia. **Types**: **MHNUC**: **HT**♂: Río Ábita [photograph examined]; **PT**♂: Río Ábita [not examined]

Identification, taxonomy and variation:

This subspecies differs from the nominate on the dorsal surface by the much thinner white postdiscal bands and expanded orange postdiscal series. On the forewing, the latter produces a much broader orange spot in cell Cu$_1$-M$_3$, a large, orange postdiscal spot in cell Cu$_2$-Cu$_1$, and traces of orange dashes on the hindwing between veins Cu$_2$ and M$_1$. On the ventral surface, the ground colour is blackish brown, lacking reddish brown shading, and the pale subapical marking is tinged with dark orange distally, in addition to the differences in the shape of the postdiscal series seen on the dorsal surface.

Salazar (2000) described this taxon based on two male specimens from Río Ábita, in west Colombia, and figured the dorsal and ventral surfaces in black and white. The taxon was compared with and distinguished from *A. seriphia* on the basis of its darker brown ventral ground colour and more strongly marked VHW submarginal series. However, no mention was made of the ventral submarginal series being undivided, a character occurring in *A. zea*, *A. paroeca*, *A. nea* and *A. paraena*. The configuration of the black lines in the basal half of the VHW, and the separate upper postdiscal band and postdiscal series on the VFW, demonstrate that *pseudodonysa* is distinct from *A. zea* and *A. nea*, respectively. The majority of the wing pattern differences that distinguish *pseudodonysa* from *A. paroeca* are produced by expansion or contraction of the postdiscal band and series, both of which show much geographic variation within related species (e.g., *A. seriphia*, *A. serpa*). In comparison with specimens of *A. p. paroeca* from western parts of the range, the type has more extensive orange-brown colouring basal of the VHW white postdiscal band and reduced silvery grey ventral submarginal series. However, both of these characters are also observed in geographically intermediate populations of *A. p. paroeca* from Panama (Fig. 36c,d), and vary in other closely related species (e.g., *A. nea*). Finally, the ground colour is also a character that shows much interspecific variation within *Adelpha*. The shape of the postdiscal band and outer postdiscal series on the VHW, which curve basally then distally at vein Rs, the basally displaced orange postdiscal block in cell Cu$_1$-M$_3$ on the VFW, closely bordering the white postdiscal band, and the lack of a postcellular marking in M$_2$-M$_1$ on the VFW, are all characters typical of *A. paroeca*; since there are no characters that distinguish *pseudodonysa* from *paroeca* that do not vary in closely related species, and the taxa are closely allopatric, I regard them as conspecific (**stat. nov.**).

Range: The only known locality for this taxon is that of the holotype, on the central western slopes of the Colombian Cordillera Occidental. The taxon probably occurs throughout the Pacific slopes of this mountain range at least as far south as extreme northwestern Ecuador, and may also range east into the Cauca, and possibly Magdalena, valleys of Colombia.

Habitat and adult ecology: This remarkable, recently discovered taxon is evidently extremely rare, being known to date only from the two type specimens collected at the same time and place. The type locality lies at 800m in transitional lowland to lower montane wet forest, but the taxon is presumably confined to montane forest habitats.

Specimens examined: 1 (1♂)

COLOMBIA (1♂): *Chocó*: San José del Palmar, Río Ábita 1♂ MHNUC (photograph examined).

Fig. 36e,f. *Adelpha paroeca pseudodonysa*, W. Colombia: **e**: dorsal surface; **f**: ventral surface.

Adelpha nea (Hewitson, 1847)

Figs. **37**; 128; 212; *281*

Identification, taxonomy and variation:

Adelpha nea is distinguished from all other members of the *A. serpa* group by having the pale postdiscal marking in cell Cu$_2$-Cu$_1$ of the VFW approximately half again as wide as the marking in cell 2A-Cu$_2$, due to the fusion of the postdiscal band with the inner, and possibly outer, postdiscal series in this cell. Another useful distinguishing character is the lack of any whitish postdiscal streaks in cells M$_2$-M$_1$ and M$_1$-R$_5$ between the VFW discal cell and the pale subapical marking, also lacking in *A. zea.* The shape of the male genitalic valva is unique within the *A. serpa* group, being elongated and curved at the distal tip (Fig. 128). *Adelpha nea* may be easily distinguished from species outside the *A. serpa* group by the curved, dark third discal cell bar on the VFW. *Adelpha nea nea* is also the only taxon in the *A. serpa* group in which the DFW postdiscal band is entirely orange in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$. The colour of the DFW postdiscal band varies geographically and two subspecies are recognised.

Range and status: Mexico to Venezuela, to southern Peru, Amazonian Brazil and the Guianas. Almost certainly more widespread, extending to northwestern Ecuador and Bolivia. Very rare, in lowland rain forest from sea level to 750m.

Specimens examined: 40 (16♂, 24♀)

Adelpha nea nea (Hewitson, 1847)

Figs. **37a,b**; 128a; 212a-c; *281*

Heterochroa nea Hewitson (1847: 257, pl. XX, fig. 1)

TL: Pará [Brazil]. **Types**: **BMNH**(T): **ST**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//165//Heterochroa nea Hewitson ♀ Lectotype det. R.I. Vane-Wright 1983 - see Hall, 1938: 285//nea Hew.//B.M. TYPE No. Rh. 9844 Heterochroa nea ♀ Hew.//Pará//Type//Lectotype" [examined]

=*Adelpha nea campeda* Fruhstorfer (1915: 532)

TL: Colombia. **Types**: **BMNH**(T): **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//nea campeda Fruhst.//Columbien ex Coll. H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**?♀: "Colombie Collection Le Moult//Fruhstorfer Coll. B.M. 1937-285" [both examined]

Adelpha nea Hew., Kirby (1871)

Identification, taxonomy and variation:

Adelpha nea nea is distinguished from *A. nea sentia* by the DFW postdiscal band being entirely orange in at least cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$. It is very similar to, and frequently confused in collections with, *A. melona leucocoma*, but is most easily distinguished by the curving dark third cell bar in the VFW discal cell that divides the pale area between the second and fourth discal cell bars into three. There is a little local variation in the amount of white on the postdiscal band at the anal margin of the DFW, which tends to be more extensive in Colombian specimens but also occurs in the syntype specimen of *A. nea*. The single Costa Rican specimen has the orange DFW subapical marking barely joined to the remainder of the postdiscal band.

Hewitson (1847) accurately figured and described *A. nea* based on material in the British Museum from Pará, and made special note of the differences in the configuration of VFW discal cell bars that readily distinguish this species from *A. melona*. A syntype female is in the BMNH and was figured by Neild (1996). Fruhstorfer (1915) described an unspecified number of Colombian female specimens as a new subspecies, *campeda*, and a syntype female is in the BMNH. Hall (1938) synonymised *campeda* with *nea*, with which I concur, all Fruhstorfer's supposed differences between the taxa being minor individual variation, if apparent at all.

Range: Costa Rica to Venezuela, to southern Peru, Amazonian Brazil and the Guianas. Although as yet unrecorded, it probably also occurs in the Chocó region of western Colombia to northwestern Ecuador.

Habitat and adult ecology: *Adelpha nea nea* is widespread but appears to be very rare throughout its range. Females outnumber males in collections by almost 2:1. There is almost nothing known of its biology, Neild (1996) never encountered the species in the field in Venezuela, while DeVries (1987) was also unaware of its presence in the Costa Rican fauna. In eastern Ecuador, Jason Hall (pers. comm.) captured a male specimen in a ridge top subcanopy trap baited with rotting fish in primary lowland rainforest in the middle of the wet season, but despite numerous other visits to the same locality we have never again encountered the species. The species is probably both seasonal and usually confined to the canopy.

Specimens examined (13♂, 23♀):

COSTA RICA (1♀): Costa Rica Coll. Frank Johnson 1♀ AMNH. **PANAMA** (2♀): *Panamá*: Cocolí Dec. 1♀ STRI; Colón 1500' Feb. 1♀ USNM. **VENEZUELA** (1♂, 1♀): *Barinas*: Reserva Forestal Ticoporo 230m Apr. 1♂ MUSM; *Delta Amacuro*: Río Acure 1♀ AME. **COLOMBIA** (3♂, 3♀): *Cundinamarca*: Bogotá 2♂ BMNH; *Vaupés*: Mitu Aug. 1♂ ESM; *Not located*: no specific locality 2♀ BMNH, 1♀ BMB. **ECUADOR** (1♂): *Napo*: Chichicorrumi 450m Jul. 1♂ KWJH. **PERU** (2♂, 3♀): *Junín*: La Merced 2500' 1♂, 1♀ BMNH; *Loreto*: Iquitos 1♀ AMNH; *Puno*: Chaquimayo 25-3000' Aug.-Oct. 1♂ BMB; Río Távara 450m Aug. 1♀ MUSM. **BRAZIL** (2♂, 7♀): *Amazonas*: Massaury 1♀ ZMHU; *Pará*: Óbidos Jan. 1♀ AME, 1♂ AMNH; Pará 1♂, 3♀ BMNH; *Not located*: no specific locality 2♀ BMB. **GUYANA** (1♂, 2♀): *Potaro/Siparuni*: Potaro River Jul. 1♀ AME; *Not located*: Essequibo R. 140 mi. inland 1♂ BMNH; no specific locality 1♀ BMNH. **FRENCH GUIANA** (3♂, 4♀): *Cayenne*: Cayenne 1♂ BMNH, 1♀ ZMHU; *Laurent du Maroni*: Nouveau Chantier 1♂ BMNH; St. Laurent du Maroni 1♀ BMNH, 1♀ BMB; Maroni 1♂ BMNH; *Not located*: no specific locality 1♀ MNHN.

Additional locality data: **ECUADOR** (1♂/♀): *Napo*: Rocafuerte (coll. M. Moreno, Quito). **BRAZIL**: *Amazonas*: Ilha de Maracá (Mielke & Casagrande, [1992]; possibly misidentification of *A. melona leucocoma*, not recorded from this site).

Adelpha nea sentia Godman & Salvin 1884 **stat. nov.**

Figs. **37c,d**; 128b; *281*

Adelpha sentia Godman & Salvin (1884: 309, Tab. XXIX, figs. 9,10)

TL: Corosal, British Honduras [Belize]. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9848 Adelpha sentia ♂ G. & S.//Corosal British Honduras Roe// B.C.A. Lep. Rhop. Adelpha sentia G. & S. Godman-Salvin Coll. 1916.-4.//♂//Type H.T." [examined]

Adelpha serpa sentia G. & S., Fruhstorfer (1915); =*Adelpha serpa celerio* Bates, Hall (1938); *Heterochroa serpa sentia* G. & S., Hoffmann (1940) (actually *A. paraena massilia*); *Limenitis* (*Adelpha*) *sentia* G. & S., Ross (1976) (actually *A. paraena massilia*); *Adelpha serpa sentia* G. & S., Austin *et al*. (1996) (actually *A. paraena massilia*)

Identification, taxonomy and variation:

This subspecies is easily distinguished from the nominate by the DFW postdiscal band being almost entirely white. It is very similar to *A. paraena massilia*, but distinguished by having orange scaling at the distal edge of the white DFW postdiscal spots in cell Cu_1-M_3 and M_3-M_2, the spot in cell Cu_1-M_3 being wider than that in cell Cu_2-Cu_1, and by lacking any whitish dashes in cells M_2-M_1 and M_1-R_5 between the end of the discal cell and the pale subapical marking on the VFW (resulting from the fusion of the subapical marking with the upper postdiscal band). *Adelpha seriphia godmani* and *A. serpa celerio* may be distinguished by the same characters, as well as by having paired instead of single white submarginal markings in each cell space on the ventral surface. *Adelpha paroeca* may be additionally distinguished by having an orange postdiscal spot in cell Cu_1-M_3 on the DFW. The amount of orange scaling at the distal edge of the white postdiscal markings in cells Cu_2-Cu_1 and Cu_1-M_3 is slightly variable in *A. nea sentia*.

Adelpha nea sentia was figured and described as a full species by Godman & Salvin (1884) from a single male specimen which is now in the BMNH (Fig. 37c,d). However, all subsequent authors have regarded this taxon as synonymous with *A. paraena massilia* (see discussion under that taxon). The broad postdiscal marking in cell Cu_2-Cu_1 compared with that in cell 2A-Cu_2 is a character unique among members of the *A. serpa* group to *A. nea*, and the fusion of the subapical marking with the upper postdiscal band on the VFW is a character found within the *A. serpa* group only in *A. nea* and *A. zea*. In addition, the distinctive shape of the male genitalic valva (Fig. 128b) confirms beyond doubt that this is the sister taxon to nominate *A. nea*.

Range: Mexico, in the state of Oaxaca, to Belize, almost certainly occurring in Guatemala and probably extending to Nicaragua. Austin *et al*. (1996) list "*A. serpa sentia*" from Guatemala, but I presume that this is the more common *A. paraena massilia*.

Habitat and adult ecology: Nothing is known of the natural history of this subspecies. It is very rare in collections and its range is no doubt much wider than current specimen data indicate. All records are from lowland forest. The dorsal wing pattern differences between this subspecies and the nominate may well be the result of mimicry between this taxon and a large number of superficially similar sympatric *Adelpha*, including *A. paraena massilia*, *A. serpa celerio*, *A. iphiclus* and *A. iphicleola*.

Specimens examined (3♂, 1♀):

MEXICO (1♂, 1♀): *Oaxaca*: Chimalapa Sep. 1♂ AME; *Quintana Roo*: X-Can Jul. 1♀ AME. **BELIZE** (1♂): *Atlántida*: Corozal 1♂ BMNH. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ MNHN.

Adelpha paraena (H. W. Bates, 1865)

Figs. 6h,9; **38**; 129; 213; *282*

Identification, taxonomy and variation:

Adelpha paraena is similar to several other members of the *A. serpa* group. It is distinguished from *A. serpa*, *A. radiata*, *A. seriphia* and *A. hyas* by the VFW submarginal series being composed of single, instead of paired, whitish dashes in each cell space, most notable in cells Cu_2-Cu_1 and M_3-M_2. It is distinguished from *A. nea* by having whitish postdiscal streaks on the VFW between the discocellulars and the subapical marking in cells M_3-R_5 and at the costa. *Adelpha paroeca* is also similar, but always has well developed orange and white postdiscal spots in cell Cu_1-M_3 on the DFW, in addition to a much broader inner submarginal series on the VHW. There is variation on the DFW in the size and extent of the orange subapical marking and the white postdiscal spot in cell Cu_1-M_3, in addition to the width of the white postdiscal bands, and four subspecies are recognised, one of which is described here.

The undivided spots of the VFW submarginal series suggest *A. paraena* is probably most closely related to *A. nea* and *A. paroeca*, and this is borne out by cladistic analysis (Willmott, 1999, in prep.), although it has often been considered a subspecies of *A. serpa*.

Range and status: Mexico to Bolivia, Brazil and the Guianas. Uncommon to rare throughout the range, in lowland rain forest from sea level to 1100m.

Specimens examined: 174 (106♂, 68♀)

Adelpha paraena paraena (H. W. Bates, 1865)

Figs. 6h,9; **38a,b**; 129; *282*

Heterochroa paraena Bates (1865: 331)

TL: Pará [Brazil]. **Types**: **BMNH**(T): **ST**♀: “Heterochroa paraena Bates ♀ Syntype det. R.I. Vane-Wright 1983//Illustrated in The Butterflies of Venezuela A. Neild, 1996//172//B.M. TYPE No. Rh. 9847 Heterochroa paraena ♀ Bates//Adelpha paraena Bates Godman-Salvin Coll. 1916.-4.//♀ Pará paraena//♀//Pará L. Amazons H. W. Bates//Type H.T.//Syntype”; **BMNH**(M): **ST**♂: “Pará//parana [sic-red label]//Adelpha paraena Bates Godman-Salvin Coll. 1916.-4.//Pará L. Amazons H. W. Bates//♂” [both examined]

Adelpha serpa var. *paraena* Bates, Kirby (1871); *Adelpha serpa paraena* Btlr. [sic], Fruhstorfer (1915); *Adelpha paraena* Bates, Hall (1938); *Limenitis serpa paraena* Fruhst., Brown & Mielke (1967); *Adelpha paraena paraena* Bates, Neild (1996).

Identification, taxonomy and variation:

Adelpha paraena paraena is distinguished from *A. paraena massilia* and *A. paraena reyi* by having an orange postdiscal marking instead of a white postdiscal marking on the DFW in cell Cu_1-M_3. *Adelpha paraena lecromi* lacks any postdiscal marking in this cell, or may have a small white dot. The subspecies is very similar to *A. radiata explicator* and *A. radiata radiata*, but is distinguished by having the submarginal series on the VFW composed of single, instead of double, white spots in each cell space, especially noticeable in cell M_3-M_2. *Adelpha serpa* and *A. seriphia* may be distinguished in a similar manner, and always have a fully developed white postdiscal marking in cell Cu_1-M_3 on the DFW. The veins crossing the orange DFW subapical marking in females of *A. paraena paraena* tend to be orange rather than dark brown, while Guianan females occasionally have faint, sparse orange postdiscal scaling in cell Cu_2-Cu_1 on the DFW.

Adelpha paraena was described by Bates (1865) based on the female, and I have examined a syntype female, which was figured by Neild (1996), and possible syntype male (Bates appears to have occasionally misidentified the sexes of type specimens of other new *Adelpha* taxa that he described). The description is accurate and discusses the diagnostic character for this species, the single submarginal spots on the VFW, although it appears that all subsequent authors, with the exception of Neild (1996), failed to take note of this important character. Fruhstorfer (1915) placed the taxon as a subspecies of *A. serpa*, while Hall (1938) correctly reinstated it as a distinct species based on the rearing experiments of Miles Moss in Pará.

I have examined several specimens from Meta Province in Colombia that exhibit variation on the DFW, suggesting intergradation with *A. paraena reyi*, which occurs in Venezuela near the Colombian border at the base of the eastern Mérida slopes. The female specimen from Río Ariari has a small white spot at the base of cell Cu_1-M_3, while both females from Remolinos lack orange postdiscal markings in cell Cu_1-M_3, the latter (as listed below) also has a small white spot at the base of cell Cu_1-M_3. The former Remolinos specimen closely resembles *A. paraena lecromi* described below, but has the narrow white DFW postdiscal band and broad orange DFW subapical marking typical of the nominate subspecies.

Two specimens of *A. paraena paraena* from southeastern Brazil in the USNM and the AME differ from typical *A. paraena paraena* in having broader white dorsal postdiscal bands. However, I have also seen a specimen in the AMNH labelled “Paraná” [S.E. Brazil], which appears to be typical, although it is possibly mislabelled. More material may demonstrate southeast Brazilian specimens to be distinct and to merit subspecific status, but I treat them for the present as *A. paraena paraena*.

Range: East of the Andes from Venezuela to Bolivia, Brazil and the Guianas. Specimens from southeastern Brazil may represent a distinct subspecies.

Immature stages: There is some confusion regarding the identification of this species and *A. serpa diadochus* in the paper of Moss (1933), who reared both species in Pará, Brazil. While his specimens were identified by Hall (1933), whose discussion of Moss’ species clearly indicated that he was aware of the distinguishing characters of both *A. serpa* and *A. paraena*, Moss’ collection in the BMNH has a series of *A. paraena paraena* identified as *A. serpa*, and a series of *A. serpa diadochus* identified as *A. paraena*. It is therefore unclear whether Moss’ (1933) published information for each of these species is under the correct name or not, and I have been unable to solve this through examination of the preserved early stage material, which is in uncharacteristically poor condition. For the present, I regard the names in the drawer of Moss’ collection as applying to the same taxa as in his paper (Moss, 1933), and the following information, and the hostplant records in Appendix C, were reported by him under the name *A. serpa*. Moss figured both the last instar larva (pl. I, figs. 15, 16) and the pupa (pl. II, fig. 8). The last instar is dark green, with an area behind the head and the posterior end orange-brown, the head capsule (Fig. 9) is striped with black and there are well developed scoli on segments T2, T3, A2, A7 and A8. The A2 scolus is dark green, composed of densely overlapping spines and curved posteriorly (Fig. 6h), the remaining scoli are orange-brown. Supraspiracular scoli are short with terminal spines. When at rest in a curved position (shown in Moss’ figure) the larva strongly resembles a bird dropping. The pupa has a shining metallic colour, the dorsal projections are relatively small and the head horns are long, thin and curved laterally. The larvae are found on bushes or the lower branches of the hostplant.

Habitat and adult ecology: The nominate subspecies is widespread, but with the exception of the Guianas and lower

Amazon, it is rare throughout its range. In eastern Ecuador it occurs as solitary individuals in both disturbed primary and secondary rain forest habitats up to 850m, and is most frequently encountered in the wet season. Males may be attracted to rotting fish in subcanopy traps in light gaps, most often in the early afternoon on hot days.

Specimens examined (59♂, 38♀): † - trans. to *A. p. reyi*, no orange in DFW cell Cu_1-M_3; ‡ - trans. to *A. p. reyi*, trace white spot in DFW cell Cu_1-M_3.

VENEZUELA (1♀): no specific locality 1♀ BMNH. **COLOMBIA** (1♂, 3♀): *Meta*: Río Ariari Aug. 1♀‡ LMC; San José Guaviare Aug. 1♀ JFL; Remolinos (Meta) X/89, *leg.* J. Burgos 1♂† JFL; Remolinos Meta 25/3/87, *leg.* J.F. LeCrom 1♀†‡ JFL. **ECUADOR** (4♂): *Morona-Santiago*: Bomboiza 850m Jul. 1♂ KWJH; Santiago 350m Sep. 1♂ KWJH; *Napo*: Chichicorrumi 450m Jul. 1♂ KWJH; Finca San Carlo 600m Sep. 1♂ KWJH. **PERU** (20♂, 3♀): *Huánuco*: Tingo María May 1♂ AME; *Junín*: La Merced 2500' Apr. Aug. 4♂, 3♀ BMNH, 1♂ BMB; Río Satipo 750-850m Aug. 1♂ MUSM, 1♂ AMNH; *Loreto*: Borja 1000' 1♂ BMB; Iquitos Aug. 1♂ BMNH; Pebas 2♂ ZMHU, 1♂ BMNH; San Roque 1♂ AME; Explornapo Camp, nr. Iquitos Mar. 1♂ AME; *Madre de Dios*: Boca Río La Torre 300m Sep. 4♂ MUSM; *Not located*: Huallaga 1♂ AMNH. **BOLIVIA** (1♂): *Santa Cruz*: Santa Cruz 1♂ BMNH. **BRAZIL** (14♂, 17♀): *Amazonas*: Humayta Jul.-Sep. 1♂ BMNH; Massaury 1♂, 1♀ ZMHU; Manaus 1♂ ZMHU; São Paulo de Olivença 1♂ ZMHU; *Minas Gerais*: Leitão, km 142 Curvelo May 1♂ USNM; *Pará*: Óbidos 1♀ BMNH; Pará 7♂, 13♀ BMNH, 1♀ AMNH, 1♂ BMB; Santarém Nov. 1♂ AME; *Paraná*: "Paraná, Brazil//coll. Frank Johnson" 1♀ AMNH-error?. **GUYANA** (1♂, 4♀): *East Berbice/Courantyne*: New River 750' Jan.-Mar. 1♀ BMNH; *Upper Takutu/Upper Essequibo*: Kuyuwini R. 1♂ AMNH; *Not located*: no specific locality 2♀ BMNH, 1♀ BMB. **FRENCH GUIANA** (15♂, 6♀): *Cayenne*: Cayenne 1♂ ZMHU, 1♀ BMNH; Guatimala 1♂ MNHN; *Laurent du Maroni*: Maroni River 1♂ AME; St. Laurent du Maroni 1♀ MNHN; *Not located*: no specific locality 12♂, 4♀ BMNH. **SURINAM** (1♂, 1♀): *Brokopondo*: Geldersland, Surinam River 1♀ USNM; *Not located*: no specific locality 1♂ BMNH. **COUNTRY UNKNOWN** (1♂, 2♀): Onoribo Mar. 1♀ BMNH; no specific locality 1♂ ZMHU, 1♀ BMB.

ssp. nov.?

BRAZIL(1♂, 1♀): *Distrito Federal*: "Brazil: Parque do Gama, 950m, D.F. Brazil, 14 May 1969, S.S. Nicolay" 1♂ USNM; *Minas Gerais*: Paracatú, km 231 Belo Horizonte-Brasília Apr. 1♀ AME.

Additional locality data: **ECUADOR**: *Napo*: Cerro Lumbaquí Norte 950m Aug. (Willmott & Hall, sight records). **BRAZIL**: *Distrito Federal*: Parque do Gama 1100m Jun.; *Goiás*: Leopoldo Bulhões 1000m Dec.; *Minas Gerais*: km 485 BR-040 600m Feb. (Brown & Mielke, 1967).

Adelpha paraena lecromi Willmott, **ssp. nov.**

Figs. **38c,d**; *282*

Adelpha nr. *paraena* Bates, Aiello (1984); *Adelpha serpa* ssp. nov., Lamas & Small (1992)

Description and diagnosis: FW length of HT: 28mm. Both sexes differ from *A. paraena massilia* and *A. paraena reyi* in lacking or only having a faint trace of a white spot at the base of DFW cell Cu_1-M_3. In *A. p. massilia* and *A. p. reyi*, this white spot is always well developed and fills the basal area of this cell as far as the distal edge of the white postdiscal spot in cell Cu_2-Cu_1. *Adelpha p. reyi* also has a narrower orange subapical marking and the upper postdiscal band usually consists of more pronounced whitish dashes. The nominate subspecies differs as follows on the DFW: the white postdiscal band is narrower, particularly the marking in cell Cu_1-M_3, with the basal edge incised with black at vein Cu_1, and the marking in cell Cu_1-M_3 is therefore almost isolated from that in cell Cu_2-Cu_1; the upper postdiscal band is never visible as faint whitish dashes; the orange subapical marking is broader and extends fully into cell Cu_1-M_3. On the VFW of *A. p. lecromi* the pale subapical marking is more isolated from the upper postdiscal band by dark brown, while on the VHW the submarginal series are often cleaner white and more sharply defined.

Types: ***Holotype*** ♂: COLOMBIA: *Cundinamarca*: "Adelpha sentia Bogotá"; in the USNM.

Etymology: This subspecies is named for Jean François LeCrom, for his generous hospitality during my visit to Colombia and whose collection supplied important information on the distribution of *A. paraena* subspecies.

Taxonomy and variation: In the Canal zone in central Panama, specimens of *A. paraena* exist with every variation in the size of the white postdiscal spot on the DFW in cell Cu_1-M_3, indicating intergradation between *A. p. lecromi* and *A. p. massilia*. A specimen similar to *A. p. lecromi* from Remolinos in Colombia appears to be an intergrade between the nominate subspecies and *A. p. reyi* (see under nominate subspecies). I have refrained from designating type specimens from among the Panamanian material I have examined since it all originates in the Canal area, an apparent hybrid zone. The holotype was probably collected in the valleys to the northwest of Bogotá.

Lamas & Small (1992) refer to this subspecies as *A. serpa* ssp. nov., while Aiello (1984) referred to it as *A.* nr. *paraena*.

Range: This subspecies has been recorded only from two areas, central Panama and the general labelling locality of "Bogotá" in Colombia, the latter specimen probably being collected in the Magdalena valley west of the Cordillera Oriental. As yet, it is unrecorded from western Colombia or western Ecuador, but it is expected to occur there.

Immature stages: Aiello (1984) reared this subspecies (under the name nr. *paraena*) on *Combretum decandrum* (Combretaceae) in Panama. She figured the larva and pupa (figs. 4, 6, nr. PAR), and described the larva as being very similar to *A. serpa celerio*, but paler above, mottled brown and black, with a white dorsal patch joining A6 and A7. The scoli are brown, with the scolus on A2 the darkest, and the latter is long, straight and slender, with ascending spines, similar to *A. serpa celerio*; the subspiracular scoli on segments A2-4 are pink. The ventral half of segments A1-T1 is dark, and there are dark, oblique stripes on segments A2-A7. The larva turned yellowish just prior to pupation. The pupal head horns are shorter than in *A. serpa celerio*, curving outwards at their midpoint.

Habitat and adult ecology: Presumably similar to other subspecies.

Specimens examined (12♂, 3♀): † - slight hint whitish scaling in base DFW cell Cu_1-M_3.

PANAMA (11♂, 3♀): *Panamá*: Aiello Lot 82-55 no.1, 1♂†, Lot 82-55 no.2, 1♂, Lot 97-15 no.2, 1♂, Lot 93-89 no.2, 1♀ STRI; Farfán Jun. Jul. 4♂, 1♀ USNM, 1♂ STRI; Fort Kobbe Jun. Nov. 3♂ USNM; Paraíso Jan. 1♀ AME. **COLOMBIA** (1♂): *Cundinamarca*: Bogotá 1♂ USNM.

Adelpha paraena reyi Neild, 1996

Figs. **38e,f**; *282*

Adelpha paraena reyi Neild (1996: 43, pl. 4, fig. 174)

TL: Las Quiguas, Esteban Valley, N. Venezuela. **Types** (all Venezuela): **BMNH**(M): **HT**♂: Las Quiguas; **PT**♂: Macuto; **PT**♀: Caracas; **AFEN**: 1**PT**♂, 2**PT**♀: Hda. Pánaga [all examined]; **AFEN**: 1**PT**♂, 1**PT**♀: Hda. Pánaga; **TP**: **PT**♀: Tucuco; **DLF**: **PT**♀: Via Altamira de Caceres; **MALUZ**: 2**PT**♂: El Tucuco; **JB**: **PT**♀: Isla de Betancourt; **RM**: **PT**♂: Río Chucurí; **R**: **PT**♂: R. S. Domingo; **PT**♀: Maracay [not examined]

Identification, taxonomy and variation:

This subspecies is most similar to *A. p. massilia*, from which it is distinguished by the narrower DFW orange subapical marking and by typically having slightly broader white postdiscal bands. It is also very similar to *A. radiata romeroi*, which is distinguished by having the ventral submarginal series divided in each cell space. There is some variation in the width of the postdiscal bands and the orange DFW subapical marking, the former being broadest and the latter narrowest along the Cordillera de la Costa. The upper postdiscal band is often present on the DFW as whitish rays, and sometimes in females as solid white streaks (see Neild (1996) for illustrations of a wide range of phenotypes).

This subspecies was clearly described and figured by Neild (1996) and the holotype is in the BMNH (Fig. 38e,f).

Range: North and northwestern Venezuela: west of the Cordillera de Mérida to the Sierra de Perijá, on the eastern slopes of the Cordillera de Mérida and along the northern slopes of the Cordillera de la Costa. Although unrecorded to date from Colombia, it should occur there both in Norte de Santander and extreme northern Meta.

Habitat and adult ecology: Neild (1996) reports that he never encountered this subspecies in the field, but like other subspecies of *A. paraena* it appears to be much rarer than the sympatric subspecies of *A. serpa*. *Adelpha p. reyi* is sympatric along the Cordillera de la Costa with *A. erotia caphira* (form "lerna"), *A. naxia*, *A. malea ixia*, and *A. barnesia trinita*, all of which are unrelated species which have forms strikingly similar to *A. paraena reyi*, and these five taxa are almost certainly involved in mimicry.

Specimens examined (3♂, 4♀):
VENEZUELA (3♂, 4♀): *Barinas*: Río Caparo Research Station, 32 km E. El Canton, b-light, Feb 1♀ USNM; *Carabobo*: Las Quiguas, Esteban Vall., N. Ven. Nov.-Mar. 1♂ BMNH; *Distrito Federal*: Caracas 1♀ BMNH; Macuto 0m Mar. 1♂ BMNH; *Táchira*: Hda. Pánaga 800m Mar. Oct. Nov. 1♂, 2♀ AFEN.
Additional locality data: **VENEZUELA**: See type data above (Neild, 1996).

Adelpha paraena massilia (C. & R. Felder, 1867)

Figs. **38g,h**; 213a,b; *282*

Heterochroa massilia C. & R. Felder (1867: 423)

TL: Mexico. **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//Mexico Sallé Type//H. massilia Felder//massilia n." [examined]

Adelpha serpa var. *massilia* Fldr., Kirby (1871); *Adelpha serpa sentia* G. & S., Fruhstorfer (1915), *auctt.*, misid.; =*Adelpha serpa celerio* Bates, Hall (1938); *Limenitis (Adelpha) sentia* G. & S., Ross (1976) misid.; *Adelpha serpa massilia* Fldr., Lamas & Small (1992); *Adelpha paraena massilia* Fldr., Neild (1996)

Identification, taxonomy and variation:

Adelpha paraena massilia is distinguished from the nominate subspecies and *A. p. lecromi* by having a well developed white postdiscal spot in cell Cu_1-M_3 on the DFW. *Adelpha p. reyi* has the orange DFW subapical patch much reduced in width and broader white postdiscal bands. *Adelpha p. massilia* is similar to sympatric *A. serpa* and *A. seriphia*, but may be distinguished by the submarginal series on the ventral surface being composed of single instead of double white spots in each cell space. *Adelpha nea sentia* is distinguished by having a trace of orange at the distal margin of the white postdiscal spot in cell Cu_1-M_3 on the DFW, in addition to several other characters (see under *A. nea sentia*). There is some local variation in the size of the spots of the VFW submarginal series, which are usually reduced or absent in cells Cu_1-M_3, M_2-M_1 and the apical area.

Felder & Felder (1867) described *massilia* from an unspecified number of male specimens collected by Sallé in Mexico in their own collection, and compared it with *A. serpa celerio*, stating that the two submarginal white bands on the VHW were composed of undivided spots, a character separating the taxon from both *A. serpa celerio* and *A. seriphia godmani*. I have examined a syntype in the BMNH. Soon after, Kirby (1871) placed *massilia* as a "variety" of *A. serpa*, and ever since there has been confusion as to its correct taxonomic status. Godman & Salvin (1884) figured a specimen of *A. seriphia godmani* as *Adelpha massilia*, misled by the original description's mention of narrower white postdiscal bands. Fruhstorfer (1915) placed the name as a subspecies of *A. iphiclus* and figured a specimen of *A. iphicleola iphicleola* as *massilia* (Fruhstorfer, 1913, pl. 107e), referring to true *massilia* as *A. serpa sentia* (Fruhstorfer, 1915), both misidentifications that were followed by most subsequent authors (e.g., Beutelspacher, 1976; de la Maza, 1987; DeVries, 1987; Austin, 1992; Austin *et al*., 1996). Neild (1996) was the first to correctly treat *massilia* as a subspecies of *A. paraena*. In central Panama specimens transitional to *A. paraena lecromi* occur, with a reduced white postdiscal spot in cell Cu_1-M_3 of the DFW, and a specimen was figured by Aiello (1984) as "nr. *paraena*".

Range: Mexico to central Panama, with intergrades to *A. p. lecromi* in the Canal zone.

Habitat and adult ecology: Little has been published on the adult ecology of this subspecies, except for a report by Austin *et al.* (1996, as *serpa sentia*) that it is uncommon in the Tikal area of Guatemala within and along the edges of primary forest, in the months of May and December. DeVries (1987) never saw the species in the field. In Chajul, Mexico, I found the subspecies in disturbed lowland rain forest. Judging from the number of specimens in collections it is uncommon throughout its range, being heavily outnumbered by the similar and common *A. serpa celerio*.

Specimens examined (32♂, 23♀): † - trans. to *A. p. lecromi*, with white spot in DFW cell Cu_1-M_3 half normal size.
MEXICO (12♂, 10♀): *Chiapas*: Chajul, Río Lacuntún Jul. 1♀ KWJH; Palenque Jan. 1♂ AMNH; *Oaxaca*: Chimalapa Oct. 1♂, 2♀ AME; *Tabasco*: La Venta 10m Jan. 2♂, 1♀ AME; *Veracruz*: Catemaco Jun. Oct. 2♀ AME; Coatzacoalcos Jan. 1♂ AME; Franja Vieja Aug. 1♀ AMNH; Minatitlán Jul. 1♂ AMNH; Moloacán Sep. 1♂ AMNH; Pajaritos Jul. 1♂ AMNH; Popoctepetl, Tuxtla 400m Jul. 1♀ MUSM; Tierra Blanca Aug. 1♂, 1♀ AME; Veracruz 1♂ USNM, 1♀ AMNH; *Not located*: Cotontepec Jun. 1♂ AME; no specific locality 1♂ BMNH. **GUATEMALA** (9♂, 3♀): *El Petén*: Sayaxché Aug. Sep. 6♂, 2♀ AMNH; *Escuintla*: Palín Oct. 1♂ USNM; *Retalhuleu*: San Sebastián 2♂, 1♀ USNM. **HONDURAS** (1♂, 2♀): *Colón*: Puerto Castilla Jul. 1♂ BMB; *Cortés*: San Pedro Sula 2♀ BMNH. **COSTA RICA** (1♂, 1♀): *Guanacaste*: Finca Taboga Jan. 1♂ FSCA; *Not located*: no specific locality 1♀ AMNH. **PANAMA** (9♂, 7♀): *Bocas del Toro*: Bocas del Toro Jan. 1♀† USNM; *Chiriquí*: Boquete Dec. 1♀ USNM; Bugaba 800-1500' 1♂ BMNH; Chiriquí 1♂ BMNH, 1♂ BMB; Lino 1♀ BMNH; *Colón*: Gamboa, Cerro Pelado Oct. 1♀† USNM; *Panamá*: Aiello Lot 93-76 no.2 1♀† STRI; El Llano 330m Cord. de San Blas Jul. 1♀† USNM; Farfán Feb. Jun. Jul. 2♂, 2♀(1♂, 1♀†) USNM, 2♀(1†) STRI; Fort Kobbe Jun. 1♂† USNM; Paraíso Jan. 1♂† AME; STRI Tupper Centre Jan. 1♀ STRI; *Veraguas*: Veraguas 2♂† BMNH.
Additional locality data (all reported as *serpa sentia*): **MEXICO**: *Veracruz*: 1.75 mi. E. Sontecomapan sea level Aug.; 2 mi. N.E. Catemaco 300m Sep. (Ross, 1976). **GUATEMALA**: *El Petén*: Tikal (Austin *et al*., 1996). **BELIZE**: *Corozal*: Fresh Water Creek Forest Preserve (Meerman, 1999).

Adelpha radiata Fruhstorfer, 1915

Figs. **39**; 130; 214; *282*

Identification, taxonomy and variation:

The majority of subspecies of *A. radiata* may be distinguished from *A. serpa*, *A. seriphia* and *A. hyas* by the great reduction or loss of the white postdiscal spot in cell Cu_1-M_3 on the DFW. *Adelpha radiata myrlea* closely resembles *A. serpa serpa*, but has the spots of the VHW submarginal series divided in each cell space. *Adelpha paraena* may be similarly distinguished from all *A. radiata* subspecies by having undivided spots comprising the ventral submarginal series. There is geographic variation in the shape and size of the orange DFW subapical marking and presence of a white spot in cell Cu_1-M_3 on the DFW, and six subspecies are recognised.

Adelpha radiata is most closely related to *A. serpa*, *A. seriphia* and *A. hyas*, with which it shares divided spots in the VFW submarginal series. There are no consistent genitalic differences between any of these species.

Range and status: Central Panama to northwestern Ecuador, eastern Ecuador, Venezuela, French Guiana and southeastern Brazil. Very rare, in lowland rain forest from near sea level to 900m, unrecorded throughout the majority of its presumed range, four of the six known subspecies described since 1995.

Specimens examined: 28 (14♂, 14♀)

Adelpha radiata radiata Fruhstorfer, 1915

Figs. **39a,b**; *282*

Adelpha serpa form *radiata* Fruhstorfer (1915: 531)

TL: Santa Catharina [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//serpa radiata Fruhst.//Brasilien Blumenau Fruhstorfer//TYPE//Type//Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//Brasilien Blumenau Fruhstorfer//TYPE//Type"; **BMNH**(M): **ST**♀: "Brasilien Blumenau Fruhstorfer//radiata Fruhst.//Fruhstorfer Coll. B.M. 1937-285"; **ST**♂ & ♀: "Brasilien Blumenau Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285" [all examined]

Adelpha radiata Fruhst., Hoffmann (1936); *=Adelpha serpa serpa* Boisd., Hall (1938); *Adelpha radiata radiata* Fruhst., Willmott & Hall (1999)

Identification, taxonomy and variation:

Adelpha radiata radiata differs from *A. radiata myrlea* in having only a small white dot, in addition to a large orange postdiscal marking, in cell Cu$_1$-M$_3$ on the DFW. It is distinguished from other subspecies by enlarged submarginal series on the VHW (and VFW), separated only by a thin, darker brown line. This subspecies is similar to *A. paraena paraena*, which has undivided spots in each cell forming the ventral submarginal series. *Adelpha hyas hyas* is smaller and has, on the VFW, deeper intruding dark lines into the pale subapical marking, a yellowish colour in the discal cell and no red between the fourth discal cell bar and the postcellular bar, and on the VHW the reddish postdiscal band is almost fused with the inner submarginal series. *Adelpha serpa serpa* always has a well developed white postdiscal spot in cell Cu$_1$-M$_3$ of the DFW, the VFW has dark orange postdiscal dashes in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ (probably representing the outer postdiscal series) which are absent in *A. radiata radiata*, and the white blocks composing the inner submarginal series on the VHW are not divided by dark lines. The size of the white dot in cell Cu$_1$-M$_3$ on the DFW is somewhat variable in the few specimens of *A. radiata radiata* that I have been able to examine.

Fruhstorfer (1915) described this taxon as a form of *Adelpha serpa*, which he stated was intermediate between typical *serpa* and *A. hyas hyas*, based on an unspecified number of specimens from Santa Catharina in southeastern Brazil. There are two males and three females in the BMNH from Fruhstorfer's collection labelled Blumenau, which appear to be syntypes (Fig. 39a,b). Hoffmann (1936) stated that he regarded *radiata* as representing a valid species, since despite having reared many individuals of *A. serpa serpa*, he never found any specimens similar to *radiata*. Hall (1938), however, placed the taxon as a synonym of nominate *A. serpa*, an unsurprising decision since he relegated taxa of no less than six distinct *A. serpa* group species to the status of forms or subspecies of *A. serpa*. In fact, *A. radiata radiata* is sympatric with *A. hyas hyas*, *A. serpa serpa* and probably *A. paraena paraena*, and distinguished by several characters from each (see above). The true systematic status of the taxon *radiata*, and indeed all *A. radiata* subspecies, has been greatly obscured by the rarity of all these taxa in collections and the consequent difficulty in establishing the sympatry of phenotypes and the reliability of characters for distinguishing species. The taxonomic arrangement adopted here is the result of fieldwork in eastern Ecuador, which demonstrated the broad sympatry of five species (Willmott & Hall, 1999), and the subsequent tracing of each of these species throughout the Neotropics. While there is no single character that defines *A. radiata* throughout its range, allopatric taxa in neighbouring regions are associated through a consilience of characters and are thus provisionally grouped as a single species. Such characters are discussed under each subspecies.

Range: Southeastern Brazil, from Rio de Janeiro to the state of Santa Catharina, possibly also extending to northern Argentina (Misiones), since Hayward (1973) reports specimens "intermediate" between *A. serpa serpa* and *A. hyas hyas* from there.

Habitat and adult ecology: Little has been reported on the behaviour or habitat of this rare subspecies. Thomas Emmel (pers. comm.) captured males hill topping on an open summit in Santa Catharina.

Specimens examined (8♂, 5♀): † - white spot in cell Cu$_1$-M$_3$ larger than typical.

BRAZIL (9♂, 5♀): *Rio de Janeiro*: Rio 1♂ BMNH; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 2♂ FSCA; Blumenau 2♂, 3♀ BMNH; Joinville 20-200m Feb. Dec. 2♂ MUSM; Rio Natal, São Bento do Sul 550m Feb. 1♂ MUSM; *São Paulo*: São Paulo 2500' Nov. Dec. 2♀† BMB. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Adelpha radiata myrlea Fruhstorfer, 1915

Figs. **39c,d**; *282*

Adelpha serpa form *myrlea* Fruhstorfer (1915: 532)

TL: Espírito Santo [Brazil]. **Types**: **BMNH**(T): **HT**♂: "Fruhstorfer Coll. B.M. 1937-285//serpa myrlea Fruhst.//Espírito Santo Brazil A. Heyne, Berlin-Wilm. V//TYPE//Type//Syntype" [examined]

=Adelpha serpa serpa Boisd., Hall (1938); *Adelpha radiata myrlea* Fruhst., Willmott & Hall (1999)

Identification, taxonomy and variation:

Adelpha radiata myrlea differs from the nominate subspecies in having a well developed postdiscal white spot in cell Cu$_1$-M$_3$ on the DFW, and no orange postdiscal spot in this cell. It is very similar on the dorsal surface to *A. serpa serpa*, but on the VFW lacks the dark orange postdiscal dashes in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$, and has the spots of the VHW submarginal series divided in each cell. *Adelpha hyas hyas* has a clearly different dorsal and ventral surface, the latter differing particularly in the deeply intruding dark lines in the pale VFW subapical area and the expanded VFW submarginal series, which extend to merge with the postdiscal series in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$; in *A. r. myrlea*, the postdiscal series are absent in these cells.

Fruhstorfer (1915) described *myrlea* from a single specimen in his collection on the basis of the reduced DFW orange subapical marking, and the holotype is in the BMNH (Fig. 39c,d). There is little variation in the three specimens examined. This taxon is placed as a subspecies of *A. radiata* on the basis of the divided submarginal series (also shared with *A. hyas hyas*) and the absence of the postdiscal series in cell Cu$_2$-Cu$_1$ on the VFW.

Range: Southeastern Brazil, from Espírito Santo to Rio de Janeiro, though possibly extending as far north as Bahia.

Habitat and adult ecology: This subspecies is very rare in collections and nothing has been reported on its habitats or behaviour.

Specimens examined (1♂, 2♀):

BRAZIL (1♂, 2♀): *Rio de Janeiro*: San Antonio dos Brotos 1♀ BMNH; *Espírito Santo*: no specific locality 1♂ BMNH; *Not located*: no specific locality 1♀ BMNH.

Adelpha radiata explicator Willmott & Hall, 1999

Figs. **39e,f**; 130; *282*

Adelpha radiata explicator Willmott & Hall (1999: 14, fig. 9a,b, 19)

TL: Finca San Carlo, km 13 Puyo-Tena rd., E. Ecuador. **Types**: **KWJH**: **HT**♂: Finca San Carlo [examined]

Identification, taxonomy and variation:

Adelpha r. explicator is distinguished from other *A. radiata* subspecies in their respective accounts. It is very similar to *A. paraena paraena*, but may be distinguished by the spots of the ventral submarginal series being divided in each cell space.

Adelpha r. explicator is sympatric with *A. paraena paraena*, *A. serpa diadochus* and *A. hyas hewitsoni*, while *A. seriphia aquillia* also occurs in eastern Ecuador but at higher altitudes. It shares with nominate *A. radiata* the reduction of the DFW white postdiscal spot in cell Cu$_1$-M$_3$ and the lack of any dark orange postdiscal markings (representing the outer postdiscal series) on the VFW in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$, and with *A. r. gilletella* and *A. r. aiellae*, the reduced VHW submarginal series.

Range: To date only known from a single site in eastern Ecuador, but presumably occurring at least throughout the upper Amazon basin.

Habitat and adult ecology: This subspecies is extremely rare, currently known only from a single specimen from eastern Ecuador, which was captured in a large light gap created by a tree fall along a ridge top in primary forest. This individual was flying about the clearing in bright sun in the middle of the morning, with periods of alternating rapid wing beats and gliding. It perched in between flights on bushes 1-5 m above the ground around the edge of the arena, in the company of *A. paraena paraena*. The great similarity between the dorsal surfaces of these two taxa, and other sympatric *A. radiata* and *A. paraena*, suggests there may well be a mimetic relationship. The recent discoveries of *A. r. explicator*, *A. r. gilletella*, *A. r. aiellae* and *A. r. romeroi* suggest that *A. radiata* is a very widespread species, and since all known male specimens outside of southeastern Brazil have been captured on hill tops, further collecting in this microhabitat will hopefully extend the known ranges of *A. radiata* subspecies and possibly reveal further undescribed taxa.

Specimens examined (1♂):
ECUADOR (1♂): *Napo*: Finca San Carlo 600m Sep. 1♂ KWJH.

Adelpha radiata aiellae Willmott & Hall, 1999

Figs. **39g,h**; 214; *282*

Adelpha radiata aiellae Willmott & Hall (1999: 16, fig. 10a,b, 20)

TL: nr. Lita, Río Baboso, ridge to east, W. Ecuador. **Types**: **KWJH**: **HT**♂: nr. Lita, Río Baboso, ridge to east; **AT**♀: km 40 Lita-San Lorenzo rd., Río Durango, W. Ecuador; **USNM**: **PT**♀: Gatún, Panama; **STRI**: **PT**♀: Gatún, Panama; **FSCA**: 2**PT**♀: Piña, Panama; **LMC**: **PT**♀: Yatacué, Colombia [all examined]

Identification, taxonomy and variation:

Adelpha r. aiellae is superficially most similar on the dorsal surface to *A. r. explicator*, from which it differs in having a smaller orange spot in cell Cu$_1$-M$_3$ of the DFW, the orange DFW subapical marking broader in cells M$_3$-R$_5$ with the veins crossing it less heavily lined with black, and a narrower white postdiscal band on the DHW. On the VFW, *A. r. aiellae* has dark orange dashes in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$, representing the outer postdiscal series, which are absent in *A. r. explicator*. In fact, *A. r. aiellae* is probably more closely related to *A. r. gilletella*, which shares all of the previously mentioned diagnostic characters, and differs from *A. r. aiellae* only in the presence of an orange spot on the DFW in cell Cu$_2$-Cu$_1$ and in having a narrower white DFW postdiscal band. However, it is almost certainly isolated from *A. r. gilletella* by the recently discovered *A. r. romeroi*, which probably flies throughout northwestern Venezuela. There is some variation in the size of the orange spot in cell Cu$_1$-M$_3$ on the dorsal forewing, which may be larger than that in the figured specimen, and Panamanian specimens have the veins crossing the orange subapical marking on the dorsal forewing slightly less strongly lined with dark brown than the two known Ecuadorian specimens (Fig. 39g,h). A tiny white dot is sometimes present at the base of cell Cu$_1$-M$_3$ on the DFW.

This taxon is sympatric with *A. serpa duiliae* and *A. seriphia godmani*, and associated with *A. radiata* on the basis of its similarity to *A. r. gilletella*.

Range: Central Panama to northwestern Ecuador, west of the Andes, but possibly more widespread in Central America, perhaps extending into Costa Rica.

Immature stages: Constantino (1998) listed the hostplant and described the early stages of this *Adelpha* taxon under "*A. serpa*", but an examination of the voucher specimen in the LMC shows it to be *A. radiata*. The last instar is dark brown with black markings and green spots, resembling lichen, and the head is dark brown with black marks. The colour and form of the scoli were unfortunately not specified. The pupa has long head horns and is chrome coloured, with the sutures lined in black, becoming bright golden just before eclosion. Aiello (1984) reports rearing a species in the *A. serpa* group (her Group I) with a larva resembling *A. serpa celerio* but a pupa resembling *A. paraena*. Unfortunately the pupa died, but this species might well also have been *A. radiata aiellae*.

Habitat and adult ecology: This subspecies is very rare in collections and to date has been recorded from near sea level to 900m in the vicinity of disturbed primary rain forest habitats. The only known male specimen in collections was found perching on top of a 4m high bush at the edge of a very wide path along the top of a steep-sided forested ridge. I have also observed a single, probably male individual, resting on a fallen tree trunk across a path in a forest light gap, perhaps feeding at sweat. The single female I have seen was flying 5m above a wide river through secondary growth in the early afternoon. In western Ecuador the species has only been encountered towards the end of the wet season.

Specimens examined (1♂, 6♀):
PANAMA (4♀): *Colón*: Gatún 350' Jan. May 1♀ USNM, 1♀ STRI; Piña 200m Feb. Jul. 2♀ FSCA. **COLOMBIA** (1♀): *Valle del Cauca*: Yatacué, Alto Anchicayá 600m Sep. 1♀ LMC. **ECUADOR** (1♂, 1♀): *Carchi*: Lita, ridge east of Río Baboso 900m Jul. 1♂ KWJH; *Esmeraldas*: Río Durango 250m Jul. 1♀ KWJH.
Additional locality data: **ECUADOR**: *Esmeraldas*: La Chiquita 50m May (Willmott & Hall, sight records).

Adelpha radiata romeroi Willmott & Neild, **ssp. nov.**

Figs. **31a,b**; *282*

Description and diagnosis: FW length of HT: 32 mm. This subspecies is distinguished from all neighbouring *A. radiata* subspecies (*A. r. explicator*, *A. r. gilletella*, *A. r. aiellae*) by the reduced orange DFW subapical marking, which does not extend posteriorly beyond vein M$_3$. The orange subapical marking is also approximately two-thirds the width of that in neighbouring subspecies, and the veins crossing the marking are more heavily lined with dark brown. *Adelpha radiata myrlea* (southeastern Brazil) also has the orange DFW subapical spot absent in cell Cu$_1$-M$_3$, like this new subspecies, but has a fully developed white DFW postdiscal spot in cell Cu$_1$-M$_3$ and the submarginal series of whitish dashes on the VHW are almost fused with each other. *Adelpha paraena reyi* is very similar to this taxon, but may be distinguished by having the white dashes composing the ventral submarginal series undivided in each cell space.

Types: ***Holotype*** **&**: VENEZUELA: *Táchira*: Río Frío, 600m, March 1992 (C. F. Romero); in the R (Romero family collection, Maracay).

Etymology: This subspecies is named for Francisco "Paquito" Romero, who collected the holotype specimen, as a gesture of the immense gratitude of the second author for Paquito's generous help and hospitality during his research on Venezuelan butterflies.

Taxonomy and variation: Willmott & Hall (1999) presented a checklist of names applicable to *A. radiata*, but since they were unaware of the existence of this taxon they did not mention it. The holotype female, recently noticed by the second author during a visit to Venezuela, remains the only known specimen of the taxon, and we are therefore unable to assess phenotypic variation. Nevertheless, given the minimal wing pattern variation in the Transandean *A. radiata aiellae*, from western Ecuador to central Panama, the wing pattern differences evident in this phenotype suggest that it represents a distinct population. Furthermore, the wing pattern is very similar to other sympatric *Adelpha*, especially *A. paraena reyi*, strongly suggesting that such taxa are involved in mimicry and therefore probably have closely congruent ranges. The holotype has the upper postdiscal band on the DFW very faintly showing as paler scaling; since a number of other northwest Venezuelan *Adelpha* with similar dorsal wing patterns have forms where the DFW upper postdiscal band is clearly visible as white scaling (e.g., *A. paraena reyi*, *A. naxia*, *A. malea ixia*, *A. erotia caphira* [form "lerna"], *A. barnesia leucas*), particularly from the Cordillera de la Costa, it is very probable that some specimens of this new taxon will also have similar markings.

Fig. 31a,b. *Adelpha radiata romeroi*, **ssp. nov.**, holotype: **a**: dorsal surface; **b**: ventral surface.

Range: This subspecies is known only from the type locality, which lies at the base of the eastern slopes of the Sierra de El Tamá (a northern extension of the Colombian Cordillera Oriental), in western Venezuela. However, given the close wing pattern similarity with *A. paraena reyi* and other similar *Adelpha*, it almost certainly occurs further north and west, throughout the eastern foothills of the Cordillera de Mérida, the Catatumbo basin between the Cordilleras de Mérida and Perijá, and in the western part, at least, of the Cordillera de la Costa.

Habitat and adult ecology: This subspecies is known from 600m, but presumably occurs in a similar elevational range in similar habitats to other *A. radiata* subspecies. As with other subspecies of *A. radiata*, it is clearly very rare.

Specimens examined (1♀):
VENEZUELA (1♀): *Táchira*: Río Frío [ca. 20 km S. of San Cristóbal] 600m Mar. 1♀ R.

Adelpha radiata gilletella Brévignon, 1995

Figs. **39i,j**; *282*

Adelpha gilletella Brévignon (1995: 17, fig. 27, 28, 29, 30)
TL: Galion, Roura, French Guiana. **Types** (all French Guiana): **LCB**: **HT**♂: Galion; **AT**♀: pk 35 RN2, Roura [original photographs examined]; **PT**♂: Galion Jan.; **PT**♂: pk 21 piste de Kaw, Roura Jul.; **JYG**: **PT**♂ & ♀: pk 21 piste de Kaw, Roura *in copulo* Oct. [not examined]
Adelpha radiata gilletella Brév., Willmott & Hall (1999)

Identification, taxonomy and variation:

This subspecies differs from all other subspecies in having a well developed orange postdiscal spot in cell Cu_2-Cu_1 on the DFW, and from *A. radiata radiata* and *A. r. myrlea* by the much narrower ventral submarginal series. *Adelpha r. explicator* has a narrower orange block in cell Cu_1-M_3, a narrower orange subapical marking with the veins that cross it strongly lined with black, and the white postdiscal band is broader, especially the spot in cell Cu_2-Cu_1. On the VFW of *A. r. explicator* the pale subapical marking and postdiscal spot in cell Cu_1-M_3 are of uniform colour and do not have the distal edge dark orange. *Adelpha r. aiellae* has a broader white DFW postdiscal band, particularly in cell Cu_1-M_3. Brévignon & Brévignon (1997) figure a specimen of *A. r. gilletella* that has a large, round postdiscal orange marking in cell 2A-Cu_2 distal of the white band, and thick orange postdiscal dashes on the DHW along the outer postdiscal series in cells Cu_1-M_3, M_3-M_2 and M_2-M_1.

Brévignon (1995) clearly illustrated dorsal and ventral surfaces of the male and female of this taxon, which he described as a species on the basis of its sympatry with *Adelpha serpa* and *Adelpha paraena*. He was, however, unaware of the existence of the taxon *radiata*, with which this subspecies shares the reduction of the white postdiscal spot in cell Cu_1-M_3 on the DFW, only occurring in related species in the sympatric *A. paraena paraena*. *Adelpha r. gilletella* and *A. r. radiata* are also of similar size and wing shape, and the orange DFW subapical marking is of similar shape and lacks the dark intruding lines typical of *A. hyas* on the ventral surface.

Range: This subspecies is currently known only from northern French Guiana, but it is undoubtedly more widespread, probably extending throughout the Guianas to northern Brazil (Amapá), and perhaps to the lower Amazon.

Habitat and adult ecology: Brévignon (1995) reports that the subspecies was encountered in forested hill top clearings at the end of the morning, and data indicate that it probably occurs throughout the year. Clearly it is very rare and I have seen no specimens in any of the collections that I have examined.

Specimens examined (1♂, 1♀):
FRENCH GUIANA (1♂, 1♀): *Cayenne*: Galion Roura Dec. 1♂ LCB(photograph); pk 35 RN2 Roura Nov. 1♀ LCB(photograph).
Additional locality data: See type data above (Brévignon, 1995).

Adelpha serpa (Boisduval, 1836)

Figs. 10; **40**; 117; 131; 215; *283*

Identification, taxonomy and variation:

Adelpha serpa is very similar to *A. seriphia*, but is consistently distinguished (from sympatric subspecies) by having the blocks comprising the DFW postdiscal band arranged more vertically, the DFW orange subapical marking more horizontal, and (from all subspecies except *A. seriphia barcanti*) by having the spots of the inner submarginal series approximately parallel to the orange postdiscal band on the VHW, rather than having those in cells M_1-Rs and Rs-Sc+R_1 much closer than the remainder. *Adelpha hyas* is smaller, has dark brown lines intruding into the pale subapical marking on the VFW, and lacks orange postdiscal dashes on the VFW in cells Cu_2-Cu_1 and Cu_1-M_3. Most subspecies of *A. radiata* lack a well developed white spot in cell Cu_1-M_3 on the DFW, and when this spot is developed, the spots comprising the VHW submarginal series are poorly defined and coalesce. All other similar *A. serpa* group species may be distinguished by having single instead of divided spots in each cell space comprising the submarginal series on the VFW. There is geographic variation in the width and colour of the postdiscal bands, the size of the orange DFW subapical marking and the width of the ventral submarginal series, and four subspecies are recognised.

Adelpha serpa forms a clade with three closely related species, *A. radiata*, *A. hyas* and *A. seriphia* (Willmott, in prep.).

Range and status: Mexico to western Ecuador, Venezuela to Bolivia, Brazil, Guianas and Paraguay. In disturbed forest areas, common west of the Andes in lowland and lower montane forest from sea level to 1700m, rarer east of the Andes in lowland forest up to 1000m.

Specimens examined: 698 (360♂, 338♀)

Adelpha serpa serpa (Boisduval, 1836)

Figs. 2a; **40a,b**; 131; 215a-c; *283*

Heterochroa serpa Boisduval (1836: pl. 8, fig 4)

TL: Brazil. **Types**: **BMNH**(M): **ST**♂: "LECTOTYPE ♂ Heterochroa serpa Boisduval 1836 G. Lamas det. 1997//Serpa B.d. iphicla God.Cr. 188 Bras.//Heterochroa Serpa, Bdv. (species gel. pl. 8 fig. 4//Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3" [examined]

=*Adelpha damon* Fruhstorfer (1913: pl. 107c; 1915: 531)

TL: [Paraguay; Santa Catharina (Brazil)]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//serpa damon Fruhst.//Brasilien Blumenau Fruhstorfer//TYPE//Type"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//Brasilien St. Cath. Fruhstorfer//TYPE//Type"; **BMNH**(R): **ST**♀: "serpa damon Fruhst.//Holotype//Type//Sapucay Paraguay 16.8.04 (W. Foster)//107 C4" [all examined]

=*Adelpha serpa* form *ornamenta* Fruhstorfer (1915: 531)

TL: "presumably Bahia" [Brazil]. **Types**: **MHNG**: **HT**♂: data not recorded [photograph examined]

Adelpha serpa Boisd., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. serpa diadochus* by the DFW white postdiscal band being narrower and composed of more disjointed spots, by the pale subapical marking on the VFW being almost connected to the white dashes of the upper postdiscal band by pale shading (in *A. s. diadochus* the two are separated by a brown line), by the more angular hindwing which has a straighter distal margin, by the straighter orange postdiscal band on the VHW, by the enlarged ventral submarginal series which are separated only by a thin dark brown line and by not having the spots of the VHW submarginal series divided in each cell. Other subspecies are easily distinguished by the reduced VHW submarginal series, the spots of which are more distinctly paired in each cell. *Adelpha serpa serpa* is similar to *A. radiata myrlea*, which differs by having the VHW submarginal spots divided in each cell. There is some variation in the width of the white postdiscal bands and the extent of the DFW subapical orange marking, which usually enters cell Cu_1-M_3 and may extend as far as vein Cu_1. In the case of the latter, the DHW may have orange dashes in each cell, marking the outer postdiscal series. Specimens with extensive DFW orange occur from Rio de Janeiro to São Paulo, but since typical specimens also occur throughout the same range, I regard the variation as infrasubspecific.

Boisduval (1836) appears to have provided no text to accompany his original figure of *Adelpha serpa*, which was named on the plate where the butterfly was figured in a natural pose with the wings closed, showing only the ventral surface. From the figure there is, however, no question as to the identity of the taxon, the broad VHW submarginal series being clearly evident. On page three of the "Explications des Planches" Boisduval gives the type locality of Brazil. Recently, Gerardo Lamas (pers. comm.) discovered a specimen among duplicate accession material from Oberthür's collection at the BMNH that appears to be a syntype. This specimen has slight orange spotting in the middle of cells M_3-Sc+R_1 along the inner postdiscal series on the DHW, and the DFW subapical orange marking extends to the middle of cell Cu_2-Cu_1, matching female specimens in the BMNH from Rio de Janeiro. Fruhstorfer (1913) figured his new taxon *damon* based on a female specimen from Paraguay, which he later placed as a subspecies of *A. serpa* (Fruhstorfer, 1915), stating that it differed from typical specimens of *A. serpa* in having a reduced orange DFW subapical marking and a narrower white postdiscal band. The figured female is in the BMNH(R), as are further syntypes from Blumenau (Fig. 40a,b); both differences represent no more than individual variation and Hall (1938) correctly synonymised *damon* with *serpa*. Fruhstorfer (1915) described a specimen of the form with orange dorsal postdiscal markings as *ornamenta*, based on a single specimen in the Geneva Museum, and this name was also synonymised with *A. serpa* by Hall (1938). Dr. Löbl, of the MHNG, kindly supplied me with a photograph of the presumed holotype of *ornamenta*, which closely resembles the syntype of *serpa*.

The nominate subspecies of *A. serpa* is actually rather different in several respects from remaining *A. serpa* subspecies, which have traditionally been treated as a distinct species, *A. celerio* (Fruhstorfer, 1915; Neild, 1996). In particular, it shares with *A. seriphia* the disjointed white postdiscal spots on the DFW, a more vertical orange DFW subapical marking, and the tendency to have dorsal orange dashes along the outer postdiscal series. However, the Bolivian *A. seriphia therasia*, geographically the closest subspecies, does not closely resemble *A. serpa*, while in the Amazonian *A. serpa diadochus* the VHW submarginal spots are enlarged and occasionally become entire, as in nominate *A. serpa*. Furthermore, Paraguayan specimens of *A. serpa*, particularly the female syntype of *damon*, are intermediate in wing pattern between *A. s. diadochus* and *A. s. serpa*. These specimens have the hindwing distal margin and orange postdiscal band on the VHW straighter than typical *A. s. diadochus*, but the black separating the submarginal series is heavier than in typical *A. s. serpa*, as in *A. s. diadochus*. There is reduced white scaling in the VFW apex, as in typical *A. s. diadochus*, and the pale VFW subapical marking is more isolated from the upper postdiscal band.

Range: Southeastern Brazil to Paraguay and northeastern Argentina.

Immature stages: Both Müller (1886) and Hoffmann (1936, 1937b) reported rearing "*Adelpha serpa*" in Santa

Catharina (Brazil), but while Müller's record is similar to many others for this species, in that it could also apply to *A. radiata* or *A. hyas*, Hoffmann clearly was aware of how to distinguish the three species and his hostplant and early stage records are therefore reliable. Both reported that the eggs are typical of the genus and are laid on the upperside of a leaf at the tip. Early instars are greenish with a matt, rust-red head capsule with paler marks, and the body is marked with light green spots, each with a fine grey seta (Hoffmann). The fifth instar was described in some detail by Hoffmann (1937b), who stated that the dorsal surface was a leaf-green colour. Segment T2 has four (subdorsal and supra-spiracular) well-developed, anteriorly directed, pinkish scoli, T3 has similar subdorsal scoli, and A1 has four green "tubercles" (presumably small scoli). Segment A2 has two subdorsal scoli, blue-green in colour, branched, bent almost to a right-angle and posteriorly directed. (Müller figured this scolus, on Taf 2, fig. 7, which is short, broad and has the lateral spines enlarged, flattened and merged.) Segments A1, 3 and A6 also have small, green scoli, while A7 and A8 each have two anteriorly directed, pinkish-orange scoli. Abdominal segments A2-A9 have a lateral, pinkish spot, which is reddish on A5. The head capsule (Müller, 1886: Taf. 2, fig. 21) has pronounced spines around the edge, and two black, vertical stripes at the outside edges of the labrum, in addition to vertical stripes at the lateral edges of the face. The final instar turns yellow prior to pupation, which occurs beneath a leaf. The pupa is a brilliant golden colour with small dorsal projections in the same position as the last instar scoli on segments T2, T3, A2, A3, A4, with those on A2 and A3 the most pronounced (Müller, 1886). The dorsal T2 projection is moderate, and the head has two diverging horns. The pupa apparently turns black just before the adults eclose (Hoffmann, 1937b).

The development times given by Hoffmann (1937a,b) are as follows: egg, 4 days; pupa, 12 days in February, 16-26 days in April to May, possibly due to the cooler temperature.

The larva extends the leaf midrib and rests on it in early instars (Hoffmann, 1937a).

Habitat and adult ecology: Ebert (1969) found this subspecies to be uncommon up to 1400m in Minas Gerais in low canopy forest. Brown (1992) reports that this subspecies occurs in humid forest in the Serra do Japi, São Paulo, up to 1000m. Judging from the number of specimens in collections it may be common in the field. Hoffmann (1936) found the larva at Santa Catharina in May.

Specimens examined (100♂, 78♀): † - orange on DFW in cell Cu_2-Cu_1; ‡ - trans. to *A. s. diadochus*.

"**MEXICO**" (1♂): no specific locality 1♂ MCZ-error. "**GUATEMALA**" (1♀): no specific locality 1♀ BMNH-error. "**HONDURAS**" (1♂): *Cortés*: San Pedro Sula 1♂ BMNH-error. "**PERU**" (1♀): *Junín*: Chanchamayo 1♀ ZMHU-error. **BRAZIL** (86♂, 68♀): *Espírito Santo*: no specific locality 2♂ BMNH; *Minas Gerais*: Leopoldina 1♂ ZMHU; Marumba R. Feb. 1♀ BMNH; Nova Lima Apr. Aug. 1♂, 1♀ AME; Rio das Velhas, Sabará-Belo Horiz. 1♀ BMNH; Serra do Espinhaço, km 344 Rio-Belo Horizonte Apr. 1♂ AME; no specific locality 1♂ BMNH; *Paraná*: Castro 1♂, 2♀ USNM, 1♂, 1♀ BMNH; Caviúna Jul. 2♂, 1♀ AMNH; Fernández Pinheiro 2-2600' Apr. 1♀ BMNH, 1♂ AME; N. Paraná 5♂, 8♀ AMNH; Ponta Grossa 900m Mar. 1♂ USNM; *Rio de Janeiro*: Corcovado 2♂, 1♀ MCZ; Organ Mts. 1♀ BMNH; Petrópolis 1500m May 1♀ BMNH, 1♂, 3♀ AME, 1♂, 1♀ USNM; Rio, May 6♂, 14♀ BMNH, 2♂ ZMHU; Rio Janeiro Jul. Nov. 2♀ USNM, 5♀† MNHN, 3♂ MCZ, 1♂, 1♀ USNM, 1♀ AMNH; Rio de Janeiro N.P. Dec. 1♂ BMNH; Rio Tijuca 1♀† MNHN; Tijuca 1♂, 1♀ USNM, 4♂, 2♀ BMNH; *Santa Catharina*: Rio Natal, nr. Rio Vermelho 900-1450' Mar. 1♂ FSCA; Blumenau 1♂, 2♀ BMNH, 1♂, 1♀ ZMHU, 3♂ MCZ, 1♀ AMNH; Campo Nola 1♂ AME; Corupá May 1♂ USNM, 1♂ AMNH; Joinville 10m Feb. Mar. 1♀ FSCA, 2♂ AME; Rio Natal, São Bento do Sul 550m Feb. 1♂ MUSM; Rio Vermelho 1♂, 1♀ AMNH; São Bento do Sul 1750' Mar. 1♂ FSCA; no specific locality 2♂, 3♀ AMNH, 1♂, 1♀ BMNH, 1♂, 1♀ ZMHU, 1♂ BMB, 1♂ MCZ; *São Paulo*: Alto da Serra 500' Nov. Dec. 1♂ BMB; Mendes 2♂, 1♀ AME; Santos Aug. 1♂† MNHN; São Paulo 1♂ BMNH, 5♂(3†), 2♀ BMB; *Not located*: S. Brazil 1♀ USNM, 1♂ BMNH; no specific locality Oct. Nov. 1♀ ZMHU, 2♂ BMNH, 2♂ BMB, 1♂, 2♀ MNHN, 1♂ MCZ. **PARAGUAY** (1♂, 2♀): *Paraguarí*: Sapucay Dec. 2♀‡ BMNH; *Not located*: S. Paraguay 1♂‡ BMNH. "**FRENCH GUIANA**" (2♂): *Cayenne*: Cayenne 1♂ MNHN-error; *Not located*: no specific locality 1♂† MNHN-error. **COUNTRY UNKNOWN** (9♂, 6♀): Henrietta ? 1♀ ZMHU; no specific locality 1♂ USNM, 5♂, 2♀ BMNH, 1♂, 1♀ MNHN, 2♂, 2♀ MCZ.

Additional locality data: **BRAZIL**: *Minas Gerais*: nr. Poços de Caldas 1300-1400m Feb. Mar. May Dec. (Ebert, 1969); Passa Quatro; *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *Santa Catharina*: Jaraguá Apr. Dec. (Hoffmann, 1936); *São Paulo*: Mata de Santa Genebra, nr. Campinas (Ecoforça, 2000); Serra do Japi 1000m (Brown, 1992). **ARGENTINA**: *Misiones* (Hayward, 1951).

Adelpha serpa diadochus Fruhstorfer, 1915

Figs. **40c,d**; *283*

Adelpha celerio diadochus Fruhstorfer (1915: 531)

TL: Tarapoto, Huallaga, Peru. **Types**: **BMNH**(T): **ST**?♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//183//Fruhstorfer Coll. B.M. 1937-285//celerio diadochus Fruhst.//Marcapata Peru//Peru H. Fruhstorfer//TYPE//Type//Syntype?" [examined]

=*Adelpha serpa* form *timehri* Hall (1938: 285)

TL: Guyana and Pará [Brazil]. **Types**: **BMNH**(M): **ST**♂: "Illustrated in the Butterflies of Venezuela A. Neild, 1996//185//Syntype ♂ Adelpha serpa f. timehri Hall G. Lamas det. 1987//B.C.A. Lep. Rhop. Adelpha celerio Bates Godman-Salvin Coll. 1916.-4.//♂//Cariamang River B. Guiana H. Whitely//Syntype"; **BMB**: **ST**♂: Pará Jan.-Mar. [both examined]

=*Adelpha celerio florea* Brévignon (1995: 17, fig. 31, 32)

TL: pk 27 Piste de Kaw, Roura, French Guiana. **Types** (all French Guiana): **LCB**: **HT**♂: pk 27 Piste de Kaw [original photograph examined]; **PT**♂: Montsinéry, Mar.; **PT**♂: Cacao, Roura, Apr.; **PT**♂: Maripasoula, Jul.; **JYG**: **AT**♀: Saül, Nov.; **Coll. B. Hermier, French Guiana**: **PT**♂: Montagne des Chevauz, Roura, Nov.; **PT**♂: Petits Saut, Sinnamary, Jan. [not examined]

Papilio iphicla [sic] Linn., Cramer (1777: 139, pl. 188, fig. E, F) misid.; *Papilio iphiclus* Linn., Herbst (1793: 138, n. 79, tab. 148, fig. 3, 4) misid.; *Adelpha iphicla* Linn., Hübner ([1819]: 42) misid.; *Papilio iphicla* [sic] Linn. var.?, Godart ([1824]) misid.; =*Heterochroa serpa* Boisd., Hewitson (1850); =*Adelpha serpa celerio* Bates, Hall (1938); *Adelpha serpa diadochus* Fruhst., Willmott & Hall (1999)

Identification, taxonomy and variation:

Adelpha serpa diadochus is distinguished from *A. s. celerio* and *A. s. duiliae* by the almost pure white dorsal postdiscal band which tapers anteriorly on the DFW, typically leaving a relatively small spot in cell Cu_1-M_3, by the thicker inner submarginal series on the VHW which has undivided spots in each cell near the costa, and by the smoothly curving orange VHW postdiscal band. Further characters are discussed under *A. s. celerio* and *A. s. serpa*. It is also similar to *A. radiata myrlea* (with which it is not sympatric) and *A. hyas viracocha*, but has the spots of the VHW submarginal series sharply defined. *Adelpha hyas hewitsoni* differs by having dark lines intruding into the pale subapical marking on the VFW and by lacking dark orange postdiscal dashes in cells Cu_1-M_3 and M_3-M_2 on the VFW. *Adelpha seriphia* may be distinguished in the same way as *A. serpa celerio* from *A. seriphia godmani*. The DFW orange subapical marking is slightly variable in size, and particularly in Guianan specimens may extend into cell Cu_1-M_3. The width of the DFW postdiscal band is also slightly variable, being narrowest in specimens from the base of the Andes.

This subspecies was figured for the first time by Cramer (1777) on plate 188, figs. E and F, based on a specimen from Surinam, but misidentified as *Papilio iphicla* Linnaeus. Hewitson (1850) and Westwood (1850) both stated that Cramer's figure represented *A. s. serpa*, a view followed by some subsequent workers (Butler, [1870]; Kirby; 1871), but not all, Bates (1865) and Godman & Salvin (1884) regarding it as representing Amazonian *A. s. celerio*. Fruhstorfer (1915), introducing the name *diadochus*, avoided the controversy by failing to mention Cramer's figure at all, and provided the briefest description of an unspecified number of specimens from Tarapoto. He stated merely that the size of the DFW orange subapical marking corresponded with that of *A. seriphia godmani*, while the postdiscal bands were similar to those of *A. s. celerio*. I have seen no specimens of *A. s. diadochus*, or indeed any *A. serpa*-group species, in any collections from Tarapoto, and the whereabouts of the specimen(s) on which Fruhstorfer based his description is unknown. The specimen listed above as a possible syntype came from Fruhstorfer's collection and is labelled "*celerio diadochus* Fruhst." in Fruhstorfer's hand, and it might possibly have lost an original Tarapoto label during later relabelling; the type of *A. thoasa zalma* was also supposedly from Tarapoto, but the only known syntype simply has the locality data "Peru". Nevertheless, the possible syntype of *diadochus* and the type locality leave little doubt in my mind as to the identity of the taxon. Hall (1938) synonymised *diadochus* with *A. s. celerio*, but went on to describe Guianan and Pará specimens as a form of *A. serpa*, *timehri*, of which I have examined two syntypes. The syntype specimen in the BMNH, from Guyana, has the orange subapical marking of the DFW extending into cell Cu_1-M_3, a character typically, but not always, present in Guianan specimens, and usually not apparent elsewhere in the range of *A. s. diadochus*. On the basis of this character Neild (1996) retained *timehri* as distinct from *A. s. diadochus*, and placed *timehri* as a subspecies of *A. celerio*. However, the second syntype of *timehri*, in the BMB, has only a hint of orange scaling on the DFW in cell Cu_1-M_3, and since this character seems to be variable in the Guianas and lower Amazon, and orange is present in cell Cu_1-M_3 on the DFW in a specimen from Ega in the BMNH, I do not regard it as sufficiently constant to retain *timehri* as a separate subspecies. Brévignon (1995), apparently ignorant of both of the names *timehri* and *diadochus*, described specimens of *A. s. diadochus* from French Guiana as a new subspecies, *A. celerio florea*. The holotype lacks orange in cell Cu_1-M_3 on the DFW, while this character is apparently present in three paratypes and the allotype (Brévignon, 1995). Neild (1996) synonymised *florea* with *timehri*, while Willmott & Hall (1999) placed *diadochus* as a subspecies of *A. serpa* with both *florea* and *timehri* as synonyms, the taxonomy adopted here.

Range: Eastern Colombia to Bolivia, Amazonian Brazil and the Guianas.

Immature stages: Moss (1933) reared this species in Brazil (Pará), but there is some confusion over his identification of the species and *A. paraena paraena* (see discussion under Immature stages of *A. paraena paraena*). The following information, and the hostplant records in Appendix C, were reported by him under the name *A. paraena*. The egg is laid singly at the tip of the leaf and the brown first instar hatches approximately one week later. The last instar is bright green and differs from the sympatric *A. paraena paraena* in not having orange-brown scoli. Also, the lateral figure of the larva (pl. I, fig. 17) shows the scolus on A2 to be long, slender and straight, as described by Aiello (1984) for *A. serpa celerio*. The head capsule is similar to that of *A. paraena* (Fig. 9).

The larvae typically occur on low saplings less than a metre above the ground and as early instars expose and extend the midrib in the manner typical of the genus, resting on the upper surface of the leaf in the final instar. Early instars apparently suffer heavy predation by Hymenoptera.

Habitat and adult ecology: *Adelpha serpa diadochus* is very local and uncommon, and is particularly poorly represented in collections from the central Amazon. It is restricted to lowland rain forest up to 1000m. Males may be attracted to rotting fish in subcanopy traps in old, selectively logged forest light gaps. In eastern Ecuador, I have observed males perching with the wings open or closed in the early to middle afternoon on bushes 3-5m high, in large (20m wide), old clearings surrounded by primary or secondary forest along rivers, patrolling the entire clearing with a gliding flight, with few wing beats. Such microhabitats are also frequented by *A. thoasa manilia*, *A. hyas hewitsoni* and *A. iphicleola thessalita*, and these species are probably involved in mimicry. Andrew Neild (pers. comm.) captured a female flying with a male at Bomboiza in eastern Ecuador, in an area of secondary growth. Brévignon (1995) reports that the species is active in French Guiana from late morning to early afternoon, and frequents both hilly and flat areas.

Specimens examined (43♂, 28♀):
COLOMBIA (1♀): *Caquetá*: Río Orteguaza 1000' Jan. 1♀ USNM. **ECUADOR** (7♂, 3♀): *Morona-Santiago*: Bomboiza 850m Nov. 2♂, 1♀ KWJH; *Napo*: Misahuallí, 4 km W. 400m Oct. 1♂ GWB; Pimpilala 600m Aug. 1♂ KWJH; Río Shandia 550m Sep. 1♂ KWJH; *Pastaza*: Canelos Jan. 1♀ ZMHU; Puyo 1000m Dec. 1♂ USNM; Río Bobonaza 1000m Oct. 1♂ MJP; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m 1♀ PJD. **PERU** (11♂, 10♀): *Cuzco*: Marcapata 1♂ BMNH; *Huánuco*: Tingo María 800m Mar. Jun. 1♂ FSCA, 1♂ USNM, 1♀ AME; *Junín*: Chanchamayo 2♀ ZMHU, 1♀ USNM; Ipokiari May 1♀ MUSM; La Merced 2500' 1♂ BMB, 1♀ MUSM; *Loreto*: Castaña 150m Oct. 1♀ MUSM; Iquitos 2♀ AMNH; Pebas 120m Sep. 1♂ MUSM, 1♂ ZMHU; *Pasco*: Pozuzo 800' Apr. 1♂ BMB; *San Martín*: Jepelacio 2♂, 1♀ AMNH; *Not located*: E. Peru 1♂ BMB; upper Río Marañón Jan. 1♂ AMNH. **BOLIVIA** (2♂, 2♀): *La Paz*: Río Songo 1♂ ZMHU; *Santa Cruz*: Buenavista 750m Apr.-Aug. 1♀ BMNH; Prov. del Sara 1♂ BMNH; *Not located*: no specific locality 1♀ BMNH. **BRAZIL** (10♂, 6♀): *Amazonas*: Ega 1♂ BMNH; São Paulo de Olivença 1♂ ZMHU; Tonantins 1♀ BMNH; *Maranhão*: Mts. Aureos 1♀ BMNH; *Pará*: Pará Jan.-Mar. 1♂ BMB, 5♂, 4♀ BMNH, 1♂ MCZ; Villa Nova 1♂ BMNH. **GUYANA** (2♂): *Cuyuni/Mazaruni*: Cariamang River 1♂ BMNH; *Not located*: no specific locality 1♂ USNM. **FRENCH GUIANA** (11♂, 6♀): *Cayenne*: Cayenne 2♂ BMNH; pk 27 Piste de Kaw, Roura Aug. 1♂ LCB(photograph); *Laurent du Maroni*: Maroni 1♂ BMNH; Maroni River 1♂ AME; St. Jean du Maroni 2♂, 1♀ BMNH; *Not located*: no specific locality 3♂, 5♀ BMNH, 2♂ MNHN.

Additional locality data: **VENEZUELA**: *Pantepui*; *Ventuari*; *Imerí* (Neild, 1996). **FRENCH GUIANA**: See type data for *florea* (from Brévignon, 1995).

Adelpha serpa celerio (H. W. Bates, 1864)

Figs. 10; **40e,f**; 117; *283*

Heterochroa celerio Bates (1864: 127)

TL: Polochic Valley, Guatemala. **OTL**: Guatemala; Upper and Lower Amazons. **Types**: **BMNH**(T): **LT**♂: "Heterochroa celerio Bates ♂ Syntype det. R.I. Vane-Wright 1983//Illustrated in The Butterflies of Venezuela A. Neild, 1996//179//B.M. TYPE No. Rh. 9845 Heterochroa celerio ♂ Bates// B.C.A. Lep. Rhop. Adelpha celerio Bates Godman-Salvin Coll. 1916.-4.//♂//Polochic Valley F.D.G. & O.S.//Type H.T.//Syntype"; **PLT**♀: "Heterochroa celerio Bates ♀ Syntype det. R.I. Vane-Wright 1983//Illustrated in The Butterflies of Venezuela A. Neild, 1996//182//B.M. TYPE No. Rh. 9846 Heterochroa celerio ♀ Bates// B.C.A. Lep. Rhop. Adelpha celerio Bates Godman-Salvin Coll. 1916.-4.//♀//Polochic Valley F.D.G. & O.S.//Type H.T.//Heterochroa celerio n.s."; **BMNH**(M): **PLT**♂: "♂ Ega//celerio[red label]//B.C.A. Lep. Rhop. Adelpha celerio Bates Godman-Salvin Coll. 1916.-4.//♂//Ega U. Amazons H. W. Bates" = *serpa diadochus*; **PLT**♀: "Pará//celerio[red label]//B.C.A. Lep. Rhop. Adelpha celerio Bates Godman-Salvin Coll. 1916.-4.//♀//Pará L. Amazons H. W. Bates" = *serpa diadochus* [all examined]

=*Adelpha diademeta* Fruhstorfer (1913: pl. 107d; 1915: 530)

TL: [Western Mexico and Orizaba]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//celerio diademata Fruhst.//W. Mexico H. Fuhstorfer//TYPE//Type//Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//W. Mexico H. Fuhstorfer//TYPE//Type"; **BMNH**(R): **ST**♀: "serpa diademata Fruhst.//Orizaba//R" [all examined]

=*Adelpha phintias* Fruhstorfer (1913: pl. 107c; 1915: 530)

TL: [Mérida, Venezuela]. **Types**: **BMNH**(R): **ST**♀: "serpa phintias Fruhst.//Syntype//TYPE//Montan. Sierra Mérida 3000m 8.7.98 (Briceno)//181//Illustrated in The Butterflies of Venezuela A. Neild, 1996" [examined]

Adelpha serpa var. *celerio* Bates, Kirby (1871); *Adelpha cestus* Hew., Boisduval (1870) misid. ?; *Limenitis (Adelpha) paroeca* Bates, Ross (1976) misid.; *Adelpha celerio diademata* Fruhst., Fruhstorfer (1915), de la Maza & de la Maza (1993), Vargas *et al*. (1996), Warren *et al*. (1998); *Adelpha serpa celerio* Bates, Willmott & Hall (1999)

Identification, taxonomy and variation:

Adelpha serpa celerio differs from *A. serpa diadochus* in having broader postdiscal bands, which usually have a pale greenish tint and do not taper so much anteriorly, the outer postdiscal series on the VHW is roughly parallel to the postdiscal band and a darker reddish colour, and the spots of the submarginal series are reduced in size, the inner series being almost equal in width to the outer, and clearly divided in each cell. *Adelpha serpa duiliae* differs by having narrower, even more bluish green postdiscal bands, which have more disjointed spots on the DFW, and a smaller orange subapical marking on the DFW. *Adelpha seriphia godmani* is very similar but has the blocks of the white postdiscal band on the DFW displaced more diagonally, the orange DFW subapical marking is orientated vertically rather than horizontally, the orange postdiscal band on the VHW is straighter and the inner submarginal series is not roughly parallel to the postdiscal orange band on the VHW but is much closer in cells M_1-Rs and Rs-Sc+R_1 than throughout the remainder of the wing. *Adelpha paroeca*, *A. paraena massilia* and *A. nea sentia* all have the spots of the ventral submarginal series undivided in each cell. There is some individual variation in the width and colour of the pale postdiscal bands, which vary from almost white to a greenish blue. The DFW orange subapical marking also varies slightly in width.

Bates (1864) described *celerio* based on an unspecified number of male and female specimens from Guatemala, and stated that it also occurred on the upper and lower Amazon. Although he compared it to *A. serpa*, strangely he failed to mention the diagnostic undivided spots of the VHW submarginal series in that taxon. I have located four specimens in the BMNH that appear to be syntypes, and since two of these are from Brazil and represent a different taxon (*serpa diadochus*) to the Guatemalan specimens, I believe a lectotype designation is necessary. Since the taxon was based first and foremost on Guatemalan specimens (later stated by Bates (1865) to have been captured by Salvin), and the name has been applied ever since to the Central American subspecies, I designate the specimen in the BMNH(T) with the following label data as lectotype of *Heterochroa celerio*: "Heterochroa celerio Bates ♂ Syntype det. R.I. Vane-Wright 1983//Illustrated in The Butterflies of Venezuela A. Neild, 1996//179//B.M. TYPE No. Rh. 9845 Heterochroa celerio ♂ Bates// B.C.A. Lep. Rhop. Adelpha celerio Bates Godman-Salvin Coll. 1916.-4.//♂//Polochic Valley F.D.G. & O.S.//Type H.T.//Syntype" (Fig. 40e,f). Fruhstorfer (1913) introduced the name *phintias* for a single Venezuelan specimen in the Tring Museum (now the BMNH(R)), later placing it as a subspecies of "*A. celerio*" and stating that it differed from typical *A. s. celerio* in having a narrower orange DFW subapical marking (Fruhstorfer, 1915). However, this falls within the range of variation of *A. s. celerio* and *phintias* was synonymised with that name by Neild (1996). The two syntypes of Fruhstorfer's (1913) name *diademeta* (misspelt *diademata* by Fruhstorfer (1915) and placed as a subspecies of "*A. celerio*") are in the BMNH, and show little evidence of the broader postdiscal bands that Fruhstorfer (1915) claimed distinguished them from typical *A. s. celerio*. The name was synonymised with *A. s. celerio* by Hall (1938), but has been used by recent authors for Mexican *A. serpa* (de la Maza & de la Maza, 1993; Vargas *et al*., 1996; Warren *et al*., 1998). However, there appear to be no consistent differences between west Mexican and remaining Mexican *A. serpa* and the name was synonymised with *celerio* by Willmott & Hall (1999).

Adelpha s. celerio was first placed as a subspecies ("variety") of *A. serpa* by Kirby (1871), but has been treated usually as a full species (Fruhstorfer, 1915; DeVries, 1987; Lamas & Small, 1992). However, the principal characters that distinguish the two taxa, the DFW postdiscal band and ventral submarginal series, are intermediate in form in the intervening *A. s. diadochus*, with which intergrades to *A. s. celerio* occasionally occur in Colombia.

Range: Mexico to western Colombia, to northwestern Venezuela, extending along the base of the eastern Andes as far south as Meta in Colombia.

Immature stages: The eggs are deposited singly up to several times per plant in Costa Rica (DeVries, 1986), and always at the leaf tip in Mexico (Comstock & Vázquez, 1961). The larvae and pupa of this taxon were described and the egg, final instar and pupa figured by Comstock & Vázquez (1961), while Aiello (1984) figured the head capsule (fig. 2) and pupa (fig. 6) from Panama. DeVries (1986, 1987) also gives early stage information on this species from Costa Rica and figures the pupa (Fig. 24, F). The first and last of these records may also apply to several other members of the *A. serpa* group, especially *A. seriphia godmani*, but *A. serpa celerio* is the most plausible species. The following description of the egg and early instars is from Comstock & Vázquez (1961), and of the final instar and pupa from those authors and Aiello (1984). The egg is typical of the genus, with hexagonal concave facets marked with long setae. The first instar is deep olive-green, paler ventrally, with short dorsal tubercles, and the head capsule is medium and dark brown. The second instar (possibly) is yellowish brown and completely covered in small tubercles, the subdorsal set of which are branched, and the head capsule is dark brown surrounded by a ring of yellowish brown chalazae. Later instars are mottled brown, develop pronounced scoli on T2, T3, A2, A7 and A8, and have the typical long chalazae and vertical dark stripes on the head capsule. The final instar is dark brown (Comstock and Vázquez) or black dorsally and vivid green laterally, with pinkish lateral spots on A2-4, A7 and A8 (Aiello). The scoli are green, tipped with brown, except for those on A2, which are dark brown or black. The scolus on A2 is long, slender and straight, inclined slightly posteriorly, with sparse, ascending spines, with those near the tip slightly swollen. The subspiracular scoli on A2-4 are pale lime and bright green, and a black subspiracular stripe crosses the thorax, bends sharply in A1 and joins with the scolus on A2 (Aiello). The legs and pro-legs are yellowish brown, and the last three segments of the abdomen almost white ventrally (Comstock & Vázquez). A few days before pupation the scoli on T3, A7 and A8, and the pinkish lateral marks, become green, and just prior to pupation the larva fades to a yellowish brown (lemon yellow with black scoli and a dark spot on the dorsum (DeVries, 1987)). The pupa (Fig. 10, 117) is shimmering silver with the sutures lined with black, the dorsal projection on A2 is small, and the head horns are long and only slightly curved near the tip.

In Costa Rica, the larvae are solitary and feed on all leaves, and early instars make frass chains, while later instars rest on the upper surface of the leaf, on plants in direct sunlight in swampy areas near river or forest edges, or in forest clearings (DeVries, 1986). Like all other *Adelpha*, early instars leave the leaf mid-rib intact, on which they rest (Comstock & Vázquez, 1961). The larva rests in the curled position with the posterior end elevated, and resembles a piece of moss and lichen (Aiello, 1984) or a moss-covered twig (DeVries, 1987). Comstock & Vázquez (1961) report that the larval stages took approximately a month and the pupa 6 days to develop in Mexico, while specimen label data indicate that a pupa in the PJD took 8 days.

Habitat and adult ecology: *Adelpha serpa celerio* is common in a wide variety of habitats, from wet to moist rain forest and dry forest (DeVries, 1987; de la Maza & de la Maza, 1993). It has been recorded from sea level to 1700m throughout its range (specimen data; de la Maza & de la Maza, 1993), and specimen label data indicate that it flies throughout the year. I have observed females flying along forest edges in Mexico, while Ross (1976) reports it to be common to abundant in the Sierra de Tuxtla, Mexico, along forest margins and in pastures. DeVries (1987) notes that the species is attracted to rotting fruits but does not specify the sex. Srygley & Chai (1990) found this subspecies to be palatable to jacamars in Costa Rica.

Specimens examined (210♂, 226♀): † - trans. to *A. s. diadochus*.

MEXICO (83♂, 95♀): *Chiapas*: Campet 1♂ AME; Cuauhtémoc 700m Feb. 1♂ AME; La Granja 1♀ AMNH; Las Delicias Sep. 1♀ AME; Mapastepec Aug. 1♀ AME; Tapachula Jan. 1♂ FSCA; San Jerónimo Mar. Sep. Nov. 3♂ AMNH, 1♂, 1♀ AME; San José del Carmen Apr. 1♂ FSCA; no specific locality 3♂, 1♀ AMNH; *Colima*: Colima 2♀ AMNH; *Guerrero*: Acahuizotla Aug. Sep. 2♂, 7♀ AME; El Treinte Sep. 1♀ AMNH; Rincón 2800' 1♀ BMNH; no specific locality 7♂, 5♀ BMNH; *Hidalgo*: Pisaflores Aug. 1♀ AMNH; *Jalisco*: San Sebastián 1♀ BMNH; *Michoacán*: Playa Azul Aug. 1♂ FSCA; *Nayarit*: Jalisco Sep. 1♀ AMNH; *Oaxaca*: Candelaria Loxicha Aug.-Oct. 1♂, 2♀ AME, 4♀ AMNH; Chiltepec Aug. 1♂, 1♀ AME; Chimalapa Oct. 1♂ AME; El Naranjal Chiltepec May 1♀ AMNH; Mixtepec Dec. 1♀ AMNH; Oaxaca Jun. Aug. 4♂, 2♀ AME, 1♂ BMNH; nr. Puerto Eligio 700m Jul. 1♂ KWJH; San Mateo Yetla May 1♂ USNM; Soyolapan el Bajo Oct. 4♂, 6♀ AMNH; Tuxtepec Aug. 1♀ AMNH; Valle Nacional 800m Jul. 1♂ MUSM; *Puebla*: Tequelquitla 625m Aug. Sep. 2♂, 1♀ MUSM; Xicotepec de Juárez 1♀ MNHN; *San Luís Potosí*: Arroyo Seco Oct. 1♀ AMNH; Ciudad Valles 2♂ AMNH, 1♀ FSCA; El Salto Falls 860m Feb. Aug. Nov. 1♀ USNM, 1♂ FSCA, 3♂, 1♀ AME; Palitla Dec. 3♀ AMNH; Picolco May 1♀ AMNH; Tamazunchale Aug. Dec. 2♀ AMNH, 1♀ FSCA; Xilitla 1♀ AMNH; *Tabasco*: Tepescuintla Aug. 3♂, 3♀ AMNH; *Tamaulipas*: Mante, 30 mi. N., Nov. 1♂ USNM; *Veracruz*: Catemaco Jul.-Sep. 1♂, 1♀ FSCA, 1♂, 2♀ AME; Coatepec 1♀ USNM; Córdoba Jun. Jul. Sep. Nov. 2♂, 5♀ BMNH, 2♂, 1♀ AMNH, 2♀ BMB, 1♀ MUSM, 1♀ MCZ; Dos Amates Aug. 1♂, 4♀ AME; Los Tuxtlas 200m Jul. 1♂ KWJH; Fortín 1♂ ZMHU, 1♂ FSCA; Jalapa 1♂, 1♀ USNM, 2♂ AMNH; Minatitlán Jul. 1♂ AMNH; Misantla 1♂, 1♀ BMNH, 1♀ BMB; Nanchital sea level Feb. 1♂ AME; Popoctepetl, Tuxtla 400m Oct. 3♂ MUSM; Presidio Jul.-Sep. 5♂, 2♀ AME, 4♂, 1♀ AMNH; nr. Sontecomapan 300m Jul. 2♀ KWJH; Tezonapa Jun. Nov. 1♀ AMNH, 1♂ AME; *Not located*: W. Mexico 1♂, 1♀ BMNH; no specific locality 1♂, 3♀ USNM, 2♂ BMNH, 1♀ BMB, 2♂, 2♀ MNHN, 2♀ AMNH. **GUATEMALA** (31♂, 20♀): *Alta Verapaz*: Baléu 1350m Jun. Aug. 2♂, 2♀ AMNH, 1♂, 2♀ AME, 1♂ MUSM; Chiacám 2♂, 1♀ BMNH; Choctún 1♂ BMNH; La Vega del Cuajilote 750m Aug. 1♀ AME; Polochic Valley 3♂ BMNH; Tamahú 1100m Nov. 2♂ AMNH; *Baja Verapaz*: Chuacús 1♂ BMNH; Panimá 1♀ BMNH; San Jerónimo 1♀ BMNH; *Chiquimula*: no specific locality 600m 1♀ MNHN; *El Petén*: Sayaxché Sep. Oct. 2♂, 2♀ AMNH; *Escuintla*: Escuintla Jul. Aug. 2♂, 1♀ BMB; Palín Oct. 1♀ USNM, 2♂ BMB; *Izabal*: Cayuga 1♂ USNM; Puerto Barrios Dec. 1♂, 1♀ BMB; Quiriguá 4-5000' Feb. 1♂ BMB; Tenedores Nov. 1♂ AME; *Retalhuleu*: Retalhuleu 1♂ BMNH; San Sebastián 2♀ USNM; *Santa Rosa*: Barbarena 1♂ AME; Guazacapán 4♂ BMNH, 1♀ BMB; *Suchitepéquez*: Mazatenango Jul. Aug. 1♀ BMB; *Not located*: Central valleys 1♀ BMNH; no specific locality 1♀ ZMHU, 1♂ BMNH, 1♂ MNHN. **BELIZE** (3♂, 3♀): *Stann Creek*: Hummingbird Hwy. Nov. 1♂ AME; Stann Creek 125m Sep. Oct. 2♂, 2♀ FSCA; *Toledo*: Río Grande 1♀ AMNH. **EL SALVADOR** (3♂, 6♀): *San Salvador*: Ilopango 500m Feb. *ex* larva Melastomaceae 1♀ AME; San Salvador Jan. 2♀ AME; Santa Tecla Oct. 1♀ USNM; *Santa Ana*: Cerro San Jacinto 800m Dec. 2♂ AME; Citalá 800m Oct. 1♀ AME; *Usulután*: San Augustín 3500' Sep. Oct. 1♀ BMNH, 1♂ BMB. **HONDURAS** (3♂, 9♀): *Comayagua*: Comayagua Jun. 2♀ MCZ; *Cortés*: La Cumbre Feb. 1♂ BMNH; San Pedro Sula Dec. 4♀ BMNH, 1♀ USNM; *Not located*: Petuc 1♀ AMNH; no specific locality 1♂, 1♀ ZMHU, 1♂ BMNH. **NICARAGUA** (3♂, 4♀): *Chontales*: Chontales 2♂, 2♀ BMNH; *Zelaya*: San Ramón 375' Jul. 1♀ BMNH; *Not located*: no specific locality 1♂, 1♀ BMNH. **COSTA RICA** (12♂, 19♀): *Alajuela*: Cariblanco 1♀ BMNH; Esperanza 1♂ USNM; San Mateo 1-2000' Sep. Nov. Dec. 2♂, 1♀ USNM, 2♀ BMNH; *Cartago*: Juan Viñas 2500-3000' Nov. Jan. 1♀ USNM, 1♀ BMB; Volcán Irazú 6-7000' 1♀ BMNH; *Heredia*: Chilamate 37m Dec. 2♀ FSCA; *Limón*: Guápiles Jun. 1♀ FSCA; *Puntarenas*: Esquinas Aug. 1♀ USNM; Palmar Norte Aug. 1♂ USNM; Caldera 250' Oct. 1♂ BMB; *San José*: Carrillo Sep. Oct. 2♂ BMNH, 2♀ BMB; San José 1♀ BMNH; *Not located*: no specific locality 3♂, 2♀ BMNH, 2♂ BMB, 1♂, 2♀ AMNH, 1♂, 1♀ MNHN. **PANAMA** (26♂, 25♀): *Chiriquí*: Bugaba 800-1500' 2♂, 2♀ BMNH; Chiriquí 1♂, 1♀ ZMHU, 2♂ BMNH, 3♂ BMB; David 1♀ BMNH; V. de Chiriquí 25-4000' 2♂ BMNH; Potrerillos 3600' Feb. Mar. 1♂, 4♀ USNM; Río Tolé 120m Jan. 2♀ USNM; Santa Clara 1200m Jun. 1♂ USNM; *Coclé*: El Valle Dec. 1♀ BMNH; *Colón*: Lion Hill 1♂ BMNH; Piña 100m Apr. 1♀ FSCA; Pipeline rd. 1♀ STRI; *Panamá*: Aiello Lot 82-41, 1♂, Lot 84-10 no.2, 1♀, Lot 93-90, 1♀ STRI; Barro Colorado Island Feb. 1♂ AMNH; Cerro Campana 2500' Jul. Aug. Nov. 1♂, 2♀ USNM, 1♀ STRI; Cerro Jefe 900m Mar. 1♂ USNM; Empire Feb. 1♂ BMB; Río Bayano Oct. Nov. 2♂ USNM; Vique Pt. Feb. 1♀ BMNH; *Veraguas*: Santa Fé 230m Oct. 1♂ USNM; no specific locality 1♂, 2♀ BMNH; *Not located*: Isthmus of Panamá 3♂, 1♀ BMNH; no specific locality 1♂,1♀ BMNH, 2♀ AMNH. **COLOMBIA** (37♂, 23♀): *Antioquia*: Río Cocorná 1000m Aug. 1♂ AME; *Boyacá*: Muzo Jun. Jul. 2♂ BMB; Otanche Feb. Aug. Dec. 2♂ JFL, 2♀ ESM; *Caldas*: Quebrada El Aguila, Manizales 1700m Aug. 1♀ MHNUC; Victoria Mar. 1♂ ESM; *Cauca*: Pescador 1450m Feb. Dec. 1♂, 2♀ AME; *Cundinamarca*: Bogotá 1♀ USNM, 4♂(1†) BMNH, 1♀ BMB, 2♀ MCZ; env. Bogotá 2♂, 3♀† BMNH; El Baldio 5400' Sep. 1♂† BMB; Veragua 2♂ MNHN; *El César*: Manaure 1♂† BMNH; *Risaralda*: Hda. Bacorí, Pblo. Rico 450m Jul. 1♂ MHNUC; *Santander*: Landázuri Jan. 1♂ AMNH; La Borroscosa Nov. 1♂ AMNH; *Tolima*: Honda 1♀ BMNH; *Valle del Cauca*: Cali 1000m Dec. 1♀ MUSM; Cali, Club Campestre 1000-1100m Apr. Jul. 1♂, 1♀ LMC; El Cerrito Apr. 1♂ LMC; Pance 1200m May Jun. 2♂ LMC; Yatacué, Alto Anchicayá Sep. 1♀ LMC; Zacarias Apr. 1♂ LMC; *Not located*: east Colombia 1♀ USNM; "Ecuador Río Ayada vic. Dec." 1♀ USNM-error; no specific locality 8♂, 2♀ AMNH, 1♂, 1♀ ZMHU, 2♀ BMNH, 2♂† BMB, 1♂ MCZ. **VENEZUELA** (4♂, 14♀): *Aragua*: Portochuelo 1100m Aug. 1♀ MUSM; *Carabobo*: Puerto Cabello 1♀ ZMHU; *Mérida*: Mérida 1♂ BMNH, 1♂ ZMHU; Montan. Sierra 3000m Aug. 1♀ BMNH; Mucutín 2600m 2♂† BMNH, 2♀ BMB; *Táchira*: Hda. Pánaga 800m Feb. 7♀ AFEN; no specific locality 1♀ AFEN; *Not located*: no specific locality 1♀ USNM. "**BRAZIL**" (1♀): *Santa Catharina*: no specific locality 1♀ BMB-error. **COUNTRY UNKNOWN** (5♂, 7♀): Central America 1♂ AMNH; no specific locality 1♀ BMNH, 1♀ BMB, 1♀ MNHN, 4♂, 3♀ MCZ, 1♀ AMNH.

Additional locality data: **MEXICO**: *Chiapas*: throughout - see de la Maza & de la Maza (1993); *Colima*: Cofradía de Suchitlán 130m Nov. (Warren *et al*., 1998); *Jalisco*: nr. Barra de Navidad Dec.; La Calera Apr.; Est. Científica Las Joyas Sep.; Mismaloya Jan. Dec.; Pihuamo Sep.; Puerto Vallarta Oct.; 53 km S. Puerto Vallarta Jan. (Vargas *et al*., 1996). **BELIZE**: *Cayo*: Caracol, Slate Creek Preserve (Meerman, 1999).

Adelpha serpa duiliae Fruhstorfer, 1913

Figs. **40g,h**; *283*

Adelpha duiliae Fruhstorfer (1913: pl. 107d; 1915: 531)

TL: [Chimbo and Paramba, Ecuador]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//celerio duiliae Fruhst.//Chimbo 1000' VII 97 (Rosenberg)//TYPE//Type//Syntype"; **BMNH**(R): **ST**♂: "celerio duiliae Fruhst.//Paramba 3500' III. 97 dry season (Rosenberg)//Syntype//TYPE" [both examined]

Adelpha celerio duiliae Fruhst., Fruhstorfer (1915); *Adelpha serpa duiliae* Fruhst., Hall (1938)

Identification, taxonomy and variation:

Adelpha serpa duiliae is distinguished from *A. s. celerio* by having postdiscal bands which are narrower, composed of more isolated spots on the DFW and typically more deeply tinted blue-green, in addition to a narrower DFW orange subapical marking which is dissected by more heavily marked veins. It is very similar to the sympatric *A. seriphia godmani*, but that species is distinguished by having even more displaced spots forming the DFW postdiscal band, the orange DFW subapical marking orientated more vertically (notably the basal edge), and the inner submarginal series on the VHW is not parallel to the orange postdiscal band, but much closer in cells M_1-Rs and Rs-Sc+R_1.

Fruhstorfer (1913) clearly figured *duiliae* and later described it as a subspecies of "*A. celerio*" based on specimens from Chimbo and Paramba (Fruhstorfer, 1915), and there are two syntypes in the BMNH. Hall (1938) placed it as a subspecies of *A. serpa*.

Range: Western Ecuador, as far south as Bolívar Province, possibly also occurring in extreme southwestern Colombia.

Habitat and adult ecology: This subspecies is local but not uncommon from near sea level to 1400m in large clearings or secondary growth areas in the vicinity of primary or secondary forest. Males may be encountered in the afternoon perching singly with the wings closed on small bushes, 2-3m high, in open areas along rivers, or from 4-8m high on ridge tops. Males are very wary when perching, and if disturbed will take flight to another perch, often up to 30m away. Females are usually found flying in areas of secondary growth along forest edges or even roadsides throughout the middle of the day. The thinning of the dorsal postdiscal band, its greenish coloration and the reduction of the orange DFW subapical marking in this subspecies parallels similar features in the sympatric *A. iphiclus estrecha*, suggesting that the two are co-mimetic.

Specimens examined (7♂, 6♀):

ECUADOR (7♂, 7♀): *Bolívar*: Chimbo 1000' Aug. 1♂ BMNH; *Carchi*: Las Juntas, nr. La Carolina 1400m Nov. 1♂ KWJH; Lita, ridge east of Río Baboso 900m Jul. 2♂, 1♀ KWJH; *Esmeraldas*: Est. Ex. La Chiquita 50m Dec. 1♂ KWJH; *Imbabura*: Paramba 3500' Mar. 1♂ BMNH; *Los Ríos*: La Chima Jun. Jul. 1♀ BMNH; *Pichincha*: Quito-Sto. Domingo old rd. km 85, 4400' Jul. 1♀ FSCA; Río Sucio, nr. San Miguel de los Bancos Apr. 1♂ KWJH; Salto de Napac, km 35 Sto. Domingo-Quito rd. 1000m Jul. 1♀ KWJH; Tinalandia Jun. 1♀ FSCA; *Not located*: Oriente 1♀ AMNH-error.

Adelpha seriphia (C. & R. Felder, 1867)

Figs. **41**; 132; 216; *283*

Identification, taxonomy and variation:

Adelpha seriphia is distinguished from all related species by the VHW inner submarginal series not being parallel to the orange postdiscal band, but noticeably closer in cells M_1-Rs and Rs-Sc+R_1, in all subspecies except for *A. s. barcanti*. In comparison with sympatric subspecies of *A. serpa*, the blocks that compose the DFW postdiscal band are always more displaced diagonally, and the DFW orange subapical marking is orientated more vertically. Certain subspecies of *A. hyas* are very similar, but are smaller, and have the base of the VFW costa white rather than orange. There is much variation in the width of the postdiscal bands, the form of the orange dorsal postdiscal markings and the ventral submarginal series, and seven subspecies are recognised, one of which is described here.

The systematic status of this species has always been uncertain, largely due to the rarity of specimens in collections, and many authors have regarded the various taxa as forms of *A. serpa*. The two are sometimes similar in sympatric populations, although *A. seriphia* tends to be found at higher altitudes and therefore sometimes develops a completely distinct dorsal pattern (e.g., *Adelpha s. pione*) due to mimicry with other locally occurring species. Fruhstorfer (1915) recognised *A. seriphia* as a distinct species almost as treated here, with the exception of then undescribed taxa and the Central American *A. seriphia godmani*, which was finally correctly placed by Neild (1996). The shape of the VFW subapical marking and its tendency to have darker intruding lines, in addition to the displaced blocks of the DFW postdiscal band, suggest that *A. seriphia* is probably most closely related to *A. hyas*, which occurs at lower altitudes in the eastern Andes. Most subspecies of *A. seriphia* are still poorly represented in collections, and, particularly in Colombia, accurate locality data are often lacking. Further collecting may well demonstrate certain subspecies recognised here to be composed of more than one taxon, or conversely, to be merely part of clinal variation.

Range and status: Mexico to western Ecuador, Venezuela to Bolivia, Trinidad. Usually in montane habitats from 750-2600m, everywhere local and uncommon to rare, several subspecies with restricted and isolated ranges.

Specimens examined: 200 (97♂, 103♀)

Adelpha seriphia seriphia (C. & R. Felder, 1867)

Figs. **41a,b**; *283*

Heterochroa seriphia C. & R. Felder (1867: 423)

TL: Venezuela. **OTL**: Caracas, Venezuela; Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **LT**♀: “Lectotype//type//Felder Colln.//Venezuela Moritz//seriphia Feld.//seriphia Felder//Illustrated in The Butterflies of Venezuela A. Neild, 1996//168//Heterochroa seriphia C. & R. Felder, lectotype ♀ det. R.I. Vane-Wright 1983 - see Hall, 1938: 284”; **PLT**?♀: “Heterochroa seriphia C. & R. Felder, ?paralectotype ♀ det. R.I. Vane-Wright 1983//Venezuela//Felder Colln.” [both examined]

Adelpha serpa var. *seriphia* Fldr., Kirby (1871); *Adelpha seriphia seriphia* Fldr., Neild (1996)

Identification, taxonomy and variation:

The nominate subspecies is similar to *A. seriphia pione*, from which it differs in having broader postdiscal bands and reduced (occasionally absent) orange postdiscal dashes on the dorsal surface. *Adelpha s. aquillia* also has narrower postdiscal bands and typically lacks any orange dorsal postdiscal dashes. *Adelpha seriphia seriphia* is similar to *A. serpa celerio* and *A. serpa diadochus*, but may be distinguished as detailed under the account for the species as a whole. The orange postdiscal dashes on the DHW are somewhat variable, and may be absent altogether, particularly in males.

Felder & Felder (1867) described this species as being similar to *A. serpa*, except for an orange postdiscal band on the dorsal surface extending to the anal margin. They did not specify the number or sex of specimens on which the description was based, only that the specimens came from Caracas, collected by Dr. Moritz, and Bogotá, collected by Lindig, and were in their collection. Since specimens from Caracas and Bogotá are referable to separate subspecies, I designate a female specimen in the BMNH(R) with the following label data as the lectotype of *Heterochroa seriphia*: “Lectotype//type//Felder Colln.//Venezuela Moritz//seriphia Feld.//seriphia Felder//Illustrated in The Butterflies of Venezuela A. Neild, 1996//168//Heterochroa seriphia C. & R. Felder, lectotype & det. R.I. Vane-Wright 1983 - see Hall, 1938: 284”. Although this specimen was figured by Neild (1996: pl. 4, fig. 169) as the “Lectotype”, this was based on the specimen label rather than a published designation.

The nominate subspecies is very similar, and very occasionally indistinguishable from, *A. s. aquillia*, but the latter is retained here since it is usually readily identified and is separated from the nominate by the distinctive and geographically intervening subspecies *A. s. pione*.

Range: Cordillera de la Costa in northern Venezuela, possibly also the Sierra de Turimiquire.

Habitat and adult ecology: Little has been reported on the habitat or behaviour of this subspecies, which is rare in collections and represented predominantly by females. The available data indicate that it occurs from 900-1100m and has been collected in January, June, September and October.

Specimens examined (3♂, 9♀):

VENEZUELA (3♂, 6♀): *Aragua*: Rancho Grande 1100m Jan. Jun. 1♀ AMNH, 1♂ USNM; *Distrito Federal*: Caracas 3000' Sep. Oct. 1♂ AME, 1♀ BMB; *Not located*: no specific locality 1♂, 4♀ BMNH. **COUNTRY UNKNOWN** (3♀): no specific locality 3♀ BMNH.

Adelpha seriphia pione Godman & Salvin, 1884

Figs. **41c,d**; *283*

Adelpha pione Godman & Salvin (1884: 309, Tab. XXIX, figs. 16, 17)

TL: “Chiriquí, Panama”-erroneous. **Types**: **ZMHU**: **HT**♀: “Chiriquí//Origin//Adelpha pione type//holotype” [examined]

Adelpha seriphia pione G. & S., Fruhstorfer (1915); *Adelpha serpa pione* G. & S., Hall (1938); *Adelpha seriphia pione* G. & S., Lamas & Small (1992)

Identification, taxonomy and variation:

Adelpha seriphia pione is distinguished from the nominate subspecies by the broader orange postdiscal markings on the dorsal surface and the narrower white postdiscal band. It is also very similar to the disjunct *A. s. therasia*, but differs in having the spots of the inner submarginal series on the VHW less clearly divided by dark rays in each cell. There is some variation in the thickness of the dorsal orange postdiscal markings, particularly in specimens labelled "Bogotá", which are probably transitional to *A. s. aquillia*. See also the discussion under *A. s. aquillia* concerning the paralectotype of *aquillia* from Ocaña, Colombia.

Godman & Salvin (1884) described and clearly figured *pione* based on a single female in Staudinger's collection from "Chiriquí" in Panama. I have examined the holotype in the ZMHU. The specimen is clearly, however, very similar to certain specimens from Colombia and Venezuela, and I conclude it is mislabelled and actually originated in one of those countries. No other specimens of *pione* are known from Panama, nor are any *Adelpha* with similar dorsal patterns to *pione*, which is probably co-mimetic with the Andean *A. corcyra corcyra* and *A. alala completa*. I also regard the taxon *godmani* as the Panamanian subspecies of *A. seriphia*.

Fruhstorfer (1915) first placed *pione* as a subspecies of *A. seriphia*, but Hall (1938) regarded it as a subspecies of *A. serpa*, in which he was followed by D'Abrera (1987), until Lamas & Small (1992) restored it to Fruhstorfer's correct original combination.

Range: *Adelpha seriphia pione* occurs in Venezuela in the Cordilleras de Mérida and Tamá, to the Colombian Cordillera Oriental north of Bogotá. Neild (1996) reports the subspecies in Venezuela from the Sierra de Perijá, based on a single specimen collected at El Tucuco, at 400m. This is a most unlikely altitude for this subspecies, suggesting that the specimen may be mislabelled, although it could also have been collected higher up from this site. At present, I regard its presence in the Sierra de Perijá as requiring confirmation, especially in view of the paralectotype specimen of *A. s. aquillia* (see discussion under that taxon).

Immature stages: Andres Orellana (pers. comm.) reports that the second instar of this taxon in Venezuela is similar to *A. serpa celerio*, but with longer thoracic scoli and less green on the body.

Habitat and adult ecology: This subspecies is not uncommon, and has been recorded from 900-2600m, perhaps as high as 3000m, in montane forest habitats. Neild (1996) reports that it might occur down to near sea level, though he may be referring to the nominate subspecies. Pyrcz reports (*In*: Neild, 1996) that the female is attracted to rotting fruit baits, while I have observed a male puddling at damp sand along a stream below the town of Mérida. The subspecies seems quite tolerant of habitat disturbance, Pyrcz's observations (*In*: Neild, 1996) of a number of individuals at a flowering tree were made in the grounds of the Facultad de Ciencias Naturales in Mérida. The range of this subspecies closely corresponds with that of *A. alala completa* and *A. corcyra corcyra*, which also occur in similar montane habitats, and the development of orange dorsal postdiscal bands in each of these three subspecies of relatively unrelated species is strong evidence of a mimetic relationship.

Specimens examined (29♂, 26♀):

"**HONDURAS**" (1♂): *Cortés*: San Pedro Sula 1♂ BMB-error. "**PANAMA**" (1♂): *Chiriquí*: Chiriquí 1♂ ZMHU-error. **COLOMBIA** (14♂, 12♀): *Boyacá*: Otanche 900m Aug. 1♂ MHNUC; *Cundinamarca*: Bogotá 1♂ USNM, 7♂, 6♀ BMNH; *Norte de Santander*: Ocaña 1♂ ZMHU; Pamplona-Sanare 2200m Mar. 1♂ ESM; Virolín 2300m Mar. 2♂ JFL; *Not located*: Interior 1♀ BMB; no specific locality 1♀ USNM, 3♀ BMNH, 2♂ BMB, 1♀ AMNH. **VENEZUELA** (13♂, 13♀): *Mérida*: Culata 1♂ BMNH; Escorial Jan. 1♂ BMNH; Mérida 1400m Aug. 1♂ KWJH, 3♂, 1♀ BMNH; Montan. Japi 2-3000m Sep. 1♀ BMNH; Montan. Sierra 3000m Jul. 1♂ BMNH; Mucutín 2600m 1♂ BMNH, 1♂ BMB; Pedregosa 3000m Oct. 3♀ BMNH; Quebrada Campada, km 39 Barinitas-Las Uvas Jan. 1♂ MUSM; Quebrada Las Uvas, km 34 Barinitas-Apartaderos Jan. 1♀ MUSM; *Táchira*: Barinitas-Sto. Domingo 1♀ AFEN; San Vicente de la Revancha 2350m 3♀ AFEN; *Not located*: no specific locality 1♂, 2♀ BMNH, 2♂, 1♀ BMB. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ MCZ.

Adelpha seriphia aquillia Fruhstorfer, 1915

Figs. **41e,f**; *283*

Adelpha seriphia aquillia Fruhstorfer (1915: 531)

TL: Bogotá, Colombia. **OTL**: No locality stated; Ocaña, Colombia. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//seriphia aquillia Fruhst.//Bogotá Colombia//TYPE//Type//Syntype?"; **ZMHU**: **PLT**♂: "Ocaña Columb. Kalbr.//Syntype//SYNTYPE ♂ Adelpha seriphia aquillia Fruhstorfer G. Lamas det. 87//Adelpha spec. S. & G. [?illegible] ign." = *seriphia pione* [examined]

=*Adelpha seriphia naryce* Fruhstorfer (1915: 531)

TL: Chanchamayo, Peru. **Types**: **ZMHU**: **ST**♀: "Chanchamayo Thamm//Syntype//Seriphia var.//SYNTYPE ♂ Adelpha seriphia naryce Fruhstorfer G. Lamas det. '87" [examined]

=*Adelpha serpa celerio* Bates, Hall (1938); *Adelpha seriphia aquillia* Fruhst., Neild (1996)

Identification, taxonomy and variation:

Adelpha s. aquillia is distinguished from *A. s. pione* and *A. s. therasia* by the lack of orange postdiscal markings on the DHW, and only faint or absent orange postdiscal dashes on the DFW in cells 2A-M_3. It is very similar to *A. s. godmani*, but has more red coloration in the DFW discal cell and thinner postdiscal bands on the dorsal surface which tend to be of even width; in *A. s godmani* the blocks of the postdiscal band on the DFW decrease in width from the anal margin to cell Cu_1-M_3. The VFW pale subapical marking in *A. s. aquillia* has dark red-brown lines intruding in each cell, or expanding to colour most of the marking red-brown, while in *A. s. godmani* the marking lacks the intruding lines and is therefore paler. *Adelpha s. aquillia* is also very similar to *A. hyas hewitsoni*, but has thinner white postdiscal bands on the dorsal surface, the base of the VFW costa is orange instead of white, and on the VHW the orange band of the outer postdiscal series is straight rather than convex and the markings of the inner submarginal series are wider. *Adelpha serpa diadochus* may be distinguished by the much broader dorsal postdiscal bands and by not having dark lines intruding into the VFW pale subapical marking, in addition to other characters that distinguish *A. serpa* from *A. seriphia*. The width of the white postdiscal bands may vary slightly, as does the shape of the hindwing band, and the width of the DFW orange subapical marking is particularly variable, being very narrow in certain Colombian specimens from the Cordillera Central. I have been unable to discern any consistent geographic variation in the limited series examined, but it may well be the case that future collecting will demonstrate such variation to exist.

Fruhstorfer (1915) described *aquillia* based on a male in his collection "with reduced reddish-brown band of the forewings" in comparison with *A. s. seriphia*, but did not state where the specimen was collected. He also stated that the name applied to "some more specimens from Ocaña (Colombia) of the coll. Staudinger in the Berlin Museum". A male specimen in the BMNH(T) from Fruhstorfer's collection bears the handwritten label "seriphia aquillia Fruhst." and is from "Bogotá". This supposed syntype differs from the only specimen of *A. seriphia* that I have been able to locate in

Staudinger's collection at the ZMHU from Ocaña in lacking any orange postdiscal dashes on the dorsal surface between cell Cu_1-M_3 of the DFW to cell Cu_2-Cu_1 of the DHW; the ZMHU syntype has thin, isolated orange dashes in each cell similar to nominate *A. seriphia*. I believe that Fruhstorfer was referring to the entire postdiscal series on the DFW as his "reddish-brown band", in which case both the BMNH specimen, which lacks the markings in cells Cu_1-M_3 to 2A-Cu_2, and the ZMHU specimen, which has slight orange markings in these cells, fit this description. I therefore regard both of these specimens as valid syntypes. Two lines later, Fruhstorfer (1915) described an unspecified number of specimens from Chanchamayo as *A. seriphia naryce*, which he stated resembled *aquillia* on the dorsal surface, but were similar on the ventral surface to a third new subspecies, *therasia* (see below). A female specimen of *A. seriphia* in the ZMHU from Chanchamayo is probably the specimen on which Fruhstorfer based his description of *naryce*, and closely matches the original description. It differs from *A. s. aquillia* and *A. s. pione*, and is similar to *A. s therasia*, by having on the ventral surface broader submarginal series, the spots of which are less sharply defined, paler, and merge with the forewing subapical marking. This specimen has slight orange postdiscal scaling on the DFW in cells 2A-M_3, but otherwise closely resembles females from northern Peru to southeastern Colombia. Since I have seen no other specimens of *A. seriphia* from central Peru, for the present I regard the putative syntype female of *naryce* as representing the same taxon as specimens from northern Peru to southeastern Colombia, although it may prove to be distinct. The remaining problem is whether to regard *naryce* or *aquillia* as the name that should be applied to this taxon. The Ocaña syntype of *aquillia* is something of a taxonomic mystery, since it originates from the northern tip of the Cordillera Oriental at the northern edge of the range of *A. seriphia pione*. It may represent either a specimen of, or an intergrade to, an undescribed subspecies further north in the Sierra de Perijá, since no subspecies of *A. seriphia* has definitely been recorded there to date. Possibly it may also be an extreme variant of typical *A. s. pione*. Since the Bogotá syntype of *aquillia* occurs at the southern limit of the range of *A. s. pione*, it must represent a different taxon to the Ocaña syntype. Given that the Bogotá syntype is clearly referable to the subspecies that occurs throughout central Colombia to the eastern Andes, and the lack of information concerning the taxonomic status of the Ocaña specimen, I regard the latter for the present as a specimen of *A. pione* and designate the former as the lectotype of *Adelpha seriphia aquillia*, with the following label data: "Fruhstorfer Coll. B.M. 1937-285//seriphia aquillia Fruhst.//Bogotá Colombia//TYPE//Type//Syntype?". Since specimens from north Peru to southeastern Colombia clearly predominate in collections I choose to apply the name *aquillia* to this taxon in the interests of nomenclatural stability, and regard *naryce* as a synonym for the present, as did Willmott & Hall (1999); should *naryce* apply to a distinct subspecies the name is still available for use.

Finally, on a historical note, it must be mentioned that Hall (1938) synonymised *aquillia* with *A. serpa celerio*, and *naryce* with *A. serpa duiliae*, while Neild (1996) resurrected *aquillia* as a subspecies of *A. seriphia*.

Range: *Adelpha seriphia aquillia* appears to occur in Colombia in the Cordillera Oriental south of Bogotá, probably on both slopes, on both slopes of the Cordillera Central and the eastern slope of the Cordillera Occidental, to central Peru on the east Andean slopes. More specimens are needed to accurately determine the range within Colombia. There is some evidence of sympatry with *A. seriphia godmani* on the western slopes of the Cordillera Central, in the Caldas and Quindío areas, possibly representing a contact zone between the two subspecies.

Immature stages: There is a pupa in the BMNH labelled "San Antonio, West Cordillera, Colombia 2000m (A. H. Fassl)" that is supposedly of this species. Given the altitude, it almost certainly is correctly identified, unless mislabelled. The pupa is very similar to that of *A. serpa*, and has a goldish sheen.

Habitat and adult ecology: This subspecies is rare in collections and in the field it is very local, but although females are typically found as solitary individuals in areas of secondary growth, when males are encountered they are usually found perching in small groups. In eastern Ecuador, I have observed males on wide paths along the crests of forested ridges, perching in periods of bright sun on the tops of 5-8m high bushes with their wings shut. From these perches they made frequent flights to investigate passing butterflies, and at one locality the same perch was used over a period of several months. Males are also attracted to traps baited with rotting fish. The subspecies is restricted to relatively intact cloud forest habitats from 1000-2000m, where it probably flies throughout the year.

Specimens examined (22♂, 17♀): † - trans. to *A. s. godmani*; ‡ - trans. to *A. s. pione*.

VENEZUELA (2♀): *Mérida*: Mérida 2♀‡ ZMHU-error?. **COLOMBIA** (16♂, 10♀): *Boyacá*: Otanche Apr. 1♀ JFL; *Caldas*: El Aguila 1700m Oct. 1♂†, 1♀† KWJH; Pensilvania 1000m May 1♂ JFL; *Cundinamarca*: Aguaditas, Fusagasugá Mar. 2♀ ESM; Bogotá 3♂ BMNH, 1♂ USNM, 1♂ BMB; *Nariño*: Monopamba 1750m Feb. 1♀ ESM(resembles nominate, thin orange thread DHW - mislabelled?); *Risaralda*: Pereira 1♂ BMNH; *Valle del Cauca*: Río Aguacatal 2000m 1♂, 1♀ BMNH; San Antonio 2000m 1♂ BMNH; *Not located*: no specific locality 2♂, 1♀ AMNH, 1♂, 2♀(1‡) ZMHU, 2♂, 1♀ BMNH. **ECUADOR** (4♂, 3♀): *Morona-Santiago*: Río Abanico 1600m Dec. 1♂ KWJH; *Sucumbíos*: Río Sucio, nr. La Bonita 1800m Nov. 1♀ KWJH; *Tungurahua*: Chinchin 1800m Nov. 1♂ KWJH; Río Verde 1600m Jun. 1♀ AMNH; *Not located*: Oriente 2♂ AMNH; "Tena" purchased 1♀ DAT. **PERU** (1♂, 2♀): *Amazonas*: Alfonso Ugarte 1000-1200m Jul. 1♂ MUSM; *Cajamarca*: Charape, N. Peru 1♀ BMNH; *Junín*: Chanchamayo 1♀ ZMHU. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Abanico Oct. Nov.; *Zamora-Chinchipe*: Zamora, ridge west of town 1450m May (Willmott & Hall, sight records).

Adelpha seriphia godmani Fruhstorfer, 1913

Figs. **41g,h**; 132; 216a,b; *283*

Adelpha godmani Fruhstorfer (1913: pl. 107d; 1915: 530)

TL: [Orizaba (Mexico)]. **Types**: **BMNH**(R): **ST**♂: "celerio fa. godmani Fruhst.//Syntype//TYPE//R//Orizaba" [examined]

=*Adelpha syrna* Steinhauser (1974: 4) **syn. nov.**

TL: not stated. **Types**: **BMNH**(M): **ST**♂: "Syntype ♂ Adelpha celerio f. syrna Fruhstorfer G. Lamas det. 1987//Fig. 14 G.D.H.C.//2//Genitalia slide No. 16-112 godmani Fruhst.//B.C.A. Lep. Rhop. Adelpha massilia Feld. Godman-Salvin Coll. 1916.-4.//♂//Córdova Mexico H. Rumeli//Syntype" [examined]

=*Adelpha celerio celerio* form *syrna* Fruhstorfer (1915: 530; fig. as *A. massilia*, *In*: Godman & Salvin (1884: Tab. XXIX, fig. 7, 8)) unavailable name

TL: not stated. **Types**: **BMNH**(M): **ST**♂: "Syntype ♂ Adelpha celerio f. syrna Fruhstorfer G. Lamas det. 1987//Fig. 14 G.D.H.C.//2//Genitalia slide No. 16-112 godmani Fruhst.//B.C.A. Lep. Rhop. Adelpha massilia Feld. Godman-Salvin Coll. 1916.-4.//♂//Córdova Mexico H. Rumeli//Syntype" [examined]

Adelpha massilia Fldr., Godman & Salvin (1884) misid.; *Adelpha celerio diademata* form *godmani* Fruhst., Fruhstorfer (1915); =*Adelpha serpa celerio* Bates, Hall (1938); *Adelpha serpa godmani* Fruhst., D'Abrera (1987), Salazar (1996); *Adelpha seriphia godmani* Fruhst., Neild (1996)

Identification, taxonomy and variation:

Adelpha seriphia godmani is most similar to *A. s. aquillia*, and is distinguished under that subspecies. It is distinguished from *A. serpa celerio* and *A. serpa duiliae* through the configuration of the VHW inner submarginal series that is diagnostic of the species (see under species account), the more diagonally displaced blocks of the DFW postdiscal band, and the more vertical orange subapical marking on the DFW. There is a little variation in the width of the orange DFW subapical marking, and in one female from Córdova, Mexico, there is a slight orange spot in cell Cu$_1$-M$_3$ of the DFW. The width of the postdiscal bands is quite constant. Four female specimens in the AME from Malinalco, Valle de Bravo and Chalma in Mexico differ from typical *A. s godmani* in having pure white postdiscal bands that are slightly broader and less disjointed between cells 2A-Cu$_2$ and Cu$_2$-Cu$_1$, the DFW orange subapical marking is entirely orange, without being dissected by darker veins, and extends slightly into cell Cu$_1$-M$_3$. These specimens may represent an undescribed subspecies, as they are reasonably isolated from remaining *A. seriphia godmani*, but I have seen insufficient specimens given the slight differences to warrant their description. Specimens from western Ecuador have, on the DFW, the postdiscal band and orange subapical marking notably narrower than typical *A. s. godmani*, but these differences do not seem sufficiently stable to justify separate subspecific status with the material available.

Fruhstorfer (1913) figured *godmani*, and subsequently described it (Fruhstorfer, 1915: 530), as a form of "*A. celerio diademata*" (=*A. serpa celerio*), based on a single male from Orizaba in the Tring Museum. The figure corresponds well with the unique syntype (Fig. 41g,h) (note that no indication was given of number of specimens in the original description by Fruhstorfer (1913)) in the BMNH(R), and even though the name was proposed in the text (1915) as a quadrinomial, since it appeared singly on the plate two years earlier in 1913 it should be treated as a specific and therefore available name. Shortly after, Fruhstorfer (1915) introduced the name *syrna* for "a melanotic form" of "*A. celerio celerio*" which was figured as *A. massilia* by Godman & Salvin (1884) on Tab. XXIX, figs. 7 & 8, supposedly differing from *godmani* in having a narrower orange DFW subapical marking. Although *syrna* Fruhstorfer is a quadrinomial, and is therefore unavailable, Steinhauser (1974) used it as a species name in discussing the *Adelpha* taxa occurring in the Miramundo cloud forest in El Salvador, and attributed the name to "Fruhstorfer, 1915". This makes the name available by "bibliographic reference" (ICZN, 1999: Art. 13.1.2) to Fruhstorfer's (1915) original description (ICZN, 1999: Art. 13.1.1), and Steinhauser therefore becomes the author of the new name *Adelpha syrna* (ICZN, 1999: Art. 45.5.1), which adopts the type material of Fruhstorfer's *syrna* (ICZN, 1999: Art. 72.4.4). Godman & Salvin (1884) stated that their specimens were obtained by Höge and Rümeli in southern Mexico, and a specimen matching their figure with appropriate label data is in the BMNH. In fact, the orange subapical marking in the original figure is represented as narrower than reality, and since the differences between the types of *syrna* and *godmani* fall within the normal bounds of variation in the subspecies, I follow Willmott & Hall (1999) in regarding them as belonging to the same taxon, and therefore regard *Adelpha syrna* Steinhauser as a synonym of *A. seriphia godmani* (**syn. nov.**).

This subspecies is very similar to *A. serpa celerio*, and indeed was synonymised with that taxon by Hall (1938). It is the only subspecies of *A. seriphia* known at that time which Fruhstorfer (1915) failed to associate with other *A. seriphia* taxa. Nevertheless, it has all the diagnostic characters of the species (see species discussion) and was first placed correctly as a subspecies of *A. seriphia* by Neild (1996).

Range: Mexico to western Ecuador, apparently also extending into the Cauca Valley of Colombia as far as the Quindío area, where it appears to broadly overlap with *A. seriphia aquillia*.

Habitat and adult ecology: *Adelpha seriphia godmani* is apparently not uncommon in Mexico, but elsewhere in its range it is local and rare. Although a single specimen has been recorded near sea level in Panama, and it has been reported as high as 2400m in Mexico (de la Maza & de la Maza, 1993) and El Salvador, it is typically encountered from around 700-1500m, in cloud forest habitats. Males are usually encountered perching in a variety of microhabitats, typically along ridge and hill tops where the vegetation exists in various degrees of disturbance. I have observed males in western Ecuador along a wide ridge top path, perching on bushes with their wings shut at the forest edge, around 3-6 m above the ground, while Raguso & Gloster (1996) reported males (as *A. serpa*) perching from 8-15m above the ground along forest edges and trails. Perching males are very wary, and at the slightest disturbance they quickly take flight along the ridge top to land on another suitable perch tens of metres away. Salazar (1996) also found males hill topping on Cerro Ingrumá in Colombia. Females are found in heavily disturbed forest habitats along forest edges, but also in tree fall light gaps in primary forest. The species is sympatric in western Ecuador with *A. serpa duiliae* and *A. iphiclus estrecha*, and since all three of these species exhibit narrower dorsal postdiscal bands and orange subapical markings, they are probably involved in mimicry.

Specimens examined (34♂, 39♀):
MEXICO (23♂, 28♀): *Chiapas*: Las Casas Mar. 1♂ FSCA; no specific locality 2♂, 5♀ AMNH; *Guerrero*: Iguala 1♂ AMNH; no specific locality 1♂ USNM; *México*: Chalma Jul. 1♀ AME; Malinalco Aug. Nov. 2♀ AME; Valle de Bravo Nov. 1♀ AME; *Oaxaca*: Chimalapa Jul. Sep. 1♂, 2♀ AME; Comitán Sep. 1♀ AME; *Veracruz*: Catemaco Sep. 1♂ AME; Córdoba 5♂, 2♀ BMNH; Fortín 1♂, 2♀ FSCA; Jalapa 4600' Nov. 2♀ USNM, 1♂, 1♀ BMB, 1♂ AME; Orizaba 1♂ BMNH; Presidio May Jul. 1♂, 1♀ AME; Santiago Tuxtla Sep. 1♀ AME; Selva Negra 1700m Aug. 1♀ AME; Sierra Mojarra Jul. 1♀ AME; Tezonapa Jun. 1♂ AME; Veracruz 1♂, 1♀ AMNH; *Not located*: no specific locality 1♂ USNM, 1♂, 1♀ BMNH, 2♀ MNHN, 1♂ MCZ, 1♂, 1♀ AMNH. **GUATEMALA** (1♂, 1♀): *Alta Verapaz*: Baléu Sep. 1♂ AMNH; *Santa Rosa*: Guazacapán 1♀ BMNH. **EL SALVADOR** (1♂, 1♀): *San Salvador*: Santa Tecla 900m Oct. 1♀ AME; *Santa Ana*: Metapán 2418m Dec. 1♂ AME. **COSTA RICA** (3♀): no specific locality 2♀ BMNH, 1♀ BMB. **PANAMA** (1♂, 1♀): *Colón*: Gatún May 1♀ STRI; *Herrera*: Cerro Alto Higo 1000m Dec. 1♂ USNM. **COLOMBIA** (4♂, 1♀): *Caldas*: Bocatoma, Manizales 2250m Feb. 1♀ MHNUC; Páramo de Letras 2200m Dec. 2♂ JFL; *Quindío*: Cerro Aguacatal 1600m May 1♂ JFL; *Valle del Cauca*: Queremal Jul. 1♂ LMC. **ECUADOR** (4♂, 3♀): *Carchi*: Lita, ridge east of Río Baboso 900m Jul. Aug. 2♂ KWJH; *Imbabura*: Cachaco 1300m Jul. 1♂ KWJH; *Manabí*: Cerro Pata de Pájaro, nr. Pedernales 750m Aug. 1♀ KWJH; *Pichincha*: Tandapi 1550m Mar. Aug. 1♀ KWJH, 1♀ USNM; *Not located*: no specific locality 1♂ BMNH. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ ZMHU.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona; Soconusco; Sierra Madre (de la Maza & de la Maza, 1993). **COLOMBIA**: *Caldas*: Cerro Ingrumá 2300m Jul. Sep. Dec. (Salazar, 1996). **ECUADOR**: *Carchi*: Lita, ridge east of Río Baboso Sep.; *Pichincha*: Palmito Pamba 1550m Oct. (Willmott & Hall, sight records); Reserva Maquipucuna 1550-1600m Sep. (Raguso & Gloster, 1996).

Adelpha seriphia therasia Fruhstorfer, 1915

Figs. **41i,j**; *283*

Adelpha seriphia therasia Fruhstorfer (1915: 531)

TL: Bolivia. **Types**: **ZMHU**: **ST**?♀: "Coroico, ca. 2000m, Bolivia, (Yungas) 1895 (2-5) Garlepp//Syntype//SYNTYPE ♂ Adelpha seriphia therasia Fruhstorfer G. Lamas det. '87"; **ST**?♂: Río Songo (1200m), Bolivia (Yungas), 1896, Garlepp [both examined]

Identification, taxonomy and variation:

This subspecies is similar to *A. s. pione*, but may be distinguished by having the ventral submarginal series paler, broader, the spots in each cell more clearly divided by dark rays on the hindwing and extended to almost merge with the pale subapical marking on the forewing. The ventral surface is very similar to the Peruvian syntype specimen of *naryce*, placed as a synonym of *aquillia* in this work, which differs as in all *A. s. aquillia* in lacking the well developed postdiscal series of orange dashes on the DHW. I have seen only a few specimens of *A. s. therasia*, in some of which the inner and outer ventral submarginal series are almost completely merged.

Fruhstorfer (1915) provided no information on the sex, number, depository or exact locality of the type specimens of *therasia*, except that they were collected by Fassl in Bolivia. The description of *therasia* is also brief, stating only that the specimens differed from "Colombian forms" in being smaller with narrower white postdiscal bands. I am not certain that the ZMHU specimens (Fig. 41i,j) are indeed valid syntypes, as they appear to have been collected by Garlepp rather than Fassl, but I have no doubt that the taxon that Fruhstorfer described as *therasia* is indeed the same as that treated here.

Range: Southern Peru to northeastern Bolivia.

Habitat and adult ecology: There are no published observations on this subspecies, which, according to specimen label data, occurs from 1200-2150m. The only recorded month of collection is August, the transition from the dry to the wet season.

Specimens examined (4♂, 3♀):

PERU (1♂, 1♀): *Cuzco*: Marcapata 4500' 1♀ BMNH; Quebrada Morro Leguia, Cosñipata 2150m Aug. 1♂ MUSM. **BOLIVIA** (3♂, 2♀): *La Paz*: Coroico 1♀ ZMHU, 1♂ MCZ; Río Songo 1200m 1♂ ZMHU; Río Tanampaya 1♀ ZMHU; San Antonio, Yungas 1800m 1♂ ZMHU.

Adelpha seriphia egregia Röber, 1927 **stat. rest.**

Figs. **41k,l**; *283*

Adelpha egregia Röber (1927: 420, fig. 4)

TL: Sierra Nevada de Santa Marta, Colombia. **Types**: **BMNH**(T): **HT**♀: "Adelpha egregia Röber, Holotype ♀ (illustrated "Type") det. R.I. Vane-Wright 1983//Brit. Mus. 1928-151//B.M. TYPE No. Rh. 307 Adelpha egregia ♀ Röber//Adelpha egregia Röb. Type ♀//Sierra Nevada de Sta. Marta Columbien S. Am. 1500m Juni 1925 Coll. Dr. Krüger W. Niepelt Zirlau//TYPE//Type//Syntype"; **PT**♂: "Adelpha egregia Röber ♂ Paratype det. R.I. Vane-Wright 1983//Brit. Mus. 1928-151//B.M. TYPE No. Rh. 306 Adelpha egregia ♂ Röber//Adelpha egregia Röb. Type ♂//Sierra Nevada de Sta. Marta Columbien S. Am. 1500m Juni 1925 Coll. Dr. Krüger W. Niepelt Zirlau//Type//116//T.G.H. 1962 551" [both examined]

=*Adelpha serpa pione* G. & S., Hall (1938) (form); *Adelpha seriphia egregia* Röb., Willmott & Hall (1999)

Identification, taxonomy and variation:

As the name suggests, this subspecies cannot be mistaken for any other *Adelpha* taxon; it is the only taxon in the *A. serpa* group in which the dorsal white postdiscal band is absent.

Röber (1927) described this distinctive subspecies as a separate species based on two males in Niepelt's collection, one of which he figured and named the Type. This specimen, however, proves to be a female and is in the BMNH with the male paratype. Hall (1938) synonymised the name as a form of *A. s. pione*, which it clearly is not given the geographic isolation of the Sierra Nevada de Santa Marta and lack of variation observed in the small series examined. Willmott & Hall (1999) followed an unpublished checklist of G. Lamas in treating *egregia* as a subspecies of *A. seriphia*, since it possesses the diagnostic characters for this species, and differs substantially only in the absence of the white dorsal postdiscal band, a character that varies interspecifically throughout the genus. Salazar (2000) reinstated *egregia* as a distinct species, based on the "extremely insular and isolated character" of the Sierra Nevada, the lack of white dorsal postdiscal band and rarity of this subspecies in comparison with other *A. seriphia* taxa. However, a number of *Adelpha* species vary substantially in rarity throughout their range, and for the initial reasons stated above, I restore *egregia* to a subspecies (**stat. rest.**).

Range: Endemic to the Sierra Nevada de Santa Marta in northern Colombia.

Habitat and adult ecology: Nothing has been reported on the habitat and behaviour of this subspecies, which, judging from the number of specimens in collections, appears to be locally not uncommon. It has been recorded from 1500-2400m with the majority of records in the latter half of the year.

Specimens examined (3♂, 8♀):

COLOMBIA (3♂, 8♀): *El César*: Río Meoguachucua 1900m Aug. 1♀ BMNH; *Magdalena*: Minca 2400m Oct. 2♀ JFL; San Lorenzo Mines Dec. 1♀ ESM; E. above San Pedro de la Sierra, Sta. Marta, 2000m Aug. 1♂ BMNH; San Sebastián-El Mamón 2200m Mar. Sierra Nevada de Sta. Marta 1♀ MUSM; Sarachuí 1750m Jul. 1♂, 1♀ BMNH; above Vista Nieva 1600m Jun. 1♀ BMNH; *Not located*: Sierra Nevada de Santa Marta 1500m Jun. 1♂, 1♀ BMNH.

Adelpha seriphia barcanti Willmott, **ssp. nov.**

Figs. **41m,n**; *283*

Adelpha seriphia Fldr., Kaye (1940), Barcant (1970: 131, pl. 5, fig. 3)

Description and diagnosis: FW length of HT: 28.5mm. Male differs from that of *A. seriphia seriphia* in entirely lacking the orange subapical marking on the DFW in cells M_3-M_2, M_2-M_1 and M_1-R_5, with the result that the VFW subapical marking is white instead of pale orange, and in having slightly narrower dorsal postdiscal bands. The ventral submarginal markings are also slightly obscured by darker scaling, while the inner submarginal series on the VHW is almost parallel with the orange-brown postdiscal line due to the spots being more elongate and diffuse. Since, however, every other wing pattern character of this taxon is typical of the nominate subspecies, there is little doubt that the two are conspecific. I have not examined the female.

Types: ***Holotype*** ♂: TRINIDAD: *St. George*: El Tucuche summit, 3072 ft., 11 Aug. 1979 (M. J. W. Cock); in the BMNH(M). ***Paratype*** ♂: same data as holotype; in coll. M. J. W. Cock, Reading, England.

Etymology: This subspecies is named for Malcolm Barcant, who first figured this new subspecies in his field guide to Trinidadian butterflies (Barcant, 1970).

Taxonomy and variation: I have examined only two specimens of this subspecies, that figured by Barcant (1970), which was collected by R. Dick at the type locality in 1927 (now in the Angostura-Barcant collection in Trinidad – M. Cock, pers. comm.) and the holotype (Fig. 41m,n), and there is little variation. Both Kaye (1940) and Barcant (1970) simply refer to it as *Adelpha seriphia*.

Range: *Adelpha seriphia barcanti* is known only from the island of Trinidad, and has been collected only at the type locality, the summit of El Tucuche.

Habitat and adult ecology: Barcant (1970) reports that this subspecies could be regularly found on the summit of El Tucuche, perching in small groups, although Matthew Cock (pers. comm.) is of the opinion that he never captured any specimens. I am grateful to Matthew Cock for his comments on this subspecies, which I reproduce here: “In Trinidad, *A. seriphia* appears to be restricted to the one locality: the summit of El Tucuche (3, 072 ft.), a disturbed mountain top in primary forest. Between 1979 and 1982 I visited the summit of El Tucuche five times (once overnight), saw this species on two visits (several specimens on each occasion) and collected it once. At that time... the summit itself was reasonably clear... Trees growing just below the summit to the south and west overlooked the peak slightly, and the male of *A. seriphia* settled on these, only rarely coming within reach of a long-handled net. On one occasion I climbed the adjacent, slightly lower peak, El Naranja, but it was forested and collecting was not practical. Apart from my two males, as far as I am aware the only other Trinidad specimens known are those which Barcant refers to... and five males and a unique female in the collection of Scott Alston-Smith... Since climbing El Tucuche is normally a dawn to dusk trek... I would say with some confidence that all specimens were collected between 12.30 and 14.00”.

Specimens examined (2♂):
TRINIDAD (2♂): *St. George*: El Tucuche summit 3072 ft. Aug. 1♂ BMNH, 1♂ figured by Barcant (1970).

Adelpha hyas (Doyère, [1840])

Figs. **42**; 133; 217; *283*

Identification, taxonomy and variation:

Adelpha hyas is distinguished from other members of the *A. serpa* group by its small size, the lack of orange postdiscal dashes on the VFW in cells 2A-M_3 (occurring in *A. seriphia* and *A. serpa*), the dark, deeply intruding lines in the pale VFW subapical marking (also occurring in some subspecies of *A. seriphia*) and the pale base of the VFW costa (orange in *A. seriphia*). There is geographic variation in the colour of the ventral surface, arrangement of the DFW postdiscal band and ventral submarginal series, and three distinctive subspecies are recognised.

Adelpha hyas has rarely been accorded full species status, due to confusion surrounding the systematics of the *A. serpa* group in general. However, there are several characters that link its respective taxa, and it is clearly sympatric in several populations with *A. serpa*, whilst occurring at lower altitudes in the same areas as its probable closest relative, *A. seriphia* (see that species account).

Range and status: Eastern Ecuador along the base of the Andes to Bolivia, northern Argentina to southeastern Brazil. Probably extending into southern Colombia. Amazonian subspecies very local and rare, in wet rain forest in Andean foothills, southern subspecies locally common, from 100-1500m.

Specimens examined: 117 (62♂, 55♀)

Adelpha hyas hyas (Doyère, [1840])

Figs. **42a,b**; 217a-c; *283*

Heterochroa hyas Doyère ([1840]: pl. 138, fig. 1, 1bis)

TL: not stated. **Types**: **BMNH**?: **ST**♀?: [not located]

Adelpha hyas Boisd. [sic], Kirby (1871); *Adelpha serpa* form *hyas* Boisd. [sic], Fruhstorfer (1915); =*Adelpha serpa serpa* Boisd. [sic], Hall (1938); *Adelpha hyas* Boisd. [sic], Brown (1992)

Identification, taxonomy and variation:

Adelpha hyas hyas is a distinctive taxon, and is easily distinguished from other subspecies by the yellowish-brown (instead of reddish brown) bands basal to and distal of the white postdiscal band on the VHW. Other characters unique to *A. hyas hyas* are the bluish lines that fill the interior half of the area between the first and second discal cell bars and line the discocellulars on the VFW, the orange rather than red coloration at the base of cell 2A-Cu_2 on the VFW, and the configuration of the white postdiscal spots in cells Cu_2-Cu_1 and Cu_1-M_3 on the DFW, which have a straight, diagonal distal edge. There is slight individual variation in the width of the dorsal postdiscal bands and extent of the DFW orange subapical marking.

The author of the name *hyas* has been historically regarded as Boisduval, probably because Doyère ([1840]) credited the name to Boisduval in the original description. Nevertheless, since Doyère was the sole author on the work (Lamas *et al*., 1995), the name should be attributed to him. The original description contains no text to diagnose the species, but since both dorsal and ventral surfaces were accurately figured there is no doubt as to the taxon to which the name applies. Doyère provided no information on the origin of the specimen on which the illustration was based, nor did he indicate the sex, although the illustration suggests a female, and he stated that the specimens figured came from the collection of Boisduval. I have been unable to locate any potential type specimens in the BMNH, where the *Adelpha* from Boisduval’s collection reside, either in the main collection or the separately housed duplicates from Oberthür’s collection, where a syntype of *Adelpha serpa* Boisduval was recently discovered by Lamas (see under *A. serpa*). However, it is by no means certain that the type is lost and since there is no confusion surrounding the name, I deem a neotype designation unnecessary.

Adelpha hyas hyas has often been regarded as a form of *A. serpa* (Hall, 1938; Hayward, 1964, 1973), largely on the basis of supposed intermediate specimens, which actually belong to a third species, *A. radiata*. *Adelpha hyas hyas* is sympatric with *A. serpa serpa* throughout its range and I have seen no specimens intermediate between the two taxa, a fact noted by Hoffmann (1937a), who believed it to be a distinct species since he observed little to no variation in other Brazilian *Adelpha* and, despite rearing many *A. serpa serpa* from eggs, never found a specimen of *A. hyas*. Brown (1992) also accorded *A. hyas* specific status.

Range: Southeastern Brazil to northern Argentina and Uruguay, probably also Paraguay, though unreported from there to date.

Immature stages: Hoffmann (1937a) states that the egg is green.

Habitat and adult ecology: Biezanko (1949) reports that this taxon is rare in Rio Grande do Sul and flies in the months of April to June. Brown (1992) also reported it to be rare in the Serra do Japi, São Paulo, where it apparently can be encountered on hill tops near forest, and it occurs there in a variety of habitats, including gardens, areas with heavy secondary growth and even open fields. It is found typically above 1100m, though it may descend to 900m in valleys. Ebert (1969) found the species to be not uncommon to common in Minas Gerais in primary to secondary forest habitats. Specimen data indicate that elsewhere in its range it flies from near sea level to 1500m, from September to at least May.

Specimens examined (50♂, 50♀):
BRAZIL (49♂, 52♀): *Minas Gerais*: Passa Quatro Jan. 1♂ BMNH; *Paraná*: Castro Apr. 2♀ USNM, 3♂, 8♀ BMNH; Fernández Pinheiro 2600' Apr. 1♂, 1♀ AME, 2♂ BMNH; Ponta Grossa Sep. 2♂ AME; União da Vitória 2000' Dec. Jan. 2♂ BMB; no specific locality 1♂, 1♀ BMNH; *Rio de Janeiro*: Nova Friburgo 1♀ ZMHU; Petrópolis 1500m Jan. May 2♂ AME, 1♂ AMNH, 1♂

USNM; Rio 1♂ MCZ; Teresópolis 1♂, 2♀ BMNH; *Rio Grande do Sul*: Pelotas Feb. Apr. 3♂, 3♀ MCZ, 1♂, 4♀ AMNH, 1♀ AME, 3♀ USNM; Rio Grande Jan. 1♂, 3♀ BMNH, 1♀ MCZ; Santa Maria 1400' Jan. 1♂, 1♀ BMB; no specific locality 1♂ USNM; *Santa Catharina*: Blumenau 1♂ MCZ; Cauna 15♂, 11♀ AMNH; Joinville 100-200m Dec. 1♂ MUSM; Rio Vermelho 1♂ AMNH; São Bento do Sul 1750' Mar. 1♀ FSCA; Villa de Lages 2♂ BMNH; no specific locality 2♂, 6♀ AMNH, 3♀ ZMHU; *São Paulo*: São Paulo 1♂ BMNH; *Not located*: no specific locality 1♂, 1♀ BMNH. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ ZMHU.

Additional locality data: **BRAZIL**: *Minas Gerais*: nr. Poços de Caldas 1000-1400m Mar. May (Ebert, 1969); *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *Rio Grande do Sul*: Monte Bonito (Biezanko, 1949); *São Paulo*: Serra do Japi 1000m (Brown, 1992). **ARGENTINA**: *Misiones* (Hayward, 1951). **URUGUAY**: no specific locality (Biezanko *et al*., 1978).

Adelpha hyas viracocha Hall, 1938

Figs. **42c,d**; *283*

Adelpha serpa form *viracocha* Hall (1938: 285)

TL: Chanchamayo, Peru. **Types**: **BMNH**(M): **HT**♂: “Holotype//Perou Chanchamayo Oswald Schunke Reçu 1912//Ex Oberthür Coll. Brit. Mus. 1927-3//Holotype ♂ Adelpha serpa f. viracocha Hall G. Lamas det. 1987”; **PT**♂: “Bolivia Hewitson Coll. 79-69 Heterochroa hyas. 7.//B.M.(N.H.) Rhopalocera vial number 4412//Boliv.”; **PT**♀: “Bolivia Hewitson Coll. 79-69 Heterochroa hyas. 2.//Boliv.”; **BMB**: **PT**♂: Chanchamayo [all examined]

Adelpha serpa ? subsp. D’Abrera (1987); *Adelpha hyas viracocha* Hall, Willmott & Hall (1999)

Identification, taxonomy and variation:

Adelpha hyas viracocha is distinguished from the nominate subspecies under that account, and from *A. hyas hewitsoni* by the submarginal series on the ventral surface being merged with one another and almost blending with the postdiscal markings. It is similar to sympatric *A. seriphia aquillia*, but may be distinguished by the lack of a broad black band distal to the reddish postdiscal band on the VHW, the lack of any orange postdiscal dashes on the VFW in cells 2A-M$_3$ and by the base of the VFW costa being white instead of orange. *Adelpha serpa diadochus* has much more sharply defined submarginal markings on the ventral surface and no darker lines intruding into the pale VFW subapical marking. There is slight variation in the extent to which the ventral submarginal series are merged, in some specimens they are all but indistinguishable and the distal half of the wing takes on a uniform, pale brownish colour.

This taxon was described by Hall (1938) in comparison with *A. hyas hyas* and *A. radiata radiata*, and I have examined all of his designated type specimens (Fig. 42c,d). The characters that justify its placement as a subspecies of *A. hyas* are discussed under *A. hyas hewitsoni*.

Range: East Andean foothills from central Peru to Bolivia, possibly extending further north in Peru.

Habitat and adult ecology: There are no published observations of this subspecies in nature. It is clearly very rare and local, and restricted to forest along the base of the Andes up to 1050m.

Specimens examined (5♂, 3♀):

PERU (3♂, 1♀): *Junín*: Chanchamayo 1♂ BMNH, 1♂ BMB; *Puno*: Río Távara 1050m Aug. 1♂, 1♀(*in copulo*) MUSM. **BOLIVIA** (2♂, 2♀): *La Paz*: La Paz 1♀ MNHN; Río Songo 1♂ ZMHU; *Not located*: no specific locality 1♂, 1♀ BMNH.

Adelpha hyas hewitsoni Willmott & Hall, 1999

Figs. **42e,f**; 133; *283*

Adelpha hyas hewitsoni Willmott & Hall (1999: 12, fig. 8a,b, 18)

TL: Pimpilala, nr. Talag, Napo Province, Ecuador. **Types** (all Ecuador): **KWJH**: **HT**♂ & 4**PT**♂: Pimpilala; **AT**♀: Apuya; **PT**♂: Río Llandia; **MECN**: **PT**♂: Pimpilala [all examined]

Identification, taxonomy and variation:

Adelpha hyas hewitsoni is distinguished from the remaining two *A. hyas* subspecies by the small, sharply defined spots that compose the ventral submarginal series, which are themselves distinct and clearly separate from the postdiscal markings. There is slight local variation in the extent of the DFW orange subapical marking, which may extend into cell Cu$_1$-M$_3$.

Adelpha hyas hewitsoni was clearly described and figured in the original description, and the type series has been examined. Willmott & Hall (1999) placed the taxon with *A. hyas viracocha* as subspecies of *A. hyas* on the basis of the following shared characters: small size, lack of dark orange outer postdiscal series dashes on the VFW in cells 2A-M$_3$, VHW postdiscal band and inner submarginal series parallel, base of the VFW costa white rather than red-orange, and deeply intruding dark lines into the pale VFW subapical marking. *Adelpha hyas viracocha* additionally shares the following character with *A. hyas hyas*: the merging of the VFW submarginal series with the subapical marking to form a pale area that fills the distal half of the wing and ends basally along a straight, diagonal line extending from tornus to costa between the subapical marking and upper postdiscal band.

Range: To date this subspecies is known only from a small area in central eastern Ecuador. Presumably it is much more widespread, probably extending at least to southern Colombia and northern Peru.

Habitat and adult ecology: *Adelpha hyas hewitsoni* has been recorded at three localities at the base of the Andes, from 600-950m. It is sympatric with *A. paraena paraena*, *A. radiata explicator* and *A. serpa diadochus*, while *A. seriphia aquillia* also occurs in the east Ecuadorian Andes, but at higher elevations (1600-1800m). Males of *A. hyas hewitsoni* are typically encountered in groups in large (20-30m wide), old forest clearings along streams and rivers. Usually they perch from 1200-1330h in bright sun on the tops of bushes 5-6m high, making sorties out and returning to the same perch. At the type locality, Pimpilala, the species seems to be present throughout the year in a particular coffee orchard, where it is often the most common perching *Adelpha*. Other species that resemble it on the dorsal surface and with which *A. hyas* perches include *Adelpha iphicleola thessalita*, *Adelpha thoasa manilia* and *Adelpha serpa diadochus*. The single known female was flying in heavily disturbed ridge top forest around midday, at a site where males have yet to be recorded.

Specimens examined (7♂, 2♀):

ECUADOR (7♂, 2♀): *Napo*: Apuya 600m Sep. 1♀ KWJH; Pimpilala 600m Apr. Aug.-Oct. 5♂ KWJH; Talag Sep. 1♂ DAT; *Pastaza*: Río Llandia 950m Sep. Oct. 1♂ KWJH, 1♀ GWB.

Adelpha alala (Hewitson 1847)

Figs. **43**; 134; 218; *284*

Identification, taxonomy and variation:

Adelpha alala is distinguished from *A. corcyra* and *A. aricia* by the more rounded hindwing tornus and by having two clearly marked, oval or round white postdiscal spots at the DFW costal margin, instead of diffuse white shading. The clunicula of the male genitalia is shorter than *A. aricia*, but longer and more pointed than in *A. corcyra*. There is some variation in the presence or absence of an orange postdiscal band on the DHW, and three subspecies are recognised.

Adelpha alala is closely related to *A. aricia* and *A. corcyra*, sharing almost full expression of all postdiscal and submarginal series on the ventral surface, a distinct, entirely red-brown margin on the VFW and VHW, overall pale ventral coloration, especially in the basal area of the VHW, and similar genitalia, with the costal lobes of the male genitalic valvae reduced or absent, and the valvae bearing only a single, or few, large, terminal spines.

Range and status: Western slopes of the Andes from northwestern Venezuela (Cordilleras de la Costa, Mérida and Sierra de Perijá) to northwestern Ecuador, Sierra Nevada de Santa Marta, and eastern Andes from Colombia to northern Argentina. From 450m at the foot of the mountains to 2600m in a wide variety of habitats. Very common.

Specimens examined: 875 (859♂, 16♀)

Adelpha alala alala (Hewitson 1847)

Figs. **43a,b**; *284*

Heterochroa alala Hewitson (1847: 261, Pl. XXI, fig. 8)

TL: Venezuela. **Types**: **BMNH**(T): **ST**♂: “Illustrated in The Butterflies of Venezuela A. Neild, 1996//B.M. TYPE No. Rh. 9807 Heterochroa alala Hew.//Venezuela//Type//Syntype”; **BMNH**(M): **ST**?♂: “Hewitson Coll. 79-69 Heterochroa alala.1.” [both examined]

Adelpha alala Hew., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. alala completa* by lacking or having only a faint trace of orange postdiscal dashes on the DHW, and from both other subspecies by having the orange DFW subapical markings filling each cell to form a solid band, instead of being isolated spots in each cell.

Hewitson (1847) described this species from an unspecified number of specimens in his own collection and the British Museum, and two syntypes have been located in the BMNH (Fig. 43a,b). The original description, which mentions the white postdiscal spots at the costa of the DFW, and figure of the dorsal surface of the right hand pair of wings, which show the enlarged orange DFW postdiscal spots, clearly refer to this taxon. Two of the three specimens that I have examined from the Sierra Nevada de Santa Marta in Colombia differ from Venezuelan specimens in having the DFW orange subapical band extending distal of the white postdiscal band almost to the anal margin, while in the remaining specimen it doesn’t quite extend into cell 2A-Cu$_2$. In view of the isolation of the Sierra Nevada de Santa Marta from the Venezuelan Cordillera de la Costa, the presence of a different subspecies, *A. alala completa*, in intervening mountain ranges, and the slight wing pattern differences mentioned, the Colombian population may well merit separate subspecific recognition when more specimens are available to assess variation. In addition, I have seen no specimens from the Sierra de Perijá on the Colombia-Venezuela border, which might help to clarify the situation.

Range: Typical *A. alala alala* occurs in the Cordillera de la Costa of northwestern Venezuela, while phenotypically similar specimens are found in the Sierra Nevada de Santa Marta in northern Colombia.

Habitat and adult ecology: The nominate subspecies is relatively uncommon in collections and nothing has been reported on its behaviour in the field. It is probably involved in mimicry with the sympatric *A. seriphia seriphia*.

Specimens examined (17♂, 7♀):

VENEZUELA (16♂, 5♀): *Aragua*: La Lagunita de la Montaña, S.W. Colonia Tovar 1750m Oct. 4♂ BMNH; *Distrito Federal*: Avila 1000m Jul. 1♂ AFEN; Caracas 8000' Feb. 1♂, 1♀ AME, 2♂, 1♀ BMB; S. slope of Mt. Avila 6510-7000' 1♂ USNM; *Not located*: no specific locality 3♂, 3♀ BMNH, 3♂ AMNH, 1♂ BMB. **COLOMBIA** (1♂, 2♀): *Magdalena*: “Sarachuí 1750metres 18.VII.1972//North Colombia: 1725 Sierra Nevada de Sta. Marta Exped. M.J. Adams & G.I. Bernard//61.71/72 A/B/B.M. 1973-106” 1♂ BMNH(A&B); “Sarachuí 1830 1750metres 17.VII.1972//B.M. 1973-106” 1♀ BMNH(A&B); *El César*: “Maruámaque-Chenduca 1450-1750m 15.VII.972//North Colombia: 1697 Sierra Nevada de Sta. Marta Exped. M.J. Adams & G.I. Bernard//B.M. 1973-106” 1♀ BMNH(A&B). **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Adelpha alala negra (C. & R. Felder, 1862)

Figs. 2p; **43c-f**; 134a,b; 218a,b; *284*

Heterochroa alala var. *negra* C. & R. Felder (1862: 115)

TL: [“fluminis Negro superioris in Brasilia septentrionali”]-erroneous. **Types**: **BMNH**(R): **ST**♂: “Syntype//Río Negro//v. negra Feld.//negra n.”; **ST**?♂: “Río Negro//f. negra Feld.” [both examined]

=*Adelpha ehrhardi* Neuburger (1907: 50) **syn. nov.**

TL: Santa Inéz, Ecuador. **Types**: **Wilhelm Neuburger collection** (current location unknown): **HT**: [not examined]

=*Adelpha alala albifida* Fruhstorfer (1907: 172) **syn. nov.**

TL: “Unknown, probably Central America or Colombia”. **Types**: **BMNH**(T): **ST**♂: “cora fa. albifida Fruhst.//H. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype” [examined]

=*Adelpha alala cora* Fruhstorfer (1907: 172) **syn. nov.**

TL: Pozuzo, Peru. **Types**: **BMNH**(T): **ST**♂: “alala cora Fruhst.//Peru H. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype” [examined]

=*Adelpha alala fillo* Fruhstorfer (1907: 172) **syn. nov.**

TL: “Argentina, Bolivia??”. **Types**: **BMNH**(T): **ST**♂: “fillo Fruhst.//Argentinien ex coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype” [examined]

=*Adelpha negrina* Fruhstorfer (1913: pl. 108a; 1915: 515) **syn. nov.**

TL: [Bolivia]. **Types**: **BMNH**(T): **ST**♂: “alala negrina Fruhst.//Yungas Bolivia//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype”; **BMNH**(R): **ST**♂: “negrina//Guanay Mapiri R. 1500' 8 95 Stuart//alala negrina Fruhst.//R//108 A3” [both examined]

=*Adelpha alala privigna* Fruhstorfer (1915: 515) **syn. nov.**

TL: “presumably Peru or the Upper Amazon”. **Types**: **BMNH**(T): **ST**♂: “cora fa. privigna Fruhst.//Peru H. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype”; **BMNH**(M): **ST**?♂: “privigna Fruhst.//Peru H. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131”[both examined]

=*Adelpha alala completa* form *praecaria* Fruhstorfer (1915: 515) unavailable name

TL: not given. **Types**: **BMNH**(T): **ST**♂: “completa fa. praecaria Fruhst.//Columbien ex coll. H. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype”; **BMNH**(R): **ST**♂: “R. Dagua Colombia W. Rosenberg//completa fa. praecaria Fruhst.//R//completa” [both examined]

Adelpha alala var. *negra* Fldr., Kirby (1871)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. a. completa* by lacking the orange postdiscal band on the DHW, and from the nominate subspecies by the smaller orange DFW subapical spots, which are isolated in each cell space. It is a rather variable subspecies and a number of phenotypes have been described, particularly by Fruhstorfer (1907, 1913, 1915). The DFW orange subapical spots vary in size and may in some specimens, particularly in northern Peru (Tabaconas) and southern Ecuador, be entirely white (a plesiomorphic state), the dorsal postdiscal bands vary in thickness, and specimens from central to southern Peru frequently have the orange DFW subapical spots continued as a postdiscal band to the anal margin of the forewing (Fig. 43e). The ventral surface varies from being striped with rich reddish and yellowish brown bands to a washed out silvery grey, the brown colours almost absent (Fig. 43f,h). After an examination of a large series I conclude that all of these characters are locally variable and do not define geographic populations worthy of subspecific recognition. However, data for most Peruvian specimens that I have examined are vague and it may be that further collecting in isolated cordilleras will reveal the presence of phenotypically stable populations. It is very possible that the variable possession of the entire orange postdiscal band on the DFW is due to local mimicry with *A. aricia*, which has an entire DFW band throughout central Peru and Bolivia.

The Felder brothers introduced the name *negra* as a variety of *A. alala*, stating that it differed from the Venezuelan form in having a wider postdiscal band and less undulate submarginal brown lines, presumably referring to the DHW. The type specimen(s) supposedly originated from the Upper Río Negro in Brazil (Felder & Felder, 1862), but it is clear from other species described in the same paper that the specimens actually originated in the Río Huallaga valley above Yurimaguas, in northern Peru (Lamas, 1976). I have examined a syntype male and a further possible syntype male in the BMNH(R). Subsequently, Neuburger (1907) described specimens of *A. alala* from Ecuador (Santa Inéz), Venezuela (Mérida) and Bolivia as a new species, *A. ehrhardi*, which he stated differed from the nominate in lacking the orange DHW submarginal markings. He also stated that he considered the Ecuadorian specimen to represent the typical form, and I therefore regard this specimen as the holotype and the type locality as Ecuador. Although no syntypes have been located of this taxon, since no mention was made of *A. alala negra* and Ecuadorian specimens are otherwise typical of this subspecies, I synonymise *ehrhardi* with *negra* (**syn. nov.**). Fruhstorfer (1907, 1913, 1915) described six new taxa based on what I consider to be infrasubspecific variation in width of the dorsal postdiscal band, colour of DFW subapical spots and colour of the ventral surface. Hall (1938) synonymised *praecaria* with *negra* and retained two of the remaining taxa (*cora* and *fillo*) as subspecies, with due scepticism, relegating the remainder to the status of forms of these subspecies. The name *A. alala albifida* was applied to an unknown number of specimens lacking locality data and the syntype male in the BMNH corresponds well with the description (Fruhstorfer, 1907), having a broad dorsal postdiscal band and white DFW subapical spots. *Adelpha alala cora* was based on two males from Pozuzo in Fruhstorfer's collection in which the orange DFW subapical markings extend to the anal margin (Fruhstorfer, 1907), and although the single putative syntype in the BMNH bears only the data "Peru", it agrees well with the original description (Fig. 43e,f). *Adelpha alala fillo* was described for an unknown number of specimens which Fruhstorfer (1907) received from Buenos Aires and suggested originated in Argentina or Bolivia; a syntype male is in the BMNH and differs little from typical *A. alala negra*. Fruhstorfer's (1915) description of *A. alala negrina*, from Bolivia, is almost negligible, although the figure (Fruhstorfer, 1913) and two syntype males in the BMNH show it to scarcely differ from typical *A. alala negra*. The taxon *privigna* was described based on specimen(s) which differed from *albifida* only in having narrower dorsal postdiscal bands (Fruhstorfer, 1915), and I have examined two potential syntype males in the BMNH which correspond well with this description. I synonymise all of the preceding five taxa (*albifida*, *cora*, *fillo*, *negrina* and *privigna*) with *A. alala negra* (**syn. nov.**). Finally, the form *praecaria* was described for Colombian specimen(s) differing from *A. alala completa* in lacking the DHW orange submarginal band (Fruhstorfer, 1915); the original figure (Fruhstorfer, 1913: pl. 108, a, as *completa*) and syntype males in the BMNH (Fig. 43c,d) show it to be a synonym of *A. alala negra*, as Hall (1938) concluded, and the name is in any case unavailable, being a quadrinomial.

Range: Colombia, in the Cordillera Oriental south of Bogotá, to northwestern Ecuador west of the Andes, to northern Argentina on the east Andean slopes. The subspecies also occurs on the west Andean slopes in extreme south Ecuador, possibly through dispersal from the southeastern slopes, since the species is unknown from the central west Ecuadorian Andes.

Habitat and adult ecology: Males of *A. alala negra* are very common in a wide variety of montane habitats up to 2600m, and may even be found in wet lowland forest as low as 400m near the base of the Andes. Typically they are found in the vicinity of forested mountain rivers and are often observed congregating in very large numbers to feed at moist sand or on water seepage over rocks, particularly when these areas are enriched with urine. They are also attracted to rotting fish and dung on the ground or in traps, and very occasionally may feed on flowers. Males perch on secondary growth bushes from 4-8m above the ground along the edges of rivers, on the tips of leaves with their wings almost closed. Salazar (1996) also reported males hill topping on Cerro Ingrumá in Colombia, at 2300m. Females of this subspecies are very rare in collections and nothing is known of their behaviour. The species seems to fly throughout the year.

In Peru and Bolivia this subspecies is sympatric and probably involved in mimicry with *A. aricia*, which inhabits similar montane habitats. Both of these species have local forms with orange postdiscal bands on the DFW throughout southern Peru and Bolivia.

Specimens examined (691♂, 5♀): † - trans. to *A. a. completa*. "**VENEZUELA**" (3♂): *Distrito Federal*: Avila Dec. 1♂ JFL-error; *Not located*: no specific locality 1♂ USNM, 1♂ MCZ-error?. **COLOMBIA** (167♂, 2♀): *Antioquia*: Frontino 1♂ BMNH; Mesopotamia 8♂ AMNH; Río Cocorná Aug. 2♂ AMNH; Salinas 4-8000' Jul. 6♂, 1♀ BMB; *Boyacá*: Muzo 12♂ AME, 1♂ BMB; *Caldas*: Aguacatal Riosucio Jul. 1♂ KWJH; Bocatoma 2400m Aug. 1♂ USNM; El Aguila Manizales 1800m Oct. 1♂ KWJH; Manizales Feb. Sep. 5♂ BMNH, 2♂ MUSM; Quebrada El Bohio, Manizales 1750m Nov. 1♂ MHNUC; *Caquetá*: Caquetá Jun. 4♂ JFL; *Cauca*: Popayán 1♂ BMB; *Cundinamarca*: Bogotá 12♂ BMNH, 2♂ USNM, 2♂ BMB; env. de Bogotá 12♂ BMNH; Bogotá-Pandi Dec. 1♂ BMNH; Guayabetal Jul. 1♂ JFL; Honda 5♂ BMNH; La Vega Jul. 1♂† JFL; Susumuco 2♂ BMNH; *Meta*: Peperital-Buenavista 2♂ BMNH; Río Negro May 1♂ ESM; Villavicencio 10♂ AMNH; *Nariño*: El Palmar 2♂ AMNH; *Quindío*: Cerro Aguacatal May 1♂ JFL; *Risaralda*: Quebrada Río Negro, Pblo. Rico 1550m Aug. 1♂ MHNUC; *Tolima*: Las Guayabas, Río Cucuana 1500m Mar. 10♂ AME; Río Ambeima 1400m Feb. 1♂ AME; *Valle del Cauca*: Bitaco 1700m Jan. 1♂ FSCA; Cali Aug. 2♂ BMNH, 1♂ MUSM; Calima Dam 3000' Jan. Feb. Nov. 1♂ FSCA, 3♂ AME; Cerro Gorda 2350m 1♂ AME; El Saladito, km 12 via mar Aug. 1♂ LMC; Jiménez 1600' Mar. 1♂ BMNH; Juntas 4♂ BMNH; Lago Calima Jul. 1♂ ESM; San Antonio 2000m Aug. 1♂ LMC; Pance 4000' Sep. 1♂ LMC, 1♂ FSCA; Peñas Blancas 1800m Jan. Dec. 1♂ FSCA, 1♂ LMC; Pichinde 1♂ BMNH; Pico de Aguila 1500m Jan. Jun. 3♂ FSCA, 1♂ LMC; Río Dagua 4♂ BMNH, 1♂ ZMHU; *Not located*: Caucathal 1♂, 1♀ ZMHU; no specific locality 19♂ AMNH, 2♂ BMNH, 3♂ ZMHU, 2♂ USNM, 7♂ MNHN. **ECUADOR** (172♂, 2♀): *Carchi*: Lita 3000' 3♂ BMNH; Santa Rosa, Río Golondrinas 1700m Sep. 2♂ KWJH; *Esmeraldas*: Esmeraldas 2♂ BMNH; *Loja*: Loja Dec. 4♂ BMNH, 1♂ BMB; *Imbabura*: Paramba 3500' Mar.-May 15♂ BMNH; *Morona-Santiago*: Río Abanico Oct. Nov. 3♂ MJP, 1♂ DAT; *Napo*: Cotundo 800m Oct. 1♂ USNM; El Capricho Oct. 1♂ DAT; Finca San Carlo Apr. Sep. 2♂ KWJH; Latas 460m Feb. 1♂ AME; Misahuallí 650m Mar. 1♂ MUSM; Río Arajuno 700m Mar. 1♂ AME; Río Chalayacu Sep. 1♂ DAT; "Río Coca" Jul. 2♂ AME-error; Río Hollín Nov. 1♂ DAT; Río Napo 1♂ MNHN; Satzayacu Sep. Nov. 3♂ AME, 1♂ DAT; *Pastaza*: Alpayacu 3600' 3♂ BMNH; Mera Jun. 1♂ DAT; Puyo Jun. 1♂ DAT; Puyo, 20 km N.W., Nov. 1♂ AMNH; Puyo-Tena rd. km 9, Oct. 2♂ MJP; Shell Oct. 1♂ KWJH; *Tungurahua*: env. de Ambato 7♂ BMNH, 3♂ BMB; Baños Jun. Oct. 1♂ MJP, 1♂ DAT, 1♂ BMNH, 1♂ BMB; El Rosario 4900' 2♂ BMNH; La Mascota 1200m Aug. 5♂, 1♀ AME; La Victoria 3500' 1♂ BMNH; Mirador 1♂ AMNH; Palmera 1♂ AMNH; Río Blanco Apr. Aug. 3♂ AME; Río Chinchin Grande 1400m Dec. 6♂ AME; Río Mapoto Dec. 1♂ AMNH; Río Negro Apr. Jul. Dec. 2♂, 1♀ AME; Río Tigre 1200m Aug. 13♂ AME; Río Topo 15-1700m Jan. Jun. Aug.-Oct. 4♂ MJP, 1♂ BMNH, 12♂ USNM; Río Verde 5000' Jan. Jul. 1♂ BMNH, 1♂ AME; Río Zuñac 1300m Jul. 3♂ KWJH; Topo Mar. Dec. 3♂ AME; *Zamora-Chinchipe*: Río Numbala 1♂ BMB; north of Valladolid 2000m May 1♂ KWJH; Zamora 3-4000' 19♂ BMNH; Zumba Jul. 2♂ BMB; *Not located*: middle Ecuador 3♂ AMNH; Oriente 3♂ AMNH; Solacama 1♂ BMNH; no specific locality 7♂ AMNH, 4♂ BMNH, 1♂ USNM, 2♂ BMB. **PERU** (232♂, 1♀): *Amazonas*: Chachapoyas 3♂ BMNH; Cord. del Condor 10-1200m Jul. 2♂ MUSM; Huambo Oct. 2♂ MUSM; Mendoza, 14 km W., 1800m Mar. 1♂ MUSM; *Ayacucho*: Candalosa 1300m Jun. 1♂ AME; Río Piene 11♂ AMNH; *Cajamarca*: Charape 4000' Sep.-Oct. 3♂ BMNH; La Balsa-El Chaupe 1650-1850m Jun. 1♂ MUSM; Río Chinchipe 6000' 2♂ BMNH; Río Tabaconas 6000' 3♂ BMNH; *Cuzco*: Buenos Aires, Cosñipata 2-2300m Dec. 8♂ MUSM; Callanga 1500m 1♂ ZMHU; Caradoc 4000' Feb. 4♂ BMNH; Cosñipata 2♂ BMNH; Cuzco 4♂ MNHN; Machu Picchu Sep. 1♂ MUSM; Marcapata 4500'

4♂ BMNH; Quebrada Morro Leguia 2150m Aug. 6♂ USNM; Quebrada Quitacalzón, Cosñipata 1050m May 1♂ MUSM; Río Pampaconas Aug. 1♂ USNM; Santa Ana 1♂ BMNH; Santa Isabel, Cosñipata Feb. Jun. 3♂ MUSM; Yanamayo, Cosñipata 2000m Feb. 3♂ MUSM; *Huánuco*: Carpish Acomayo Sep. 1♂ BMB; Cushi 1820m 1♂ BMNH; Las Palmas 450m Aug. 1♂ AME; Tingo María Mar. Apr.-Aug. 1♂ FSCA, 11♂ AME, 1♂ USNM, 3♂ MUSM; no specific locality 1400m Apr. 1♂ USNM; *Junín*: Chanchamayo Jun. Jul. 25♂ BMNH, 2♂ ZMHU, 2♂ AME, 1♂ USNM, 2♂ BMB, 1♂ MCZ; Hda. Naranjal, Mina Pichita 1550m Oct. 1♂ MUSM; La Merced 2500' Mar. Aug.-Nov. 5♂, 1♀ BMNH, 7♂ BMB, 2♂ MUSM; Río Colorado 1♂ BMNH, 1♂ MCZ; Río Perené Mar. 1♂ BMNH, 1♂ BMB; Río Tulumayo, nr. Vitoc 1200m May 1♂ MUSM; San Ramón 2♂ MUSM; Utcuyacu 5000' Dec.-Jan. 1♂ BMNH; "*Lima*": env. Lima 1♂ MNHN-error; *Loreto*: "Iquitos" 1♂ AMNH-error; "Río Negro" [=Río Huallaga] 2♂ BMNH; *Madre de Dios*: Madre de Dios 1♂ MCZ; *Pasco*: Alto Yurinaqui, Eneñas 1400m Apr. 1♂ MUSM; Huagaruncho, nr. Cerro Pasco 1♂ BMNH; Huancabamba 1♂ BMNH; Oxapampa May 2100m 2♂ MUSM; Pozuzo 800-1000m 12♂ BMNH, 1♂ BMB, 1♂ MUSM; *Puno*: Carabaya May 4♂ BMNH, 2♂ AMNH; Inca Mines Oct. 1♂ AMNH; Oroya 3-3500' Apr. Nov. 7♂ BMNH; Río Inambari to Limbani Mar. 1♂ BMNH; Sto. Domingo 4500' 4♂ BMNH; Uruhuasi 7000' Apr. May 2♂ BMNH; *San Martín*: Huayabamba 3500' 6♂ BMNH, 1♂ ZMHU; Jepelacio 1100m Jan. May 1♂ BMNH, 1♂ AME, 1♂ AMNH; Juanjuí 1♂ MUSM; Rioja Jun. 1♂ AME; Venceremos 1500m Dec. 3♂ MUSM; *Not located*: Opara 1600m 1♂ AME; Río Huallaga 5♂ AMNH, 2♂ USNM; no specific locality 10♂ BMNH, 1♂ USNM, 3♂ BMB, 3♂ MNHN, 1♂ MUSM, 1♂ MCZ, 1♂ JFL. **BOLIVIA** (79♂): *Cochabamba*: Charapaya 1300m Apr. 3♂ BMNH; Cochabamba 9♂ BMNH, 1♂ BMB; Incachaca 2220m Apr. 4♂ AME; San Jacinto 6-8000' 1♂ BMNH, 1♂ ZMHU; *La Paz*: Chaco 2-3000m 1♂ ZMHU; Chulumani 5200' May Dec. 3♂ BMNH, 1♂ FSCA, 1♂ MCZ; Coroico 1♂ ZMHU, 1♂ AME; Guanay 1♂ BMNH; La Paz 1♂ BMNH, 3♂ MNHN; La Paz-Coroico rd. 2000m Sep. 1♂ KWJH; 20 mi. above Mapiri 4000' 2♂ BMNH; Puenta Villa May 3♂ FSCA; Río Puni 900-1400m Dec. 1♂ AME; Río Songo 1600m Apr. 1♂ MUSM, 1♂ ZMHU; Río Suapi 1♂ ZMHU; Río Unduavi 2000m Feb. 1♂ BMNH; San Augustín Sep. 1♂ BMNH; Yolosa 1200m Sep. 1♂ KWJH; Yungas 1200m Nov. 3♂ BMNH; *Potosí*: Tupiza 1♂ AME; *Santa Cruz*: Bueyes 2♂ BMNH, 1♂ ZMHU; Río Negro 1♂ AME; *Not located*: Okara Apr. 1♂ AMNH; Pitiguaya May 11♂ AMNH; no specific locality Aug. 6♂ BMNH, 5♂ AMNH, 1♂ BMB, 2♂ MCZ. **ARGENTINA** (3♂): *Salta*: Río Arrayazal 600m Sep. 2♂ AME; *Not located*: no specific locality 1♂ BMNH. "**BRAZIL**" (2♂): *Paraná*: no specific locality 2♂ AMNH-error. **COUNTRY UNKNOWN** (33♂): U. Amazon 1♂ BMNH; no specific locality 4♂ BMNH, 1♂ AME, 7♂ USNM, 6♂ BMB, 1♂ MNHN, 12♂ MCZ, 1♂ AMNH.

Additional locality data: **COLOMBIA**: *Caldas*: Cerro Ingrumá 2300m Jul. Sep. Dec. (Salazar, 1996). **ECUADOR**: *Carchi*: Las Juntas Nov.; Nariz del Diablo Nov.; Santa Rosa Sep. Nov.; *Imbabura*: Cachaco 1300m Jul.; *Loja*: Cerro Villonaco, Loja-Catamayo rd. 2200m May; Qbda. del Batén, nr. Guayquichuma 1050m May;*Morona-Santiago*: Limón-Gualaceo rd., km 14, Sep.; Río Abanico Dec.; *Napo*: Finca San Carlo Aug.; Pimpilala 600m Aug. Sep.; Tena-Loreto rd., km 49, Aug. Oct.; *Pastaza*: Puyo-Tena rd., km 35, Oct.; Río Llandia Aug. Dec.; Río Puyo Oct.; Shell Feb. Apr.; *Sucumbíos*: La Bonita-Rosa Florida rd., km 15, Mar.; Quebrada El Copal Nov.; Quebrada El Garrapatal Nov.; Río Palmar Nov.; Río Sucio Nov.; *Tungurahua*: Chinchin Oct.; Río Zuñac Oct.; Río Machay Feb. Apr. Aug. Nov.; *Zamora-Chinchipe*: Chachacoma Nov.; Chinapintza Sep.; Quebrada Chorillos Apr. Nov.; Quebrada Las Dantas Oct.; Quebrada San Ramón Oct.; Zumba-Loja rd., km 35, Jul. (Willmott & Hall, sight records). **ARGENTINA**: *Misiones* (Hayward, 1951)-error?, presumably *Salta*.

Adelpha alala completa Fruhstorfer, 1907 **stat. rest.**

Figs. 2k; **43g,h**; *284*

Adelpha alala completa Fruhstorfer (1907: 172)

TL: Muzo, Colombia. **Types**: **BMNH**(T): **HT**♂: "alala completa Fruhst.//Columbien Rochld[?] H. Stichel//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype" [examined]

=*Adelpha alala* form *titia* Fruhstorfer (1915: 515) **syn. nov.**

TL: Venezuela. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//33//alala titia Fruhst.//Mérida Venezuela 1630m//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype"; **BMNH**(M): 2**ST**?♂: "Fruhstorfer Coll. B.M. 1933-131//Venezuela ex Coll. H. Fruhstorfer" [all examined]

Adelpha alala var., Staudinger (1886); =*Adelpha alala negra* Fldr., Hall (1938); *Adelpha alala* Hew., D'Abrera (1987); *Adelpha alala titia* Fruhst., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished by having a postdiscal line of orange dashes on the DHW distal of the white postdiscal band. Although there is some variation in the intensity of the dashes, after examination of a large series I believe that this subspecies should be maintained. Hall (1938) synonymised *completa* as a form of *A. alala negra*, as he believed that the two phenotypes were sympatric. However, an analysis of more accurate locality data than Hall had available suggests that *completa* is not a local form but occupies a defined geographic area, and so I reinstate it as a good subspecies (**stat. rest.**). As in *A. alala negra*, there is variation in the width of the white postdiscal bands on both wings and size of the DFW subapical spots, but no variation that appears to be geographically correlated. Specimens from the Bogotá area show intergradation to *A. alala negra* through loss of the orange DHW dashes.

Fruhstorfer (1907) described *A. alala completa* from a single male specimen, collected by H. Stichel in 1896 in Colombia, which he stated differed from *A. alala alala* on the dorsal surface in having a narrower orange postdiscal band and broader white postdiscal band on both wings. The holotype is in the BMNH (Fig. 43g,h). Neither of these differences constitute anything more than individual variation, and it is unclear why he failed to mention the diagnostic orange DHW postdiscal markings which are lacking in the nominate subspecies. Fruhstorfer (1915) subsequently described the form *titia* from Venezuela, without specifying number, sex, location or accurate locality of type specimens, as differing from the nominate in having a narrower white dorsal postdiscal band. Again, his description and discussion are so brief as to be almost worthless, he fails to comment on the DHW postdiscal orange bands, and there is no mention of why he believed his form *titia* to be distinct from *completa*. I have examined a single syntype and two potential syntype males of *titia* in the BMNH and they do not differ from typical *completa*. Neild (1996) referred to Venezuelan specimens, treated here as *A. alala completa*, as *A. alala titia*, without reference to the former name. Since I can find no consistent differences between Venezuelan and Colombian *A. alala completa* I place *titia* as a junior synonym of *completa* (**syn. nov.**).

Range: Both Andean slopes from northwestern Venezuela (Cordillera de Mérida) to north Colombia (Cordillera Oriental), as far south as Bogotá.

Immature stages: The only recorded hostplant is *Viburnum tinoides* var. *venezuelense* (Caprifoliaceae), a shrub or small tree commonly known in Venezuela as "Cabo de Hacha", which grows in areas of secondary growth and along forest margins (Otero & Aiello, 1996).

Otero & Aiello (1996) describe the early stages, illustrating the last instar and pupa, and their observations are summarised here. The egg is laid singly on the underside of a leaf and is similar in morphology to other *Adelpha*, as is the first instar larva. The second to fourth instar has a wide, dorsal greenish yellow stripe divided by a thin median line, and a lateral maroon stripe bordered ventrally by a white subspiracular line. The fifth instar is a more uniform green and, similar to *A. tracta* (pers. obs.) and *A. donysa* (A. Muyshondt, pers. comm.), differs greatly in appearance from all other known *Adelpha* species groups in having very reduced scoli, with true scoli only on segments T2, T3 and A8, with those on the latter two segments being minute. The T2 scoli are orange with a single central black spine and five radiating spines at the apex. The pupa is bone white to straw coloured, and simple in form, lacking obvious dorsal projections on T2 and A2. The head horns are triangular and squat. The construction of perches from leaf veins by the larvae is a behaviour similar to that of other *Adelpha* (see generic introduction), while the late first instar and second instar go on to construct elaborate leaf shelters. The latter behaviour, shared with *A. donysa* at least (A. Muyshondt, pers. comm.) but not reported for any other *Adelpha* species groups, is very similar to that of *Limenitis camilla* (Linnaeus) and *Limenitis reducta* Staudinger. Two opposing cuts, perpendicular to the leaf margin, are made from the margin to the midrib, and the leaf flaps pulled down and fastened with silk. The larva rests in the shelter when not feeding, and there is typically a curtain of dead leaf material left dangling by the feeding larva over the shelter entrance. The larva abandons the shelter in the late fourth or early fifth instar, after which it rests exposed on the leaf. Otero & Aiello (1996) make the interesting observation that this is when the larva changes colour to a uniform green, and it also seems likely that the great reduction in scoli is due to the protection gained from the shelter rendering them almost obsolete.

Habitat and adult ecology: The habitats and behaviour of this subspecies are typical of the species; I have observed males puddling along streams near Mérida, in Venezuela. Neild (1996) states that it is found from 1000-2000m in Venezuela. This subspecies occurs in the same montane habitats as *A. corcyra corcyra* and *A. seriphia pione*, and the ranges of each of these subspecies closely correspond. Although *A. alala* and *A. corcyra* are closely related, *A. seriphia* belongs in a different group within the genus, and the independent development of an entire orange postdiscal band on the dorsal surface of all three of these taxa is probably due to mimicry between them.

Specimens examined (153♂, 4♀): † - trans. to *A. a. negra*.
"**USA**" (1♂): *California*: no specific locality 1♂ BMNH-error. **VENEZUELA** (76♂, 2♀): *Barinas*: Quebrada Las Uvas, km 34 Barinitas-Apartaderos Jan. 1♂ MUSM; Santa Bárbara 2♂ BMNH; *Mérida*: La Mucuy 2300m May Sep. 2♂ MUSM; La Pueblita 1450-1550m Aug. 2♂ BMNH; Jacinto 1500m 1♂ BMNH; Mérida 1400-1500m Mar. Nov. Dec. 24♂, 1♀ BMNH, 5♂ ZMHU, 5♂ USNM, 3♂ AMNH, 3♂ BMB, 2♂ AFEN, 1♂ AME, 1♂ MNHN, 1♂ KWJH; Montan. Japi 2-3000m 3♂ BMNH; Monta. Sierra 3000m Oct. 5♂, 1♀ BMNH; Mt. Serpa May 1♂ JFL; Pedregosa 3000m Oct. 3♂ BMNH; Río Aldaregas 8000' 9/11/39 1♂ BMNH; Valle 2200m 3♂ BMNH; West of La Pueblita 1500-1600m Aug. 2♂ BMNH; *Táchira*: Mata Mula, P.N. El Tamá 1850-2020m Mar. 1♂ AFEN; *Not located*: no specific locality 2♂ BMNH, 1♂ ZMHU, 2♂ BMB. **COLOMBIA** (69♂, 1♀): *Boyacá*: Muzo 1♂ BMNH; Santa María 1♂ ESM; *Cundinamarca*: Bogotá 23♂ BMNH, 2♂ USNM; env. de Bogotá 2♂ BMNH; Cananche 1♂ BMNH; El Baldio 5400' Sep. 3♂ BMB; Fusagasugá 1♂† AMNH; La Vega 1900m Jan. 1♂ BMNH; Mt. Redondo Feb. 2♂ AME; Quebrada Tasajera Feb. 1♂ AMNH; *Meta*: U. Río Negro 850m 1♂ USNM; San Martín, Llanos of Río Meta 1♂ BMNH; Villavicencio 1♂† AMNH; *Nariño*: Ricaurte 1600m Sep. 1♂ ESM-error?; *Santander*: La Carmen, Río Opón region Nov. 1♂ AMNH; La Lechera Nov. 1♂ AMNH; La Soledad Dec. 1♂ AMNH; Río Opón Dec. 1♂ AMNH; San Gil Nov. 1♂, 1♀ JFL; *Vaupés*: Río Vaupés 1400m Aug. 1♂ AME; *Not located*: no specific locality 8♂ AMNH, 1♂ BMNH, 1♂ USNM, 2♂ BMB, 2♂ MNHN. **COUNTRY UNKNOWN** (7♂, 1♀): no specific locality 2♂ USNM, 2♂ MNHN, 3♂, 1♀ MCZ.

Adelpha aricia (Hewitson 1847)

Figs. **44**; 135; *284*

Identification, taxonomy and variation:

Adelpha aricia is very similar to *A. corcyra*, and the only wing pattern character that I can find which reliably separates all taxa of each species is the shape of the VFW subapical marking. In the subapical area of the VFW in *A. aricia* the inner and outer postdiscal series are straight in each cell space, notably in cell M_1-R_5, and the basal edge of the inner postdiscal series is also straight. In the subapical area of the VFW of *A. corcyra* the inner and outer postdiscal series are composed of basally pointing, arrow-shaped markings in each cell space, and the basal edge of the inner postdiscal series is convex. In practice, however, there is little difficulty in identifying specimens since the two species are not known to be sympatric, and in the only area where sympatry is plausible (southern Ecuador and northern Peru), the taxa of each species are usually readily distinguished by other wing pattern characters. Other distinguishing characters include a generally more falcate forewing and produced hindwing tornus in *A. aricia*, silvery ventral markings in *A. aricia serenita* and *A. a. portunus*, and at the distal edge of the VHW white postdiscal band there is a curved red-brown marking in cell Cu_1-M_3, but no brown markings in cell Cu_2-Cu_1. *Adelpha alala* is easily distinguished by the two clearly marked, round or oval white postdiscal spots at the DFW costa. There is some variation in the shape and colour of the DFW orange subapical marking and VHW markings in *A. aricia*, and three subspecies are recognised.

Given the similar wing patterns, apparent close parapatry and similar habitats, I had considered that *A. aricia* and *A. corcyra* might be conspecific. However, the male genitalia are surprisingly different between the two species, the clunicula of *A. aricia* being high and pointed, that of *A. corcyra* low and broad, thus warranting their separation. Nevertheless, the two species are clearly close relatives and *A. aricia* is the probable sister taxon to the group comprising *A. corcyra*, *A. tracta*, *A. pithys* and *A. donysa*.

Range and status: Eastern Andean slopes from north Peru (Amazonas) to Bolivia. In cloud forest habitats from 1500-3000m. Not uncommon.

Specimens examined: 174 (174♂)

Adelpha aricia aricia (Hewitson 1847)

Figs. **44a,b**; *284*

Heterochroa aricia Hewitson (1847: 263, pl. XXI, fig. 11)

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: "Bolivia//aricia Hew.//B.M. TYPE No. Rh. 9811 Heterochroa aricia ♂ Hew.//Syntype//Type"; **BMNH**(M): **ST**♂: "Bolivia Hewitson Coll. 79-69 Heterochroa aricia. 1.//B.M. TYPE No. Rh. 9812 Heterochroa aricia ♂ Hew.//Paratype" [both examined]

Adelpha aricia Hew., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies differs from *A. aricia serenita* by having slightly duller ventral coloration and by having the distal edge of the VHW white postdiscal band straight and bordered by a straight red-brown line in cells Cu_1-M_1; in *A. a. serenita* this red-brown line is formed of concave elements in each cell and disjointed slightly at each vein. *Adelpha a. portunus* differs in a similar manner on the VHW, and has reduced orange DFW subapical spots. The thickness and intensity of the orange postdiscal band on the DFW is variable to some extent, especially in cell Cu_2-Cu_1, while a few specimens have trace orange scaling in cell 2A-Cu_2 over the inner submarginal series on the DFW. While I believe this variation to be infrasubspecific, for the same reasons given under *A. alala negra* there may yet prove to be phenotypically distinct and constant populations on isolated cordilleras that merit subspecific recognition.

Hewitson (1847) described *A. aricia* based on Bolivian specimens in his own collection and the British Museum, and his detailed description, figure of the dorsal surface of the left hand wing pair and the two syntypes in the BMNH (Fig. 44a,b) leave no doubt as to its identity.

Range: Eastern slopes of the Andes from southern Peru to Bolivia.

Habitat and adult ecology: Nothing appears to be published on the ecology of this species; judging from museum specimens males are apparently uncommon, while the female appears to be unknown. The habits and habitat of this species are probably similar to those of the closely related *A. corcyra*. The nominate subspecies has been recorded from 1500m to 3000m.

Specimens examined (72♂):
PERU (32♂): *Cuzco*: Buenos Aires, Cosñipata 2300m Dec. 2♂ MUSM; Callanga 1500m 1♂ ZMHU; Marcapata 4500' 2♂ BMNH; Pillahuata May 2500m Jan. 1♂ MUSM; Yanamayo 2-2200m Feb. May 2♂ MUSM; "*Junín*": Chanchamayo 3♂ BMB-error; *Puno*: Agualani 10000' Oct. 3♂ BMNH; Limbani 10000' Nov. 8♂ BMNH; Oconeque-Agualani 6-9000' Mar. 2♂ BMNH; Oroya-Limbani Jan. 1♂ BMNH; Quiton Carabaya 7000' Sep. 1♂ BMNH; Río Inambari-Limbani Mar. 4♂ BMNH; *Not located*: no specific locality 2♂ BMNH. **BOLIVIA** (39♂): *La Paz*: Apolobamba 3♂ BMNH; Chaco 2-3000m 1♂ ZMHU; Cillutincara 3000m 1♂ ZMHU; Coroico 1♂ MCZ; Cusilluni May 1♂ MCZ; La Paz Apr. 2♂ BMNH, 1♂ MCZ; Pararani-Mapiri 5200' Mar. 1♂ AMNH; Unduavi 1♂ BMNH; *Cochabamba*: Cochabamba 6♂ BMNH; 5 days N. Cochabamba 1♂ MCZ; Incachaca 2220m Mar. Apr. 3♂ AME; Locotal 2600m 2♂ ZMHU; San Jacinto 1♂ BMNH, 1♂ ZMHU; *Not located*: Cocopunco 1♂ AMNH; no specific locality 11♂ BMNH, 1♂ AMNH. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Adelpha aricia serenita Fruhstorfer, 1915 **stat. rest.**

Figs. **44c,d**; 135a,b; *284*

Adelpha aricia serenita Fruhstorfer (1915: 516)

TL: Peru. **Types**: **BMNH**(T): **ST**♂: "aricia serenita Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Fruhstorfer Coll. B.M. 1933-131//Peru H. Fruhstorfer//TYPE//Type//Syntype" [examined]

=*A. aricia aricia* Hew., Hall (1938)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate subspecies as discussed in that account. *Adelpha aricia portunus* has the orange DFW postdiscal band reduced to subapical spots in cells M$_3$-R$_5$. Variation in *A. a. serenita* is similar to that seen in the nominate.

Fruhstorfer (1915) described this subspecies based on an unspecified number of specimens from Peru, one of which he figured as the dorsal surface of *A. aricia* (Fruhstorfer, 1913: pl. 108, a). He stated that it differed from the nominate in the thickness of the DFW orange subapical marking and in the pattern of the ventral reddish brown lines. I have examined a single syntype male in the BMNH (Fig. 44c,d). While the first of Fruhstorfer's two characters appears to be unreliable, the second is not, and as discussed under the nominate subspecies the two taxa are consistently distinct. Hall (1938) failed to note the diagnostic ventral characters and synonymised *serenita* with *A. aricia aricia*, and I therefore reinstate *serenita* as a good subspecies (**stat. rest.**).

Range: Eastern Andes in central Peru.

Habitat and adult ecology: There are no published observations of the natural history of this subspecies, which is presumably similar to the nominate subspecies. The locality data indicating that this subspecies occurs as low as 800-900m are almost certainly erroneous.

Specimens examined (67♂): **?** – subspecies identification uncertain.
"**ECUADOR**" (1♂): no specific locality 1♂ AME-error. **PERU** (63♂): *Ayacucho*: Río Piene, Apurímac 4♂ AMNH; *Cuzco*: Cuzco 1♂ MCZ; *Huánuco*: Cushi 1820-1900m 8♂ BMNH; Tingo María Mar. 1♂ AME; *Junín*: Chanchamayo Jan.-Aug. 2♂ BMNH, 2♂ BMB, 1♂ ZMHU; El Porvenir 900m Apr. 1♂ BMNH; Hda. Naranjal, N.E. Mina Pichita 1550-1650m Nov. 1♂ MUSM; La Merced 2500-3000' Aug.-Nov. 3♂ BMNH, 1♂ BMB, 1♂ MUSM; Perené R. Mar. 1♂ BMNH; Río Colorado 1♂ BMNH; San Luis de Shuaro Aug. 2♂ MUSM; *Pasco*: Huancabamba 6-10,000' Aug. 10♂ BMNH, 1♂ BMB, 1♂ MCZ; Pozuzo 800m Apr. 4♂ BMNH, 3♂ MUSM, 1♂ AME, 1♂ BMB; *Not located*: P.N. Puente Yanango Oct. 1♂ MUSM; no specific locality 2♂**?** USNM, 5♂ BMNH, 2♂ BMB, 1♂ MUSM, 1♂ MCZ. **COUNTRY UNKNOWN** (3♂): no specific locality 1♂**?** USNM, 1♂ BMNH, 1♂ MNHN.

Adelpha aricia portunus Hall, 1938

Figs. **44e,f**; *284*

Adelpha aricia portunus Hall (1938: 209)

TL: "Tambillo, Río Tabacones etc., Peru". **Types**: **BMNH**(M): **ST**♂: "Syntype ♂ Adelpha aricia portunus Hall G. Lamas det. 1987//Ex Oberthür Coll. Brit. Mus. 1927-3//Tambillo Peru Cordilieres J. Stolzmann 1878 9-II//Syntype"; 4**ST**♂: Chachapoyas; 2**ST**♂: Manchara; 2**ST**♂: Río Tabaconas; 7**ST**♂: Tambillo; **ST**♂: no locality; **BMB**: **ST**♂: Río Tabaconas; **ST**♂: Tambillo [all examined]

Identification, taxonomy and variation:

This subspecies is distinguished from *A. aricia serenita* by the reduced orange DFW postdiscal band. The orange subapical spots usually have white scaling at the basal edge, though this is variable, as is the size of the subapical spots, which may almost coalesce to form a band. There is a specimen in the MUSM from Libertad which has particularly broad orange markings in the DFW subapical area, lacking any white at the basal edge of the markings, but since these characters show variation in Hall's type series of *portunus*, some specimens of which approach the Libertad specimen in wing pattern, and I have seen only a single specimen of the latter, I am unable to say whether it represents a distinct subspecies.

Hall (1938) described this subspecies based on 17 specimens in the BMNH and 2 specimens in his own collection, all of which I have examined (Fig. 44e,f).

Range: This subspecies is known from the east Andean slopes of northern Peru, almost to the Ecuadorian border, strongly suggesting that it also occurs in the Cordillera de Lagunillas in southern Ecuador.

Habitat and adult ecology: Presumably similar to the nominate subspecies.

Specimens examined (35♂):
PERU (35♂): *Amazonas*: Chachapoyas 4♂ BMNH; *Cajamarca*: Manchara 7000' Sep. 2♂ BMNH; Río Tabaconas 6000' 2♂ BMNH, 1♂ BMB; Tambillo 7♂ BMNH, 1♂ ZMHU, 1♂ BMB; *Libertad*: Cumpang, Tayabamba-Ongón 2400-2700m Oct. 1♂ MUSM; *San Martín*: La Playa, P.N. Abiseo 2480-2680m Jul. 7♂ MUSM; Macedonia, P.N. Abiseo Aug. 2♂ MUSM; Quebrada El Peligro, P.N. Abiseo 2045m Aug. 2♂ MUSM; Río Montecristo, P.N. Abiseo 2600m Aug. 1♂ MUSM; *Not located*: Hda. Udima, Quebrada El Palmo 2400-2600m Nov. 3♂ MUSM; no specific locality 1♂ BMNH.

Adelpha corcyra (Hewitson, 1847)

Figs. **45**; 136; 219; *284*

Identification, taxonomy and variation:

Adelpha corcyra is very similar to some subspecies of *A. aricia*, but typically it has rounder hindwings and a duller brown VHW, and the inner and outer postdiscal series, which compose the pale VFW subapical marking, consist of basally-pointing, arrow-shaped markings in each cell, instead of straight dashes. The basal edge of the pale VFW subapical marking is also concave, instead of straight. The clunicula in the male genitalia is much shorter and broader than in *A. aricia*, confirming the distinctness of these two closely related, apparently parapatric species. *Adelpha pithys* and *A. donysa* are also similar but have more rounded hindwing shape, especially the distal margin which is scalloped, and the inner and outer postdiscal series on the VHW are even throughout the wing, not more pronounced in cells M$_1$-Rs and Rs-Sc+R$_1$, with a distinctly reddish brown ground colour. *Adelpha alala* is distinguished by the two well defined white oval postdiscal spots in the DFW near the costa. There is geographic variation in the presence or absence of an orange postdiscal band on the DHW, the shape of the orange DFW subapical marking and width of the white postdiscal bands, and five subspecies are recognised, two of which are described here.

The distinctive shape of the clunicula in the male genitalia is a synapomorphy grouping *A. corcyra* with *A. tracta*, *A. pithys* and *A. donysa* (Willmott, 1999, in prep.). The first three of these four species are allopatric in montane islands. I regard *A. corcyra* as a distinct species from *A. tracta* on the basis of the VHW character mentioned above to distinguish *A. corcyra* from *A. pithys* and *A. donysa*. This character is probably in its plesiomorphic state in *A. corcyra* (it occurs also in this state in *A. alala*), suggesting *A. tracta* is more closely related to *A. pithys*. For a discussion of why I regard *A. tracta* as distinct from *A. pithys*, see the account under the former species.

Range and status: Venezuela (Sierra de El Tamá, possibly Cordillera de Mérida) throughout Colombia, on both Andean slopes throughout Ecuador to the western slopes of extreme northern Peru. In intact cloud forest habitats from 1200-3000m, locally not uncommon.

Specimens examined: 290 (283♂, 7♀)

Adelpha corcyra corcyra (Hewitson, 1847)

Figs. **45a,b**; 136a,b; 219a,b; *284*

Heterochroa corcyra Hewitson (1847: 262, pl. XXI, fig. 9)

TL: New Granada [Colombia]. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//36//corcyra Hewitson//B.M. TYPE No. Rh. 9808 Heterochroa corcyra ♂ Hew.//New Granada//Type//Syntype"; **BMNH**(M): **ST**?♂: "N. Granada Hewitson Coll. 79-69 Heterochroa corcyra. 1."; **ST**?♂: "N. Granada Hewitson Coll. 79-69 Heterochroa corcyra. 2." [all examined]

Adelpha corcyra Hew., Kirby (1871)

Identification, taxonomy and variation:

Adelpha corcyra corcyra is distinguished from all other *A. corcyra* subspecies except *A. c. salazari* by the orange postdiscal band on the DHW. It differs from *A. c. salazari* as described under that subspecies. The width of the orange postdiscal markings on the DHW varies slightly, being especially thick in one male from Minas de Muzo and one male from Bogotá, both in the BMNH. Very occasionally the orange of the DFW subapical marking extends just into cell Cu_2-Cu_1, but never as strongly as in all specimens examined of *A. c. salazari*. *Adelpha alala completa* is also similar, but may be distinguished by the characters discussed in the species account for *A. corcyra*.

Hewitson (1847) described *corcyra* based on specimens in the British Museum from New Granada, and his description and figure of the dorsal surface leave no question as to the identity of the taxon. I have examined 3 probable syntypes in the BMNH (Fig. 45a,b), all of which correspond to the original description.

Range: Venezuela (Sierra de El Tamá, possibly Mérida) to Cordillera Oriental in Colombia as far south as Bogotá. Although accurate locality data are few, in the Bogotá area, this subspecies seems to occur in the mountains to the west of the city, while *A. c. collina* is found in the hills just behind Bogotá.

Habitat and adult ecology: Judging from the number of specimens in collections this subspecies is common, although if the record from Valencia in Venezuela is valid, it is very rare throughout the Mérida range. There are no published observations of the subspecies in the field, but specimen label data suggest it flies from 2200-2700m, throughout the year.

Specimens examined (99♂, 5♀):

VENEZUELA (3♂): *Carabobo*: Valencia 1♂ BMNH; *Táchira*: San Vicente de la Revancha 2350m Mar. 1♂ AFEN; Via Delicias Tamá Nov. 1♂ AFEN. **COLOMBIA** (91♂, 4♀): *Boyacá*: Arcabuco 2200m Jan. 1♂, 1♀ USNM; Muzo 1♂ BMNH, 1♂ BMB; N.E. of El Arenal 2400-2500m Jul. 1♂ BMNH; Parque Iquaque 2700m Jan. Apr. 1♂ ESM, 1♂ JFL; Santa Rosita Nov. 1♀ JFL; *Cundinamarca*: Barro Blanco, Madrid Nov. 1♂ ESM; Bogotá 23♂, 1♀ BMNH, 4♂ USNM, 1♂ MCZ; env. de Bogotá 1♂ BMNH; El Baldio 5400' Sep. 2♂ BMB; Pacho 1♂ BMNH; *Norte de Santander*: P.N. El Tamá, N. Santander 2500m Dec. 1♂ JFL; "*Tolima*": Río Chili Apr.-June 1♂ BMNH-error; *Not located*: "Cauca" 1♂ ZMHU-error; Interior 1♂ BMNH; Magdalena Valley 2♂ BMNH; Río Póroeca Jul. 1♀ AMNH; no specific locality 20♂ AMNH, 8♂ BMNH, 7♂ MCZ, 3♂ ZMHU, 6♂ BMB, 2♂ MNHN. "**BRAZIL**" (1♂): no specific locality 1♂ BMB-error. **COUNTRY UNKNOWN** (4♂, 1♀): no specific locality 2♂ ZMHU, 1♀ AME, 1♂ USNM, 1♂ MNHN.

Adelpha corcyra salazari Willmott, **ssp. nov**.

Figs. **45c,d**; *284*

Description and diagnosis: FW length of HT: 25.5 mm. Males differ from the nominate subspecies in having a broader orange subapical marking on the DFW, which is not divided into separate spots in each cell space by darker veins, and is of an even width, instead of being narrowest in cell M_2-M_1. The basal edge of the marking is straight, not incised at each vein, and the marking extends into cell Cu_2-Cu_1 to form a prominent triangular orange spot. Very occasionally this marking extends into cell Cu_2-Cu_1 in the nominate subspecies, but only as indistinct orange scaling. The DHW postdiscal orange band is always relatively heavy, there is no thin pale brown band distal of the white postdiscal band on the DHW, and on the VHW the white postdiscal band is not lined at its distal edge with an uneven, reddish brown line. The female is similar to the male.

Types: ***Holotype*** ♂: COLOMBIA: *Magdalena*: "Kancrúa 2108 2450m 26.viii.1972//B.M. 1973-106"; in the BMNH(A&B). ***Paratypes***: COLOMBIA (11♂, 1♀): *El César*: **1**♂: "San José N. Colombia F. Simons//♂//Adelpha corcyra Hew. Godman-Salvin Coll. 1916.-4."; in the BMNH(M); **1**♂: "above Sogrome Río Meoguachucua 1700-1800m 28.VIII.72//North Colombia: 2119 Sierra Nevada de Sta. Marta Exped. M.J. Adams & G.I. Bernard"; *Magdalena*: **5**♂: "Above Kancrúa (Tromba) 2500m 25.VIII.1972//North Colombia: 2077 Sierra Nevada de Sta. Marta Exped. M.J. Adams & G.I. Bernard"; **2**♂: east above San Pedro de la Sierra 22-2500m Aug.; in the BMNH(A&B); **1**♂**, 1**♀: Minca Magdalena 2400m Oct.; in the JFL; *Not located*: **1**♂: Sta. Marta; in the BMNH(R).

Etymology: This subspecies is named for Julián Salazar, for his generous hospitality during my visit to Colombia and for allowing me to view and take notes from his collection.

Taxonomy and variation: Santa Marta specimens differ in several slight but consistent characters from those of the nominate subspecies, and given the reasonable series examined, and their geographic isolation from the nominate subspecies, I believe they merit subspecific recognition.

Range: Sierra Nevada de Santa Marta in northern Colombia.

Habitat and adult ecology: This subspecies is known from 1700-2500m and has been collected in August and October. Judging from museum specimens, it is locally not uncommon.

Specimens examined (12♂, 1♀):

COLOMBIA (12♂, 1♀): *El César*: San José 1♂ BMNH; above Sogrome Río Meoguachucua S. N. de Santa Marta 1700-1800m Aug. 1♂ BMNH; *Magdalena*: Kancrúa 2450m Aug. 1♂ BMNH; above Kancrúa (Tromba) S. N. de Santa Marta 2500m Aug. 5♂ BMNH; Minca 2400m Oct. 1♂, 1♀ JFL; E. above San Pedro de la Sierra S. N. de Santa Marta 22-2500m Aug. 2♂ BMNH; *Not located*: Santa Marta 1♂ BMNH.

Adelpha corcyra aretina Fruhstorfer, 1907

Figs. **45e,f**; 136c; *284*

Adelpha corcyra aretina Fruhstorfer (1907: 172)

TL: Ecuador. **Types**: **BMNH**(M): **ST**♂: "Ecuad. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//Syntype ♂ Adelpha corcyra aretina Fruhstorfer G. Lamas det. 1987//Syntype"; **ST**?♂: "Fruhstorfer Coll. B.M. 1937-285//Ecuad. Fruhstorfer//corcyra collina Hew."; **ST**?♂: "Ecuador ex Coll. H. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//collina Hew." [all examined]

Adelpha corcyra collina Hew., Fruhstorfer (1915) misid.

Identification, taxonomy and variation:

Adelpha corcyra aretina is most similar to *A. corcyra dognini*, and is distinguished under that subspecies. It is distinguished from *A. c. collina* by the orange DFW subapical marking ending in the anterior half of cell Cu_2-Cu_1, instead of extending at least to vein Cu_2, and closely bordering the distal edge of the white postdiscal band, which is diagonal, sloping basally, instead of vertical. *Adelpha c. collina* also has a pinkish cast to the ventral surface. *Adelpha alala negra* is similar but may be distinguished by the characters discussed under the species account for *A. corcyra*. *Adelpha aricia portunus* may also be very similar, and is discussed under *A. corcyra dognini*.

Fruhstorfer (1907) described this subspecies through comparison with the nominate, from three Ecuadorian males in his collection, one collected by Richard Haensch, and two from Oberthür's collection. He stated that the orange DFW subapical marking was narrower (though this is not a constant character) as were the white dorsal postdiscal bands, but mysteriously failed to mention the lack of the orange postdiscal band on the DHW. Later, however, he confirmed that the DHW lacked the orange postdiscal band (Fruhstorfer, 1915). There are three Ecuadorian specimens in the BMNH from Fruhstorfer's collection, two of which are labelled *collina* Hew., while all three lack any further indication that they are syntypes of *aretina*. While these specimens may be true syntypes, which have been subsequently relabelled and thus lost data presented in the original description, I believe it is impossible to be sure. However, I am certain that the name *aretina* does indeed apply to the subspecies found from southern Colombia to central Ecuador, since the only sites in eastern Ecuador visited by Haensch were the Pastaza and Baeza areas (Haensch, 1903). He could have collected specimens of *A. c. collina* in western Ecuador, but since Fruhstorfer (1915) treated this taxon as a separate species, *Adelpha epidamna*, a synonym of *collina*, Fruhstorfer's *aretina* must apply to east Andean specimens of *A. corcyra*. Fruhstorfer (1915) also mistakenly applied the name *collina* to typical *aretina* (explaining why two potential syntypes listed above are labelled *collina*), and stated that the latter differed from the former in having narrower bands, a purely fictional difference possibly presented to avoid having to synonymise his own name *aretina*. At any event, since *collina* applies to a completely distinct taxon, *aretina* remains a valid name.

Range: The eastern Andean slopes from extreme southern Colombia to central eastern Ecuador.

Habitat and adult ecology: This subspecies occurs from 1200-2700m in association with primary cloud forest habitats, where it is almost always found along rivers and appears to fly throughout the year. Males are uncommon and usually encountered as solitary individuals flying swiftly about rocky *playas* puddling at damp sand, particularly at urine, and are attracted to rotting fish hung in traps along river banks. I have seen no female specimens.

Specimens examined (67♂):

COLOMBIA (2♂): *Nariño*: El Socorro, area a Monopamba 1500m Feb. 1♂ MHNUC; Monopamba 1750m Feb. 1♂ ESM. **ECUADOR** (64♂): *Morona-Santiago*: Limón-Gualaceo rd., km 22, 2050m Nov. 1♂ KWJH, 1♂ DAT; *Napo*: "Archidona" Apr. 1♂ BMNH-error; "Río Arajuno 700m" Mar. 1♂ AME-error; Río Chonta 2000m Oct. 1♂ KWJH; "*Pichincha*": Aloag 7♂ USNM-error; *Tungurahua*: env. de Ambato 16♂ BMNH, 1♂ BMB; Baños 5-7000' 3♂ BMNH; Mirador 1♂ AMNH; Río Blanco Apr. May 4♂ AME; Río Machay Jul. Aug. 2♂ KWJH; Río Topo 1400m Apr. 1♂ AME; Río Verde 5000' Jan. 1♂ BMNH; San Antonio 2100m Apr. 1♂ AME; Yunguilla, nr. Baños May 1♂ USNM; *Not located*: Oriente 4♂ AMNH; no specific locality 3♂ BMNH, 7♂ AMNH, 4♂ MCZ, 1♂ JFL. "**PERU**" (1♂): *San Martín*: Tarapoto 1♂ BMNH-error.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Limón-Gualaceo rd., km 22, Sep.; *Sucumbíos*: Río Palmar 1200m Nov.; El Higueron Nov.; *Tungurahua*: Río Machay Feb.; Río Ulba 2700m Nov. (Willmott & Hall, sight records).

Adelpha corcyra dognini Willmott, **ssp. nov.**

Figs. **45g,h**; *284*

Description and diagnosis: FW length of HT: 27 mm. Males differ from *A. corcyra aretina* by having a broader orange subapical marking on the DFW, of more even width, which has the veins coloured orange within the marking instead of dark brown, particularly vein M_1. The white postdiscal bands are broader on both wings and that on the DFW tapers from anal margin to cell M_3-M_2, whereas in *A. c. aretina* the white block in cell Cu_2-Cu_1 is of the same width as that in cell Cu_1-M_3. The DHW is darker in the distal half due to the expansion of the black band distal of the white postdiscal band, so that the pale brown area surrounding the triangular, blackish submarginal spots is restricted to a thin line closely bordering these spots, instead of a pale brown band. I have seen no female specimens. This subspecies is also very similar to certain specimens of *A. aricia portunus*, but has more rounded wings and can be distinguished as discussed under the species account for *A. aricia*.

Types: ***Holotype*** ♂: ECUADOR: "Ecuador Loja Dec. 1892 (P. Dognin) 1915-209"; in the BMNH(M). ***Paratypes***: ECUADOR (17♂): *Loja*: **1**♂: same data as HT; **1**♂: "Environs de Loja Equateur 83//32. 21. Ex Coll. Dognin 1921//Joicey Bequest Brit. Mus. 1934-120"; **1**♂: "Environs de Loja Equateur 1891//Joicey Bequest Brit. Mus. 1934-120"; in the BMNH(M); **1**♂: San Francisco Aug.; **1**♂: Env. de Loja Jul.; **1**♂: "Environs de Loja Equateur 1890//♂//Booth Mus. Coll. 001691//32.21 Ex Coll. Dognin 1921"; **1**♂: "Sta. Bárbara Equateur août '86//♂//Booth Mus. Coll. 001692//32.21 Ex Coll. Dognin 1921"; **1**♂: "Ecuador//♂//Ecuador//Ex Grose-Smith 1910//Booth Mus. Coll. 001689"; in the BMB; **1**♂: "Environs de Loja Equateur 1889//Collection W. Schaus"; **1**♂ "Environs de Loja Equateur 1889//Edw. T. Owen Collection"; **1**♂: "Loja Equateur Février '86//Edw. T. Owen Collection"; **1**♂: "Environs de Loja Equateur '87//Collection W. Schaus"; **1**♂: "Loja Equateur Février '86//Collection W. Schaus"; in the USNM; *Zamora-Chinchipe*: **1**♂: Quebrada San Ramón 1700m Oct.; in the KWJH; **1**♂: "Zamora Ecuador 3-4000' (O.T. Baron)"; in the BMNH(R); **1**♂: "Zamora, Equateur 1885 Abbé Gaujon//Collection W. Schaus"; in the USNM; *Not located*: **1**♂: "S. Ecuador//♂//Adelpha collina Hew. Godman-Salvin Coll. 1916.-4."; **1**♂: "Ecuador Hewitson Coll. 79-69 Heterochroa collina. 4."; **1**♂: "Ecuador Hewitson Coll. 79-69 Heterochroa corcyra. 3."; in the BMNH(M). PERU (1♂): *Piura*: **1**♂: "Peru, Pi, Camino Sapalache-El Carmen, entre Batán y Machete, 17-VI-80 2150m L.J. Barkley"; in the MUSM.

Etymology: This subspecies is named for P. Dognin, who collected several of the type specimens and was also the first to collect many distinctive taxa from southern Ecuador during the last two decades of the 19th century.

Taxonomy and variation: This subspecies differs from *A. c. aretina* in several respects, but nevertheless I deliberated for some time before deciding to describe it. Specimens of *A. c. aretina* from the Limón-Gualaceo road in eastern Ecuador, midway between the Pastaza and Zamora valleys, have slightly thicker DHW white postdiscal bands than typical *A. c. aretina*, and are probably showing intergradation with *A. c. dognini*. The single known Peruvian specimen has a slightly broader white postdiscal band on the DHW than typical *A. c.*

dognini, and it thus might be argued that the differences observed between *A. c. aretina* and *A. c. dognini* are all just part of clinal variation from north to south. However, since two characters, the broader orange subapical marking and anteriorly tapering DFW postdiscal band, consistently distinguish the two taxa in the relatively large series examined of both, and since both have relatively extensive geographic ranges in which there is little, if any, clinal variation, I believe the southern population merits subspecific recognition.

Range: East Andean slopes from southern Ecuador, in the Zamora valley, south to extreme northern Peru near the Ecuadorian border. Also on west Andean slopes from the Loja area at least as far south as Yangana. Any range data further north on the western slopes would be worth reporting; the location of the contact zone between *A. c. collina* and *A. c. dognini*, if there is one, is currently unknown.

Habitat and adult ecology: This subspecies is locally common in the Zamora valley, but apparently rarer in Peru, and has been reliably recorded from 1700-2700m. It is confined to cloud forest habitats, where males behave similarly to other subspecies and may be encountered as solitary individuals puddling at urine along rivers. I have also found males perching in elfin cloud forest along ridge tops above Loja, where they compete with several species of *Catasticta* (Pieridae) and numerous Lycaenidae for the highest bushes. While males seem to perch singly, when an individual is removed from the perching spot it is quickly replaced.

Specimens examined (19♂):
ECUADOR (18♂): *Loja*: Environs de Loja Jul. 2♂ BMNH, 1♂ BMB, 3♂ USNM; Sta. Bárbara Aug. 1♂ BMB; Loja Feb. Dec. 2♂ BMNH, 2♂ USNM; San Francisco Aug. 1♂ BMB; *Zamora-Chinchipe*: Quebrada San Ramón 1700m Oct. 1♂ KWJH; Zamora 3-4000' 1♂ BMNH, 1♂ USNM; *Not located*: S. Ecuador 1♂ BMNH; no specific locality 2♂ BMNH, 1♂ BMB. **PERU** (1♂): *Piura*: Camino Sapalache-El Carmen, entre Batán y Machete 2150m Jun. 1♂ MUSM.

Additional locality data: **ECUADOR**: *Loja*: La Entrada, nr. Yangana, 2500m May; above Loja 2500m May; *Zamora-Chinchipe*: Loja-Zamora old rd., c. km 2, 2700m May (Willmott & Hall, sight records).

Adelpha corcyra collina (Hewitson, 1847) **stat. rest.**

Figs. **45i,j**; *284*

Heterochroa collina Hewitson (1847: 262, pl. XXI, fig. 10)

TL: Quito [Ecuador]. **Types**: **BMNH**(T): **LT**♂: “B.M. TYPE No. Rh. 9809 Heterochroa collina ♂ Hew.//Quito//Type//Syntype”; **BMNH**(M): **PLT**?♂: “Ecuador Hewitson Coll. 79-69 Heterochroa collina. 1.”; **PLT**?♂: “Ecuador Hewitson Coll. 79-69 Heterochroa collina. 2//B.M. TYPE No. Rh. 9810 Heterochroa collina ♂ Hew.//Paratype”; **PLT**?♂: “Ecuador Hewitson Coll. 79-69 Heterochroa collina. 3.”; **PLT**?♂: “Ecuador Hewitson Coll. 79-69 Heterochroa collina. 4.” = *corcyra dognini* [all examined]

=*Heterochroa epidamna* C. & R. Felder (1867: 424)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: “Syntype//Type//Bogotá Lindig Type//epidamna Felder//epidamna n.” [examined]

Adelpha collina Hew., Kirby (1871); *Adelpha collina* var. *epidamna* Fldr., Kirby (1871); *Adelpha epidamna* Fldr., Fruhstorfer (1915); *Adelpha corcyra collina* Hew., Fruhstorfer (1915) – referring to *A. corcyra aretina*; *Adelpha collina* Hew., Hall (1938)

Identification, taxonomy and variation:

Adelpha c. collina is distinguished from all other *A. corcyra* subspecies by having the orange subapical marking on the DFW touching the white postdiscal spots in cells Cu_2-Cu_1 and Cu_1-M_3. There is local variation in whether the marking extends into cell 2A-Cu_2 or terminates at vein Cu_2, and the marking may be broken into small, isolated spots in each of cells M_3-R_5. Some specimens of *A. aricia* may be similar, but the orange subapical marking is always approximately straight in that species.

Hewitson (1847) described and clearly figured this subspecies based on specimens in the British Museum and his own collection from Quito. There is only a single specimen in the BMNH which bears the label “Quito”, and this came from Hewitson’s collection and closely matches the original figure, notably in having isolated orange subapical spots on the DFW. Since Hewitson’s description was clearly based on more than one specimen, and one potential syntype in the BMNH actually belongs to a different taxon (*A. corcyra dognini*), I designate as the lectotype of *Heterochroa collina* the Quito specimen mentioned above with the following label data: “B.M. TYPE No. Rh. 9809 Heterochroa collina ♂ Hew.//Quito//Type//Syntype”. It appears that Felder & Felder (1867) mistakenly believed *A. corcyra corcyra* to be Hewitson’s *A. c. collina*, since in their original description of the name *epidamna* they stated that it differed from *A. c. collina* in lacking orange postdiscal dashes on the DHW, while a single specimen in the BMNH(R) of *A. c. corcyra* from the Felder collection is identified as *A. c. collina*. The description of *epidamna* was based on an unspecified number of male specimens collected by Lindig at Bogotá, and a syntype is in the BMNH, with an additional specimen in the BMNH(R) with similar locality data. The original description refers to the poorly defined white postdiscal band on the VFW, a distinctive characteristic of this taxon. The syntype of *epidamna* differs from that of *collina* in having a broad, continuous orange band as the DFW subapical marking, but since this character is individually variable I regard the former name as synonym of the latter.

A. corcyra collina has historically been treated as a distinct species (Kirby, 1871; Fruhstorfer, 1915; Hall, 1938; D’Abrera, 1987), but since the genitalia do not differ from typical *A. corcyra*, there are no fundamental wing pattern differences and it occupies similar habitats to *A. corcyra*, I treat it as a subspecies (**stat. rest.**). Fruhstorfer (1915) placed the name *collina* as a subspecies of *A. corcyra*, but this was based on a misidentification and he was actually referring to *A. c. aretina*. There are no known cases of sympatry of this taxon with other *A. corcyra* subspecies, and although there are areas of close parapatry, particularly around Bogotá, I have seen no specimens indicating intergradation. Further collecting may conceivably show this taxon to be sympatric with other *A. corcyra* subspecies and therefore a distinct species.

Range: There are few accurate distributional data for this subspecies, and more are needed to determine the Colombian range more precisely. It occurs in Colombia on both slopes of the Cordilleras Occidental and Central, and in the Cordillera Oriental as far north as the mountains just south of Bogotá. It seems to be replaced in the mountains north and west of Bogotá by the nominate subspecies, and in the extreme south on the eastern Andean slopes by *A. c. aretina*. It also occurs on the western slopes of the Andes to northern Ecuador.

Habitat and adult ecology: This subspecies seems slightly more tolerant of disturbed habitats than *A. c. aretina*, but in its behaviour and preference for riverine microhabitats, and in its occurrence in cloud forests from 1500-3000m, it is very similar. In western Ecuador, I have found males to be locally not uncommon and attracted to rotting fish in river side traps and horse dung, and to puddle along river banks, especially at urine.

Specimens examined (86♂, 1♀):
“**PANAMA**” (1♂): *Chiriquí*: Lino 800m Fassl 1♂ BMNH-error. **COLOMBIA** (72♂, 1♀): *Antioquia*: Antioquia 2♂, 1♀ ZMHU; Las Palmas 8000' Jul. 1♂ BMB; Frontino 2♂ BMNH; Sonsón 2300m Aug. 1♂ JFL; Valdivia 1♂ BMB; *Caldas*: Bocatoma, Manizales 2100-2400m Mar. Jul. 1♂ MUSM, 2♂ MHNUC, 1♂ KWJH; Cerro Guadalupe Manzanares 2400m Nov. 2♂ KWJH; Manizales 4♂ BMNH, 1♂ BMB; *Caquetá*: Caquetá May Jun. 4♂ JFL; rd. to Florencia Mar. 1♂ ESM; *Cauca*: Cerro Munchique 1♂ AMNH;

Paletegá 3000m Dec. 1♂ ESM; Silvia 2500m Jul. 1♂ LMC; nr. Tacueyó 5500' Cauca Nov. 1♂ BMNH; *Cundinamarca*: Bogotá 2700-2900m Jan. Mar. Nov. 3♂ BMNH, 2♂ ESM, 1♂ AMNH, 1♂ USNM; Bogotá páramo 3000m Aug. 1♂ AMNH; San Miguel 3000m May 1♂ AMNH; Usquen, Bogotá 3000m Feb. 3♂ AMNH; *Nariño*: Pasto 2000' 1♂ MNHN; Piedrancha Dec. 3♂ AMNH; *Putumayo*: Pitalito-Mocoa Apr. 1♂ ESM; *Quindío*: Res. Nat. Acaime, Salento 2700m Jan. 1♂ MHNUC; Salento, Río Quindío 2800m Jan. Aug. 3♂ LMC; *Risaralda*: Pereira 1♂ BMNH; *Tolima*: Cañon del Tolima 1♂ MCZ; Río Ambeima 2000m Jun. 1♂ AME; *Not located*: Cauca 1♂ ZMHU; Cauca, Torné Jan. Feb. Aug. 16♂ BMNH; Cord. Oriental 3000m 1♂ AMNH; El Chico 3000m 1♂ AMNH; no specific locality 1♂ USNM, 1♂ BMB. **ECUADOR** (10♂): *Carchi*: Santa Rosa, Río Golondrinas Sep. Nov. 2♂ KWJH; *Pichincha*: Quito 1♂ BMNH; Río Las Palmeras 1900m Aug. 3♂ KWJH; Tandapi 1700m Aug. 1♂ KWJH; *Not located*: no specific locality 3♂ BMNH. “**PERU**” (2♂): *Junín*: Chanchamayo 1♂ BMNH, 1♂ BMB-error. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Additional locality data: **ECUADOR**: *Carchi*: El Corazón 2700m Sep.; *Pichincha*: Río Chisinche May; Tandapi 1700m Jul. (Willmott & Hall, sight records).

Adelpha tracta (Butler, 1872)

Figs. 6a,9,11; **46a,b**; 137a,b; 220a,b; *285*

Heterochroa tracta Butler (1872b: 102, pl. 38, fig. 6)

TL: Cartago, Costa Rica. **Types**: **BMNH**(T): **ST**♂: “B.C.A. Lep. Rhop. Adelpha tracta Butl. Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9814 Heterochroa tracta ♂ Butl.//H. tracta Butl. Type//♂//Costa Rica Van Patten Druce Coll.//Type//Syntype”; **BMNH**(M): **ST**?♀: “B.C.A. Lep. Rhop. Adelpha tracta Butl. Godman-Salvin Coll. 1916.-4.//Costa Rica Van Patten Druce Coll.//♀” [examined]

Adelpha tracta Butl., Kirby (1877)

Identification, taxonomy and variation:

Adelpha tracta is a distinctive species, superficially similar perhaps only to *A. levona* and *A. rothschildi*, which have the orange DFW postdiscal band split into separate spots and lack the third discal cell bar on the VFW. There is little variation in the specimens examined.

Butler (1872b) described and clearly figured this species based on specimens of an unspecified number and sex collected by Van Patten in Cartago, Costa Rica, in Druce's collection. I have examined a syntype male and probable syntype female in the BMNH.

Adelpha tracta is a member of the *A. alala* group, which may be recognised by the third discal cell bar on the VFW (a plesiomorphy), in addition to less obvious synapomorphic characters (Willmott, in prep.). The broad and short clunicula in the male genitalia place it in a group that includes *A. corcyra*, *A. pithys* and *A. donysa*. Among these species, the reduction or loss of the entire inner postdiscal series on the VHW and reddish ground colour of the distal half of the VHW groups *A. tracta*, *A. pithys* and *A. donysa*. The similar hindwing shape and the shape of the DFW orange subapical marking suggests that *A. tracta* and *A. pithys* are sister taxa, and I treat them as distinct species on the basis of the fusion of the inner postdiscal series with the postdiscal band on the DFW in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ in *A. tracta*, a character unique within the *A. alala* group and rare among primitive *Adelpha*. I have not found consistent genitalic differences between the two species, but this also applies to *A. pithys* and *A. donysa*, and many other closely related *Adelpha* species.

Range: Nicaragua to western Panama, in montane areas.

Immature stages: The larvae have been reported feeding on an unidentified genus of Rubiaceae in Costa Rica (Haber & Chacón, *In*: DeVries, 1987), in addition to *Viburnum costaricanum* (Caprifoliaceae) (W. Haber, pers. comm.). Bill Haber (pers. comm.) informs me that he believes the record of Rubiaceae is probably erroneous, since he has numerous oviposition and feeding records on *Viburnum*, but none on any rubiaceous plant. *Viburnum* is the expected hostplant, given the close relationship of this species with *A. alala*, *A. donysa* and *A. pithys*.

I have examined the cast integument of a fifth instar larva of this species in the PJD, and the larva appears to be similar to *A. alala* and *A. donysa*, in lacking well-developed scoli throughout most of the body (Fig. 6a). The head capsule (Fig. 9), with its very reduced chalazae, and the pupa (Fig. 11) are also similar in morphology to both of those species. Haber and Chacón (*In*: DeVries, 1986) report solitary late instar larvae feeding on all leaves of plants along forest edges. The pupa collected by Haber in the PJD hatched after 16 days.

Habitat and adult ecology: DeVries (1987) reports this species in Costa Rica to be widespread and common in all forest habitats, from 800-3000m. Solitary individuals are encountered along road cuts and forest edges during periods of sun, and males perch from 1-3m high on vegetation until the early afternoon. Both sexes are attracted to rotting fruits of Lauraceae and Melastomataceae, and males feed at wet sand and mammal dung. A single male in the AMNH was apparently captured at lights at night. The atypical dorsal pattern of this species (for the *alala* group) may result from mimicry with other sympatric cloud forest *Adelpha*, such as *A. ethelda*, *A. salus* and *A. salmoneus*.

Specimens examined: 81 (50♂, 31♀)

NICARAGUA (8♂, 2♀): *Managua*: Managua Oct. 2♂ USNM; *Matagalpa*: Matagalpa Aug.-Oct. Dec. 5♂, 1♀ AMNH, 1♀ AME; *Not located*: no specific locality 1♂ BMNH. **COSTA RICA** (17♂, 14♀): *Alajuela*: Volcán Poás Mar. Apr. 1♂ BMNH, 1♂, 1♀ USNM; *Cartago*: Azaher de Cartago 1♀ BMNH; Cerro de la Muerte 5000' Sep. 1♂ AME, 1♂ FSCA; El Alto 5000' Oct.-Dec. 2♀ BMB; Irazú 6-7000' 1♂ BMNH; Tres Ríos 5000' Jan. 1♂, 1♀ USNM; *Heredia*: Río Sarapiquí 1300m Jun. 1♂ USNM; *Puntarenas*: Las Alturas 4700' Mar. coll. at light J.S. Miller 1♂ AMNH; Monteverde 4500' Jul. 1♂ AME; *San José*: Bajo La Hondura 1200m Aug. 1♀ AME; Carrillo Sep. Oct. 2♂ BMB; Río Sucio 1♂ BMNH; *Not located*: Agua Caliente Sep. 1♂ BMNH, 1♀ BMNH; no specific locality 2♂, 5♀ BMNH, 1♂ ZMHU, 1♀ BMB, 1♂, 1♀ AMNH. **PANAMA** (25♂, 13♀): *Chiriquí*: Chiriquí Feb. 5♂, 3♀ BMNH, 4♂, 1♀ ZMHU, 2♂ USNM, 2♂ BMB, 2♂ AMNH; Potrerillos 3600' Jan.-Mar. 2♀ FSCA, 1♀ AME, 2♂, 3♀ USNM; Potrero Seco, Chiriquí 1♂, 1♀ BMNH; Santa Clara 1200m Sep. 1♂ USNM; Valle de Chiriquí 3-4000' 3♂, 1♀ BMNH; Volcán Barú 1800m Feb. Apr. 2♂, 2♀ USNM; *Veraguas*: Veraguas 1♂ BMNH; *Not located*: no specific locality 1♀ MNHN. “**COLOMBIA**” (1♀): *Cundinamarca*: Bogotá 1♀ BMNH-error. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ USNM, 1♂, 2♀ MCZ.

Additional locality data: **NICARAGUA**: *Matagalpa*: Res. Biol. El Arenal 1400-1500m Jan. May Jun. Aug. Sep. (Van den Berghe & Maes, 1999).

Adelpha pithys (H. W. Bates, 1864)

Figs. **47a,b**; 138a-c; 221a,b; *285*

Heterochroa pithys Bates (1864: 128)

TL: Guatemala. **Types**: **BMNH**(T): **ST**♂: “pithys Bates//B.C.A. Lep. Rhop. Adelpha pithys Bates Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9822 Heterochroa pithys ♂ Bates//♂ Guatemala tableland//Centr. Valleys Guatemala F.D.G. & O.S.//Type. sp. figured//Type H.T.”[examined]

=*Adelpha pithys vodena* Fruhstorfer (1915: 524) **stat. nov.**

TL: Guerrero, Mexico. **Types**: **BMNH**(M): 2**ST**?♂: “Guerrero Mexico (O.T. Baron)//Adelpha “pithys pithys” det. R.I. Vane-Wright 1989//ex Rothschild Coll.//Rothschild Bequest B.M. 1939-1” [both examined]

Adelpha pithys Bates, Kirby (1871)

Identification, taxonomy and variation:

Adelpha pithys is very similar to *A. donysa*, from which it is distinguished by being smaller, by having the area between the first and second VFW and VHW discal cell bars only slightly paler or the same colour as the discal cell ground colour (in *A. donysa* this area is reddish brown, as is the discocellular area), and by the pale postdiscal shading, which represents the upper postdiscal band on the VFW, being connected to the lower postdiscal band, so that there is a continuous thin brown line from the costa to vein M$_3$ bordered on both sides by pale shading. In *A. donysa*, the upper postdiscal band is typically present as pale shading only in cells M_2-M_1 and M_1-R_5, sometimes slightly extending into cell M_3-M_2, but almost never so as to form a continuous brown line within the pale area as in *A. pithys*. The inner and outer submarginal series on the VHW of *A. pithys* are separated only by a thin reddish brown line, whereas in *A. donysa* this line is thicker. Other characters that distinguish the two species outside of Guatemala (see under *A. donysa* for discussion of Guatemalan specimens) include, in *A. pithys*, the more pointed hindwing, the broader hindwing band and the narrower DFW orange subapical marking, which does not have so smooth a basal edge. *Adelpha corcyra* lacks the rich reddish coloration of the ventral surface, in addition to having several other distinguishing characters which are discussed under that species. The ventral surface of *A. pithys* varies slightly in the amount of silvery coloration, otherwise this species is quite phenotypically stable.

Bates (1864) described this species from a male specimen or specimens, in comparison with *A. iphiclus*, and his description clearly mentions several distinguishing features, such as the third cell bar in the VFW discal cell. Godman & Salvin (1884) later stated that they were figuring the type specimen which they had collected near Dueñas, and their illustration corresponds closely with the syntype in the BMNH(T). Fruhstorfer (1915) described *vodena* as a subspecies of *A. pithys*, stating that it was larger than typical specimens, with a "considerably narrower" hindwing postdiscal band, darker ventral colours and "prominent reddish-brown delimitation of the white discal band" on the VHW. However, he gave no information on the number, sex or whereabouts of the type specimens, only that they were from Guerrero in Mexico. Miller & Miller (1970) concluded that Fruhstorfer was unaware of true *A. donysa* and redescribed it as *vodena*, since *A. donysa* generally differs from *A. pithys* in also having a darker ventral surface and thinner white postdiscal bands, and synonymised *vodena* with *donysa*. However, I have examined two specimens in the BMNH from Guerrero which are indeed slightly larger than the type of *A. pithys*, with slightly narrower hindwing postdiscal bands and a conspicuous red-brown coloration distal of the VHW postdiscal band (Fig. 47a,b). These are the only specimens, except for a single male of typical *A. donysa* in the BMNH, that I have seen from Guerrero in a collection which could have been examined by Fruhstorfer, and I believe they may well be the specimens on which *vodena* was based. Fruhstorfer was prone to exaggeration, particularly when describing new taxa, and it seems he was aware of true *A. donysa*, which had been figured by Hewitson (1847), as he discusses accurately its distinguishing features (Fruhstorfer, 1915). I therefore conclude that *vodena* is a synonym of *pithys* (**stat. nov.**), since Guerrero specimens do not differ in any consistent manner from specimens from elsewhere in the range.

Adelpha pithys is probably the sister species to *A. tracta*, and my reasons for retaining these two allopatric taxa as distinct species are discussed under the latter species.

Range: Montane areas from Mexico to El Salvador, with a plausible record from Honduras which should be confirmed.

Immature stages: Albert Muyshondt (pers. comm.) reared this species on a shrub in the family Caprifoliaceae (probably the same as that used by *A. donysa roela*) in El Salvador.

Habitat and adult ecology: De la Maza (1987) reports this species from cloud forest and occasionally pine-oak forest in Mexico, and de la Maza & de la Maza (1993) give a range of 1300-2800m in Chiapas. Godman & Salvin (1884) reported the species from as low as 700m in Guatemala. Specimen label data indicate that it flies from March to December at least, and is locally common.

Specimens examined: 188 (152♂, 36♀)

MEXICO (33♂, 21♀): *Chiapas*: Comitán Mar.-Jun. Sep. 4♂, 9♀ AME; Jaltenango 1000m Apr. 1♂ AME; Lagos de Montebello 1300-1500m Feb. 4♂ AME; Mt. Huitepec 8000' Mar. 1♂ AME; Ocozingo 2♂ AME; Pichucalco May 2♂, 1♀ AME; San Carlos Jul. 4♂ AME; San Jerónimo Dec. 2♂, 1♀ AME; no specific locality Jul. 2♂, 6♀ AMNH, 1♀ AME, 1♂ MCZ; *Guerrero*: Acahuizotla May Oct. 2♂ AME; El Faisanal, Paraíso Dec. 1♂ AME; no specific locality 2♂ BMNH; *Oaxaca*: Candelaria Loxicha Nov. 1♂ AME, 1♂ AMNH; Oaxaca 1♂, 1♀ AMNH; Oaxaca, 192 km from, Dec. 1♀ AMNH; Portillo del Rayón 1500m Aug. Nov. 2♂ AME; *Veracruz*: El Vigía Aug. 1♀ AME. **GUATEMALA** (112♂, 15♀): *Alta Verapaz*: Baléu 1350m Jun. Aug.-Oct. 29♂, 6♀ AMNH, 33♂, 1♀ AME, 1♂ MUSM, 1♂ MHNUC; Polochic Valley 1♂, 1♀ BMNH; Río Sacaya Sep. 1♂ USNM; San Cristóbal 4000' May 3♂ BMNH, 1♂ BMB; Tactic 1♂ USNM; Tamahú Oct. 8♂, 2♀ AMNH; *Antigua*: Antigua Jul. Aug. 1♀ BMB; *Chimaltenango*: Quisache Jul. 1♂ AME; Yepocapa 2♂ AMNH; *Guatemala*: Guatemala city 1♂ BMNH; *Quezaltenango*: Acatenango Aug. Oct. 2♂, 1♀ AMNH; Volcán Santa María 4-6000' Apr. Oct. Nov. 5♂, 1♀ BMNH, 9♂, 2♀ USNM, 5♂ BMB; *Retalhuleu*: San Felipe 2000' Aug. 3♂ BMB; *Sololá*: vic. L. Atitlán Apr. 1♂ MCZ; Solalá 1♂ BMNH; *Zacapa*: Zacapa Vall. Oct. 1♂ BMB; *Not located*: Central Valleys 1♂ BMNH; Cuchumatanes Mts. 1500m Mar. 1♂ AME. **HONDURAS** (1♂): no specific locality 1♂ ZMHU. "**PANAMA**" (1♂): *Chiriquí*: Chiriquí 1♂ BMNH-error. **COUNTRY UNKNOWN** (5♂): no specific locality 5♂ USNM.

Additional locality data: **MEXICO**: *Chiapas*: Selva Lacandona (de la Maza & de la Maza, 1993); *Guerrero*: Nueva Delhi; *Oaxaca*: Jalatengo (de la Maza, 1987). **EL SALVADOR**: *Sonsonate*: Cerro Verde, nr. Volcán Izalco 2000m (A. Muyshondt, pers. comm.)

Adelpha donysa (Hewitson, 1847)

Figs. **48**; 118; 139; 222; *285*

Identification, taxonomy and variation:

Adelpha donysa is closely related and can be phenotypically very similar to *A. pithys*, and its diagnostic characters are discussed under that species. There is geographic variation in the width of the white DHW postdiscal band and DFW orange subapical marking, and two subspecies are recognised.

Wing pattern and male genitalia indicate that *A. donysa* belongs to a group of closely related, montane species, which includes *A. pithys*, *A. tracta*, *A. corcyra*, *A. aricia* and *A. alala*. This group is one of the most primitive of the genus.

Range and status: Mexico to western Honduras, in montane areas from 1800-2700m. Rare in collections but apparently locally common in the field.

Specimens examined: 68 (52♂, 16♀)

Adelpha donysa donysa (Hewitson, 1847)

Figs. **48a,b,e,f**; 139c; 222a,b; *285*

Heterochra donysa Hewitson (1847: 260, pl. XX, fig. 5)

TL: Mexico. **Types**: **BMNH**(M): **LT**♂: "B.M. TYPE No. Rh. 9821 Heterochroa donysa ♂ Hew.//Mexico Hewitson Coll. 79-69 Heterochroa donysa. 1.//Donysa W.H.//Syntype"; **PLT**♂: "Mexico 44. 13.//Syntype"; **PLT**♂: "Mexico 44. 13.//Syntype//T.G.H. 1962-541"; **PLT**♀: "Syntype//type//Mexico 44. 13.//B.M. TYPE No. Rh. 9820 Heterochroa donysa ♀ Hew.//Donysa Hewitson" [all examined]

=*Heterochroa roela* Boisduval (1870: 46)

TL: Mexico. **OTL**: Honduras; Mexico. **Types**: **BMNH**(T): **LT**♂: "Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3//=Heterochroa pithys Bates//Vu par Godman en Janvier 1883//Roela Bd. Méxiq.//Heterochroa Roela, Bdv. Méxique//Méxique//Typicum Specimen//Type//Syntype" [examined]

Adelpha roela Boisd., Kirby (1871); *Adelpha donysa* Hew., Kirby (1871)

Identification, taxonomy and variation:

Adelpha donysa donysa is easily distinguished from *A. d.*

albifilum by the wider DHW white postdiscal band which extends almost to touch vein 2A. It is very similar to *A. pithys*, and distinguishing characters are discussed under that species. There is a reasonable amount of variation in Mexican specimens in the width of the white dorsal postdiscal bands, the width of the orange subapical marking and the overall size. Miller & Miller (1970) figure a particularly extreme example from Hidalgo, in which the orange DFW subapical marking is almost equal in width to the white DFW postdiscal band. However, there is a specimen in the syntypic series of *donysa* with the white band almost as thick, in addition to a specimen from Calderas, Guatemala, and since the variation appears to be largely individual rather than geographic, I do not recognise distinct subspecies within Mexico.

Hewitson (1847) described this species based on specimens in his collection and the British Museum from Mexico, and his figure of the dorsal surface of the left hand wing pair establishes beyond doubt the identity of the taxon. There are several syntype specimens in the BMNH, none of which have accurate locality data. The width of the white postdiscal band is slightly variable in this series, and since future, more extensive, collecting may demonstrate the existence of several consistently distinct taxa within Mexico, I designate as lectotype of *Heterochroa donysa* the following specimen in the BMNH(M), which closely matches Hewitson's original figure: "B.M. TYPE No. Rh. 9821 Heterochroa donysa ♂ Hew.//Mexico Hewitson Coll. 79-69 Heterochroa donysa. 1.//Donysa W.H.//Syntype" (Fig. 48a,b). Boisduval (1870) introduced the name *roela* based on a single specimen from Honduras and a single specimen from Mexico, both in the collection of M. de l'Orza in Paris. The only specimen I have seen to date of *A. donysa* from Honduras is clearly the same taxon as *albifilum*, but this specimen is not from Oberthür's collection, where Boisduval's collection passed, and therefore cannot be a syntype of *roela*. Moreover, the original description is sufficiently detailed to determine that Boisduval was describing a specimen that belonged to the nominate subspecies. He stated that the DHW had a very narrow white discoidal ray which terminated towards the tornus (in *albifilum* it terminates in the middle of the wing), that this ray was not exactly aligned with that on the DFW (similarly to nominate *donysa*), and that the DFW orange subapical marking terminated "brusquement" at vein Cu_1 (in *albifilum* it continues across the vein well into the middle of cell Cu_2-Cu_1). I therefore conclude that the Honduras specimen was either mislabelled or represents a population in Honduras that has remained uncollected ever since. Godman & Salvin (1884) examined the second, Mexican, syntype and synonymised *roela* with *donysa*, in which they were followed by subsequent authors (Fruhstorfer, 1915; Miller & Miller, 1970), and to avoid any possible future confusion I designate this specimen, with the following label data, as the lectotype of *Heterochroa roela*: "Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3//=Heterochroa pithys Bates//Vu par Godman en Janvier 1883//Roela Bd. Méxiq.//Heterochroa Roela, Bdv. Méxique//Méxique// Typicum Specimen//Type//Syntype".

In the BMNH(M) are two male specimens from the Polochic Valley in Guatemala (Fig. 48e,f), which Godman & Salvin (1884) referred to as *A. donysa*. These specimens bear the following data: "Polochic Valley F.D.G. & O.S.//♂//B.C.A. Lep. Rhop. Adelpha donysa Hew. Godman-Salvin Coll. 1916.-4.". They differ from typical *A. donysa* in having thicker white postdiscal bands, a more pointed hindwing shape similar to *A. pithys*, a much thinner orange DFW subapical marking, again similar to *A. pithys*, and the VHW submarginal series are closer together, but not as close as in typical *A. pithys*. They do however have the characters typical of *A. donysa* which are discussed under *A. pithys*, and since typical *A. pithys* is also known from the Polochic valley I believe the specimens may well represent a new subspecies of *A. donysa*. Since I have also examined specimens of typical *A. donysa* from the same region, it may be that subspecies in this region are confined to small montane islands, but the specimens I have examined have insufficiently precise locality data to examine this possibility. The male genitalia of the figured specimen (Fig. 48e,f) do not differ from typical *A. donysa* or *A. pithys*.

Range: Montane areas from Mexico to Guatemala.

Habitat and adult ecology: This species is rare in collections, and de la Maza (1987) reports it from November to May in montane semi-deciduous forest and occasionally pine-oak forests, from 1800-2700m (de la Maza & de la Maza, 1993). Miller & Miller (1970) report the species to be locally common in Hidalgo, in Mexico, in association with deciduous, scrub oak-juniper habitat, and suggested that, due to the strong dry season there, *A. donysa* might be univoltine. They state that individuals sunned themselves in the morning up to 10.00am, either on leaves or the ground with the wings open, and also perched on prominent leaves with the wings held almost closed, whence they made brief sorties to investigate passing butterflies. Later in the day the butterflies were only seen near the tops of the trees, and due to a close association with oaks by the adults, they suggested that this might be the hostplant. This seems unlikely, however, given the records of other *A. alala*-group members, and *A. donysa albifilum*, on Caprifoliaceae.

Specimens examined (24♂, 11♀):

MEXICO (20♂, 8♀): *Chiapas*: Mt. Huitepec 8000' Mar. 1♂ AME; Rancho Belem Mar. 1♀ AME; San Cristóbal de las Casas Mar. Sep. 2♂ FSCA, 1♀ AME; *Guerrero*: Omiltene, wooded mountains 1700-2000m Jul. 1♂ BMNH; *Hidalgo*: Zimapán, 5 mi. N.W., 2140m pinon-oak-juniper scrub Jan.-Mar. 1♂ BMNH, 11♂, 4♀ AME; *México*: Valle de Bravo Nov. 1♂ AME; *Oaxaca*: La Esperanza 1750m Mar. 1♀ AME; *Not located*: no specific locality 4♂, 1♀ BMNH, 1♂ MNHN. **GUATEMALA** (2♂, 3♀): *Alta Verapaz*: Baléu 1♀ AMNH; Tactic Jul. 1♀ USNM; *Jutiapa*: Calderas 1♂ BMNH; *Quezaltenango*: Volcán Santa María Apr. 1♀ USNM; *Not located*: Chicnamac 1♂ AMNH.

Additional locality data: **MEXICO**: *Chiapas*: Macizo Central; Sierra Madre (de la Maza & de la Maza, 1993); *Guerrero*: Filo de Caballo; Teotepec; *Hidalgo*: La Encarnación; *Oaxaca*: Portillo del Rayo (de la Maza, 1987).

ssp. nov.?

GUATEMALA: (2♂) *Alta Verapaz*: "Polochic Valley F.D.G. & O.S.//♂//B.C.A. Lep. Rhop. Adelpha donysa Hew. Godman-Salvin Coll. 1916.-4." 2♂ BMNH(M).

Adelpha donysa albifilum Steinhauser, 1974 **stat. nov.**

Figs. **48c,d**; 118a,b; 139a,b; *285*

Adelpha albifilum Steinhauser (1974: 2, figs. 1-4, 57, 58)

TL: Hda. Montecristo, Cerro Miramundo Cloud Forest, El Salvador. **Types**: **AME**: **HT**♂: Hda. Montecristo 2418m Mar.; 26**PT**♂, 4**PT**♀: Cerro Miramundo Cloud Forest 2300-2418m Dec.-Apr. [all examined] See Steinhauser (1974) for list of remaining type specimens.

Identification, taxonomy and variation:

This subspecies is easily distinguished from other *A. donysa* subspecies by the narrow DHW postdiscal band, which terminates in the middle of the wing, in addition to the relatively broad DFW orange subapical marking which extends into cell Cu_2-Cu_1 and the dark ventral surface, particularly the reduced or absent hindwing submarginal series. The width, and therefore the length, of the DHW postdiscal band is slightly variable, and in some specimens it may be entirely absent.

Steinhauser (1974) described this taxon as a full species from 42 male and 4 female specimens, all captured at the type locality, and I have examined the holotype (Fig. 48c,d) and a long series of paratypes at the AME. The principal justifications for considering the taxon a distinct species were the wing pattern differences and putative genitalic differences, Steinhauser stating that the clunicula in *A. albifilum* was prominent, while that in *A. donysa* was absent, and that in *A. pithys* was only "indicated as a serrate edge". I have examined specimens of all three of these taxa and can find no consistent differences in the genitalia, and I conclude that Steinhauser's comments were based on the genitalic figures in Miller & Miller (1970), to which he refers. In those figures the clunicula is omitted in *A. donysa*, while in *A. pithys* it is "indicated as a serrate edge". The width of the DHW postdiscal band and DFW orange subapical band is variable both in *A. d. albifilum* and in the nominate subspecies, and since *A. d. albifilum* exhibits no fundamental wing pattern differences from nominate *A. donysa*, and occurs allopatrically in similar habitats, I regard the two taxa as conspecific (**stat. nov.**).

Range: This subspecies is known from a small area in El Salvador, with a single record from Honduras, presumably in the extreme west and probably on the Pacific slope.

Immature stages: Albert Muyshondt (pers. comm.) reared this taxon on a shrub in the family Caprifoliaceae, that was very common along a fence line at 2500m in El Salvador. He (pers. comm.) also recorded an almost complete life history for the taxon, and the fifth instar larvae and pupa are figured (Fig. 118a,b). The last instar is clearly very similar to that of *A. alala* (see Otero & Aiello, 1996) and *A. tracta*, in having most of the scoli almost absent, but it differs from *A. alala* notably in having the T3 scolus as well-developed as that on T2. The body coloration is also distinctive, with a uniformly dark brown dorsal surface. The pupa is also morphologically similar to those of *A. alala* and *A. tracta*.

Habitat and adult ecology: Steinhauser (1974) reports that males of this subspecies were frequently seen at the type locality hill topping at the summit of Cerro Montecristo, where the cloud forest is replaced by a heath scrub. When hill topping, males remained on low sunny perches beneath the top of the scrub, while in the forest they could be observed flying in sunny areas in the understorey or visiting wet sand, mud and dog dung in clearings. Similarly to the nominate subspecies, males were sometimes seen perching on the road. The subspecies is evidently locally common and has been recorded from November to May, from 2300-2500m.

Specimens examined (28♂, 5♀):

EL SALVADOR (28♂, 4♀): *Santa Ana*: Cerro Miramundo Cloud Forest 2300-2418m Dec.-Apr. 28♂, 4♀ AME. **HONDURAS** (1♀): *Not located*: Montagne de la Sapote, Dept. de Copay [Copán?] 1♀ BMNH.

Adelpha fessonia (Hewitson, 1847)

Figs. 9,12; **49**; 140; 223; *286*

Identification, taxonomy and variation:

Adelpha fessonia is the only *Adelpha* species in which the DFW postdiscal band is white and continues unbroken from the costa to the anal margin. There is variation in *A. fessonia* in the width of the dorsal postdiscal bands and DFW subapical marking, the extent of reddish-brown scaling in the DFW discal cell, and the colour of the ventral surface, and four subspecies are recognised, one of which is described here.

Adelpha fessonia is one of the most primitive members of the genus, and despite the differences in dorsal wing pattern, it may well be the sister species to *A. gelania*. The valvae of the male genitalia in both of these species are of a similar shape and lack spines, an uncommon character amongst other primitive *Adelpha*, although the female genitalia of *A. gelania*, which differ from most primitive *Adelpha* in lacking sclerotised bands on the corpus bursae, suggest that *A. gelania* and *A. fessonia* have been isolated for a relatively long time.

Range and status: Extreme southwestern USA to northeastern Venezuela, and the island of Hispaniola, in deciduous forest and cloud forest habitats, from sea level to 1950m. Common in western parts of its range, rarer in the east. Most subspecies appear to be disjunct. Not known to date from apparently suitable deciduous forest habitats in central and southwestern Ecuador, but may well occur there.

Specimens examined: 307 (173♂, 134♀)

Adelpha fessonia fessonia (Hewitson, 1847)

Figs. 9,12; **49a,b**; 140a,b; 223a,b; *286*

Heterochroa fessonia Hewitson (1847: 260, pl. XX, fig. 6)

TL: Honduras. **Types**: **BMNH**(T): **ST**♀: "B.M. TYPE No. Rh. 9817 Heterochroa fessonia ♀ Hew.//fessonia Hewitson//Honduras//Type//Syntype" [examined]

Adelpha fessonia Hew., Kirby (1871); *Limenitis fessonia* Hew., Scott (1986); *Adelpha fessonia* Hew., DeVries (1987)

Identification, taxonomy and variation:

Adelpha fessonia fessonia is distinguished from *A. f. ernestoi* under that subspecies, and from *A. f. cestus* by the much narrower white postdiscal bands, the broader orange DFW subapical marking, and by lacking any reddish-brown scaling in the DFW or DHW discal cell distal of the basal streak. Several other *Adelpha* species are also superficially similar, but *A. fessonia* may be distinguished by the unbroken white DFW postdiscal band. There is substantial individual, or possibly seasonally induced, variation in the width of the white postdiscal band, which may be as little as half the width of the syntype specimen. All of the specimens reared by Bosese in Texas, USA, have a much darker ventral surface than typical, but it is not clear whether this is due to seasonal effects or not (see comments under *A. f. cestus* and *A. f. lapitha*).

Hewitson (1847) described this species from an unspecified number of specimens from Honduras in the British Museum, and the syntype female in the BMNH(T) closely matches his original figure.

Range: Extreme southwestern USA (Texas) to western Panama. Although most authors report this species to be a "stray" in Texas, it clearly breeds there (see Hostplant below).

Immature stages: Scott (1986) reports this species in Texas on *Celtis lindheimeri* (Ulmaceae), and Neck (1996) repeated this record and added *Celtis laevigata*. However, both state that the early stages are unknown, suggesting that these are oviposition records. Since *Celtis* is the foodplant of the superficially similar *Doxocopa pavon* and *Doxocopa laure*, both of which also occur in Texas, and neither *Celtis* nor Ulmacaeae have otherwise been recorded for *A. fessonia* throughout the remainder of its range, I regard these records as highly dubious.

Janzen & Hallwachs (2000) have reared this species numerous times in Costa Rica, and provide a colour photograph of the fifth instar larva. The head capsule has dark and light patterning, forming vaguely vertical linear markings, and the chalazae are relatively short (Fig. 9). Like many other species, the pits covering the surface of the head capsule are also dark in colour. The body is a pinkish brown in colour, with darker, inclined lateral stripes on most segments, with these being greenish at least on A1-A3. The dorsal surface of A4 and A5 dark green-brown, forming a "saddle" marking. There are well-developed subdorsal scoli on segments T2, T3, A2, A7 and A8, which are thick with dense, short, thick lateral spines, while scoli on A3-A6 are much shorter, with 3-4 terminal spines only. Subspiracular scoli appear to be relatively well-developed, and are greenish in colour with paler reddish brown tips to the accessory spines. Although slightly unclear from the photograph, the principal subdorsal scoli, particularly on A2 and A7, appear to be on raised bases, similar to *A. cytherea* and *A. viola* (Fig. 6c,i). Ronald Boender (pers. comm.) reared an *Adelpha* species on *Randia aculeata* near San José, Costa Rica, that was most probably *A. fessonia* - unfortunately the adult failed to emerge. I am grateful to him for loaning me colour slides of various early stages, which are described here. Early instars have much reduced scoli throughout, are darker in colour and have a conspicuous pale dorsal marking on A5 and A6. Later instars are bright greenish laterally in the middle of each segment, with pinkish brown colouring between segments, and dark brown subdorsal scoli. The swollen bases of the scoli on A2 are also dark brown. The head capsule is mottled buff and dark brown, and chalaza a1 is green, m1 is dark brown, and other medial chalaza also appear to be green. The body colours pale in the prepupa, while the pupa is a mottled dark brown, strongly resembling a dead, curled leaf. The thoracic projection is not so pronounced as in the figured specimen (Fig. 12), and is more rounded.

Late instar larvae in Costa Rica are solitary and feed on all leaves of plants along forest or river edges and in forest light gaps (Janzen, *In*: DeVries, 1986). There is a series of 6 males and 9 females in the FSCA, reared by R. W. Bosese in Texas, USA, all with the pupal case and some with the head capsule of the last instar larva. All were reared from eggs collected on November 12 1994, and the total development times in days (to adult eclosion) are as follows: 43 (1♂, 1♀), 44 (1♂), 46 (1♂), 47 (1♀), 50 (1♀), 52 (1♂, 2♀), 55 (1♂, 2♀), 56 (1♂), 58 (2♀).

Habitat and adult ecology: This is a common species throughout most of its range in deciduous forest habitats, occurring only rarely in rain forest at the western edge of its range (DeVries, 1987; de la Maza & de la Maza, 1993). The species has been reported in Chiapas, Mexico, from sea level to 1500m in deciduous forest (de la Maza & de la Maza, 1993), and from premontane forest further north in San Luís Potosí at 1200m, where it is rare and has been recorded only in October (de la Maza & de la Maza, 1988). DeVries (1987) reports that the species occurs in Costa Rica from sea level to 900m on the Pacific slope of the country, particularly in the lowlands of Guanacaste. Although it flies throughout the year, it is most common in the wet season and in reproductive diapause during the dry season. Both sexes feed at flowers of *Cordia* and *Croton*, and may be attracted to rotting fruits.

Specimens examined (160♂, 118♀):

USA (10♂, 13♀): *New Mexico*: no specific locality 1♂ AMNH; *Texas*: Bentsen-Rio Grande Valley State Park Hidalgo Co. Jun. 1♂ FSCA; Brownsville Aug. 1♂ AME; Granjeno Hidalgo Co. Sep. 2♀ FSCA; Madero Hidalgo Co. Dec. Jan. 6♂, 9♀ FSCA; Pharr May 1♂ AMNH; McAllen Hidalgo Co. Oct. 1♀ FSCA; Santa Ana Res. Hidalgo Co. 1♀ FSCA. **MEXICO** (99♂, 56♀): *Campeche*: Campeche 1♂ AMNH; *Chiapas*: Cañon el Sumidero Jun. 1♂ MUSM; Cuauhtémoc Oct. 1♂ AME; Las Delicias Jun. 1♂ AMNH; Malpaso, km 25 to, 1♂ AMNH; Ocozocoautla Jan. 1♂ AMNH; Rancho Santa Ana 1♂ AMNH; San Quintín Sep. 1♂ AME; Tonalá Jan. 1♂ AMNH; *Colima*: Colima 2♂, 1♀ AMNH, 1♂ BMNH; Comalá 2100' May 1♀ AME; *Guerrero*: Acapulco Dec. 1♀ AMNH; Ayutla-Tierra Colorada 350m Jul. 1♂ BMNH; El Playón Sep. 1♀ AME; Zihuatenejo Apr. 2♂, 2♀ AMNH; no specific locality 2♂, 1♀ BMNH; *Jalisco*: Chamela Bay Mar. Nov. 4♂, 1♀ AMNH; Guadalajara Nov. 4♂ BMNH; Puerto Vallarta Oct. 1♂ USNM; Tenacatitla Bay Apr. 1♀ AMNH; *Michoacán*: Coahuayana Jul. 2♂, 1♀ AME; Playa Azul Dec. 1♀ AMNH; *Nayarit*: Lag. María del Oro 670m Aug. 1♂ AME; Playa Noverillos Jun. 1♂, 2♀ AMNH; Tepic 210m Aug. 1♂ BMNH, 3♂, 1♀ AME; Zapata 900m Aug. 1♀ AME; *Oaxaca*: Oaxaca 1♀ BMNH; Oaxaca, 192 km from, Dec. 1♂ AMNH; Tapantepec 150m Feb. 1♀ AME; *San Luís Potosí*: El Pujal 1♀ AMNH; Valles 1♂ AMNH; 3 mi. N. Ciudad Valles 1♀ FSCA; *Sinaloa*: Concordia 200m Aug. 1♀ AME; El Dorado Sep. 1♂ AMNH; Mazatlán 30m Aug.-Oct. 10♂, 1♀ AME, 2♀ AMNH; Santa Cruz 1♂ AMNH; no specific locality 4♂ USNM; *Tamaulipas*: Ciudad Victoria Jan. Oct. 2♂ USNM, 1♂ AME; El Limón Mar. 1♂ USNM; Mante, 30 mi. N., Nov. 1♂ USNM; San Fernando 60m 2♂ AME; Tampico Dec. 1♂ AMNH; Victoria, 60 mi. S., Jul. 2♂ AMNH; *Veracruz*: Córdoba Jun. Jul. 1♀ BMB; Fortín 1♂ ZMHU; Jalapa 4000' Nov. 3♀ AMNH, 1♂ BMNH, 1♂, 1♀ USNM, 1♀ BMB, 1♀ MCZ; Nuevo Morelos Nov. 1♂ AME; Orizaba 1♀ BMNH; Palmas Reales Jun. 1♀ AMNH; Palo Gaucho Oct. 1♀ AMNH; Paso San Juan 1♀ USNM; Presidio Aug. 1♀ AMNH, 1♀ BMNH; Tezonapa Jun. 1♂, 1♀ AME; Vera Cruz 1♂ ZMHU; *Yucatán*: Acanceh Jul. 1♂ AMNH; Chichen Itza Jul. 3♀ AMNH; Chuminopolis Jul. 1♂ AMNH; Halacal Sep. 1♀ AME; Mérida Jul. Aug. 1♀ AME, 1♀ AMNH; Pisté Jul.-Sep. 10♂, 1♀ AMNH, 1♂ BMNH, 9♂, 3♀ AME, 3♂, 1♀ USNM, 1♀ BMB; no specific locality 1♂, 1♀ ZMHU, 1♂ USNM, 1♀ BMB; *Not located*: W. Mexico 1♀ BMNH; no specific locality 2♂, 2♀ BMNH, 1♂, 1♀ USNM, 1♂ MCZ, 1♀ AMNH. **GUATEMALA** (20♂, 11♀): *Chiquimula*: Chiquimula 1♂ MNHN; *El Progreso*: Motagua Valley 1♂ BMNH; *Escuintla*: Escuintla Jul. Aug. 1♀ USNM, 3♂, 1♀ BMB; Palín Jul. Aug. 2♂, 2♀ BMB; *Quezaltenango*: Volcán Santa María 1♂ BMNH; *Retalhuleu*: San Sebastián 1♂, 2♀ USNM; *Santa Rosa*: Chiquimulilla Jul. 3♂ BMNH; Guazacapán Jun. Dec. 6♂, 2♀ BMNH, 3♀ AME, 1♂ BMB; *Zacapa*: Gualán Jan. 1♂ USNM. **EL SALVADOR** (6♂, 7♀): *La Libertad*: La Libertad 10m Jan. 1♂, 2♀ AME; *San Salvador*: Apopa 2000' Sep. 1♂, 1♀ BMNH, 1♂ BMB; San Salvador Jan. 1♂, 1♀ AME, 1♂ MNHN; Santa Tecla 900m Oct. 2♀ AME; Zaragoza Jan. 1♀ AMNH; *Not located*: Mina San Juan 600m Mar. 1♂ AME. **HONDURAS** (3♀): *Cortés*: San Pedro Sula 2♀ BMNH; *Not located*: no specific locality 1♀ BMNH. **NICARAGUA** (4♂, 6♀): *Chontales*: Chontales 1♀ BMNH; *Managua*: Managua Dec. 1♀ AME; *Matagalpa*: Matagalpa 1♂ BMNH; *Not located*: no specific locality 3♂, 2♀ BMNH, 2♀ MNHN. **COSTA RICA** (13♂, 14♀): *Alajuela*: San Mateo Oct. 1♀ BMNH; *Cartago*: Irazú 6-7000' 1♂ BMNH; *Guanacaste*: Avangarez Jul. 1♀ BMNH; Cañas, 24 km N.W., on flwrs. of *Cordia* sp. Jun. 1♂ AMNH; Hda. La Pacifica 50m Nov. Jan. 2♂ USNM; Las Cañas Jul. 1♀ AME; Santa Rosa 100m Aug. 1♂, 1♀ KWJH; *San José*: Escazú Jan. 2♂, 1♀ BMNH; San Antonio 3000' Mar. 1♂ BMNH, 3♂ AME; Villa Colón 750-800m Aug. 1♂ AME, 1♀ USNM; *Not located*: no specific locality 1♂, 7♀ BMNH, 1♀ AMNH. **PANAMA** (5♂, 2♀): *Chiriquí*: Armuelles 1♀ AMNH; David 1♂ BMNH; Potrerillos 3600' Jan. 1♀ USNM; *Los Santos*: Los Santos Jan. Dec. 4♂ USNM. **COUNTRY UNKNOWN** (3♂, 6♀): no specific locality 4♀ MCZ, 1♂ BMNH, 1♂, 2♀ USNM, 1♂ BMB.

Additional locality data: **MEXICO**: *Chiapas*: El Chorreadero 700m Jan. (Beutelspacher, 1983); Depresión Central; Estribaciones de los Cuchumatanes; Istmo Seco; Macizo Central (de la Maza & de la Maza, 1993); *Colima*: numerous records (Warren *et al*., 1998); *Quintana Roo*: Carrillo Puerto; Chumpón (de la Maza & Bezaury, 1992); *Jalisco*: numerous records (Vargas *et al*., 1996); *San Luís Potosí*: Sierra de Alvarez 1200m Oct. (de la Maza & de la Maza, 1988); *Tamaulipas*: Antiquo Morelos Jul.; Forlon Sep. (Field, 1940b). **BELIZE**: *Corozal*: Shipstern Nature Reserve (Meerman, 1999).

Adelpha fessonia ernestoi Willmott, **ssp. nov.**

Figs. **49c-e**; *286*

Adelpha cestus Hew., D'Abrera (1987) misid.

Description and diagnosis: FW length of HT: 26mm. Both sexes of this subspecies differ from the nominate as follows: the DFW orange subapical marking is much narrower and does not extend into cell Cu_1-M_3 as a slight "hook" at the outer postdiscal series, there is slight reddish brown scaling in the DFW discal cell between the first and second cell bars (absent in the nominate subspecies), and the DFW white postdiscal band is less angled at vein M_3. *Adelpha f. cestus* is distinguished by having much broader white postdiscal bands, with the postdiscal and submarginal series on the VHW thus closer together.

Types: ***Holotype*** ♂: COLOMBIA: *El César*: "Colombia L. Sapatoza Region, Chiriguana Dist. C. Allen//Brit. Mus. 1925-576"; in the BMNH(M). ***Allotype*** **&**: COLOMBIA: "Nouv. Grenade de Bogotá a Buenaventura Dr. O. Thieme 14 Dec. 77

au 22 Fév. 78//Ex Oberthür Coll. Brit. Mus. 1927-3"; in the BMNH(M). ***Paratypes***: COLOMBIA (2♀): *Cundinamarca*: **1**♀: Finca Guanabana, Fusagasugá 1400m; in the ESM; *El César*: **1**♀: "4 km S.W. of Atánquez 24.VII.1972 1950metres//North Colombia: 1808 Sierra Nevada de Sta. Marta Exped. M.J. Adams & G.I. Bernard//B.M. 1973-106//61.17/72 A/B"; in the BMNH(A&B).

Etymology: This subspecies is named for Ernesto Schmidt-Mumm, for his kindness and hospitality during my visit to Colombia, allowing me to take notes from his collection and for his capture of a paratype which provided an important range extension.

Taxonomy and variation: There is little variation in the few specimens examined. It might be argued that this subspecies represents merely a step in a cline from *A. f. cestus* to *A. f. fessonia*, and indeed it is true that it is intermediate in wing pattern. However, the phenotype appears to be stable over a large area of Colombia and is consistently separated by a phenotypic gap from neighbouring subspecies. The variation discussed within *A. f. cestus* by Neild (1996) is minor compared with the phenotypic differences between that taxon and *A. f. ernestoi*, Venezuelan specimens always having distinctly wider postdiscal bands (A. Neild, pers. comm.). It is apparently isolated from the nominate subspecies by central and eastern Panama, presumably due to an absence of suitable drier forest habitat, while it is also isolated from *A. f. cestus* by the Sierra de Perijá. Further, there appear to be possible differences in elevational preference between this subspecies and *A. f. cestus*.

Range: Colombia, on the western slopes of the Cordillera Oriental, from Fusagasugá north to the foothills of the Sierra Nevada de Santa Marta.

Habitat and adult ecology: There are no published observations on this subspecies in nature, but judging from the number of specimens in collections it is very rare. In contrast to other subspecies, it is only known from montane areas from 1400-1950m.

Specimens examined (1♂, 3♀):

COLOMBIA (1♂, 3♀): *Cundinamarca*: Finca Guanabana, Fusagasugá 1400m 1♀ ESM; *El César*: Atánquez, 4 km S.W., S. N. de Santa Marta 1950m Jul. 1♀ BMNH; L. Sapatoza Region, Chiriguana Dist. 1♂ BMNH; *Not located*: de Bogotá a Buenaventura Dec.-Feb. 1♀ BMNH.

Adelpha fessonia cestus (Hewitson, 1847)

Figs. **49f-h**; *286*

Heterochroa cestus Hewitson (1847: 261, pl. XXI, fig. 7)

TL: Venezuela. **Types**: **BMNH**(T): **ST**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//158//B.M. TYPE No. Rh. 9818 Heterochroa cestus ♀ Hew.//cestus Hewitson//Venezuela//Type//Syntype"; **BMNH**(M): **ST**♀: "Illustrated in the Butterflies of Venezuela, Neild 1996//159//B.M. TYPE No. Rh. 9819 Heterochroa cestus ♀ Hew.//Venezuela Hewitson Coll. Heterochroa cestus. 1.//Cestus W.H.//Paratype" [both examined]

Adelpha cestus Hew., Kirby (1871); *Adelpha fessonia cestus* Hew., Neild (1996)

Identification, taxonomy and variation:

Adelpha f. cestus is distinguished from other subspecies by the very broad white postdiscal bands and reduced orange DFW subapical marking, and from the nominate by having additional reddish scaling in the DFW and DHW discal cells between cell bars one and two, and four and the postcellular bar. There is some variation in the white postdiscal and submarginal series on the ventral surface, in some specimens these being almost absent on the hindwing (Fig. 49f,h), resulting in a much darker appearance similar to *A. f. lapitha*. A similarly darkened ventral surface occurs in the specimens of the nominate subspecies in the FSCA from Texas, and I suggest it is due to seasonal effects, though there are insufficient temporal data to test this theory. According to Neild (1996), the width of the white postdiscal bands varies from west to east, specimens with the broadest bands occurring in the east in Sucre state. I have not seen sufficient specimens in collections to determine whether this variation is purely clinal or subspecific; Neild (1996) mentions specimens in the collection of Benito Gutierrez from Altagracia de Orituco (Guarico) which show variation between the extremes of the eastern and western forms, suggesting a possible blend zone.

Hewitson (1847) described this subspecies based on an unspecified number of specimens in his collection and the British Museum from Venezuela. The original figure closely matches the two syntype females in the BMNH (Fig. 49f), both of which were figured by Neild (1996). A third female specimen of *cestus*, in the BMNH(R), with the label data "Lyra//cestus Hew.//Type//Venezuela, Moritz//Felder Colln.", is not syntype but probably had a type label attached in the belief that it was the type of "lyra", an unpublished manuscript name.

Adelpha f. cestus has been treated by all authors prior to Neild (1996) as a distinct species. However, it has no important wing pattern differences and the genitalia are essentially the same, and *A. f. ernestoi*, described below, forms a phenotypically intermediate subspecies to the nominate subspecies, as noted by Neild (1996).

Range: Venezuela, east and west of the Mérida range, throughout the Cordillera de la Costa to Sucre state. Although Boisduval (1870) refers to this taxon, as *Heterochroa cestus*, as being present in Honduras, this is either a misidentification of *A. f. fessonia*, or *A. s. celerio*, since he refers to Cramer's (1777) figure of *Papilio iphicla* (which is, in fact, *A. serpa diadochus*).

Habitat and adult ecology: This subspecies is rare in collections but apparently not uncommon in the field, flying along tracks in disturbed, semi-deciduous forest, where individuals may visit flowers (Neild, 1996). It has been recorded from sea level to 900m from September to February.

Specimens examined (9♂, 11♀):

VENEZUELA (8♂, 11♀): *Aragua*: El Limón 450m Feb. 2♂ MUSM; *Carabobo*: Puerto Cabello 2♂ ZMHU; *Distrito Federal*: Caracas 3100' Sep. Oct. Feb. 1♂ AME, 1♂ USNM, 5♀ BMB; *Guárico*: Los Morros de Macaira Dec. 700m 1♀ AFEN; *Trujillo*: Trujillo 1♂ AFEN; *Not located*: no specific locality 1♂, 3♀ BMNH, 1♀ MNHN, 1♀ AMNH. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMB.

Additional locality data: **VENEZUELA**: *Apure*; *Sucre* (Neild, 1996).

Adelpha fessonia lapitha Hall, 1929 **stat. nov**.

Figs. **49i,j**; 140c; *286*

Adelpha cestus lapitha Hall (1929: 132, pl. III, fig. 4)

TL: "Colombia"-erroneous. **Types**: **BMNH**(T): **HT**♂: "Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3//Problt.-la forme Colombienne de Fessonia God. Salv. Biolog. pl. 29 fig. 18.19.//Lapitha BD. Colombie//Columb.//Type//Holotype" [examined]

Adelpha lapitha Hall, Schwartz (1989a), Smith *et al*. (1994)

Identification, taxonomy and variation:

Compared to other subspecies, *A. f. lapitha* has a much darker ventral surface (but see discussion below), particularly basal to the postdiscal band, the first cell bar in the VHW discal cell does not continue outside the cell to touch vein $Sc+R_1$, but is separated from that vein by a white streak, the orange DFW subapical marking is darker and closer to the apex, and there is an orange spot in cell $2A\text{-}Cu_2$ distal of the white postdiscal band. Both sexes of *A. f. lapitha* also have prominent reddish scaling between cell bars one and two, and four and the postcellular bar, in the DHW and DFW discal cells. This character is present but less pronounced in *A. f.*

cestus, even less pronounced in *A. f. ernestoi*, and absent in the nominate subspecies. The few specimens examined vary little.

Hall (1929) described this species as a subspecies of *A.* (*fessonia*) *cestus*, presumably on the basis of the similar orange DFW subapical marking and very dark ventral surface which occurs in some individuals of *A. f. cestus*. He supplied a black and white photograph of the dorsal surface of the holotype male, which bears the erroneous locality data of "Colombia". Schwartz (1989a) speculates that Hall himself may have captured the holotype specimen and subsequently mislabelled it, but this is not the case since it arrived in the BMNH from Boisduval's collection, possibly sent along with a number of Central American specimens from which Boisduval (1870) described several new *Adelpha* taxa. The rarity of the species and the false type locality led to its omission from works on the Caribbean fauna (Riley, 1975), and it was thus not until Schwartz (1989a) that the taxon was again reviewed. Schwartz (1989a) placed *A. f. lapitha* as a species distinct from *A.* (*fessonia*) *cestus* and *A. fessonia fessonia*, on the basis of several wing pattern and genitalic characters. However, the comparison between the male genitalia of *A. f. lapitha*, *A. f. fessonia*, *A. abyla* and *A.* "*iphiclus*" *iphimedia* (=*A. iphicleola iphimedia*), is fundamentally flawed by clearly mislabelled genitalia. Schwartz (1989a) claims that the genitalia of *A. abyla* do not differ from *A. f. lapitha*, while those of *A. f. fessonia* bear seven recurved teeth, and those of *A.* "*iphiclus*" are described as having numerous straight teeth and various spines. The description of the genitalia of *A. f. fessonia* clearly indicates that these belong to either *A. abyla* or *A. iphicleola*, neither of which differ in genitalia, while those assigned to *A. abyla* clearly belong in fact to *A. f. fessonia*. I am unable to even guess at what species the genitalia assigned to *A.* "*iphiclus*" belong to, but certainly not to that species. In fact, the male genitalia of *A. f. lapitha* and all mainland *A. fessonia* show no consistent differences. Schwartz (1989a) went on to discuss distinctive wing pattern characters in *A. f. lapitha*, such as the narrow postdiscal band, the lack of VHW postdiscal and submarginal series, the distinctive configuration of the VHW discal cell bars, and the orange submarginal spot in cell 2A-Cu_2 on the DFW. The first two of these characters vary within mainland subspecies, whereas the latter two occur only in this taxon. However, I have examined a specimen of *A. f. cestus* in the AME which has a very dark ventral surface, almost entirely lacking whitish coloration except for the postdiscal band distal of the second discal cell bars, exactly as in *A. f. lapitha*. Furthermore, the inner submarginal series on the VFW in cells M_2-M_1 and M_1-R_5 are faded and diffuse, extending to the subapical marking, as in *A. f. lapitha*, and the inner discal cell bar on the VHW is curved distally in cell Rs-Sc+R_1 to almost run alongside vein Sc+R_1, intermediate between the configuration of this bar in typical *A. f. cestus* and *A. f. lapitha*. The orange spot in the DFW tornus represents the outer postdiscal series, which is variably present in subspecies of other primitive *Adelpha*, such as *A. alala* and *A. corcyra*. I therefore consider all of the wing pattern characters that separate *A. f. lapitha* and mainland *A. fessonia* to be relatively weak, and since all of these taxa are defined by the sharing of a continuous white postdiscal band on the DFW, I place *lapitha* as a subspecies of *A. fessonia* (**stat. nov.**). The shape of the orange DFW subapical marking and reddish scaling in the DFW and DHW discal cells, both primitive states relative to the state in *A. f. fessonia*, suggests that *A. f. lapitha* is most closely related to either *A. f. cestus* or *A. f. ernestoi*, or, more likely, the most plesiomorphic taxon of *A. fessonia*.

Range: The island of Hispaniola, to date known only from the Dominican Republic, with several sites near the Haitian border indicating its almost certain occurrence in that country.

Habitat and adult ecology: According to Schwartz (1989a), this subspecies occurs in a variety of habitats, including pine and mixed pine-hardwood forest, xeric-mesic transitional forest and xeric scrub and *Acacia* forest. It has been recorded almost throughout the year from 180-1900m, although the majority of records are below 600m in the months of June and August. Most individuals have been seen flying along forest edges or feeding on flowers, which attract both sexes, including *Croton barahonensis* (Euphorbiaceae) and *Ageratum conyzoides* (Asteraceae).

Specimens examined (3♂, 2♀):

"**COLOMBIA**" (1♂): no specific locality 1♂ BMNH-error. **DOMINICAN REPUBLIC** (2♂, 2♀): *San Juan*: Vallejuelo, 9 km E., 2000' Aug. Dec. 2♂, 2♀ AME.

Additional locality data: **DOMINICAN REPUBLIC**: *Azua*: Azua, 2.5 km W., 6.6 km N., 183m Jun.; Peralta, 5 km S., 305m May Jun.; *Dajabón*: vic. Restauración 550m Sep.; nr. Villarpando, 30 km N. junction Hwy. 2 and Hwy. 44, 370m Mar.; *Pedernales*: Banano, 1 km S.E., 488m Jun. (sight record); *San Juan*: vic. Pirámide 204 Sierra de Neibe 1900m (Schwartz, 1989a,b).

Adelpha gelania (Godart, [1824])

Figs. **50**; 141; 224; *286*

Identification, taxonomy and variation:

This is a distinctive species which can be confused with no other *Adelpha*. The dorsal surface bears a remarkable resemblance, however, to that of the Asian limenitidine, *Sumalia daraxa* Moore, but the patterns are produced through modification of different wing pattern elements; in *A. gelania* the white spots in cells M_2-M_1 and M_1-R_5 on the DFW are derived from the inner and/or outer postdiscal series, in *S. daraxa* they represent the upper postdiscal band. *Adelpha gelania* is one of the few species in the genus that has white postdiscal series on the DFW, and the absence of many typical pattern elements on the VFW, such as the upper postdiscal band and postdiscal series with the exception of the subapical spots, are distinctive characters. There is geographic variation in the pattern in the DFW discal cell, the orientation of white spots on the DFW, the VHW coloration and the presence of a "tail" at vein Cu_1 on the hindwing, and two allopatric subspecies are recognised.

Adelpha gelania is a primitive species within the genus, probably most closely related to *A. fessonia*, with which it shares reddish bands in the DFW discal cell, a third discal cell bar on the VFW, a similar pattern of lines in the cells anterior and posterior of vein 3A on the VHW, a line joining the base of the VFW to the tip of the humeral vein, and similar male genitalia, which lack distal spines on the valvae (Willmott, 1999, in prep.).

Range and status: The islands of Puerto Rico and Hispaniola. In dry and mesic forests up to 1700m. Locally common.

Specimens examined: 51 (24♂, 27♀)

Adelpha gelania gelania (Godart, [1824])

Figs. **50a,b**; 141a,b; 224a,b; *286*

Nymphalis gelania Godart ([1824]: 336, 378)

TL: "Amérique équinoxiale" [Hispaniola]. **Types**: **MNHN**?: **ST**: [not located]

Heterochroa gelania Godt., Westwood (1850); *Adelpha gelania* Godt., Kirby (1871)

Identification, taxonomy and variation:

Adelpha g. gelania is distinguished from *A. g. arecosa* by having, on the DFW, reddish scaling which fills only the anterior half of the space between the first and second discal cell bars, reddish scaling over the DFW discocellulars, and more evenly spaced white subapical spots in cells M_3-R_5. On the DHW, the orange marking in the tornus is less extensive, not extending into cell Cu_2-Cu_1, there is no pronounced "tail" at vein Cu_1, on the VHW the outer postdiscal series is completely absent, and on the VFW the whitish scaling in cell M_1-R_5 is more extensive than the corresponding spot on the DFW. There is little variation.

Godart ([1824]) described this species based on an unspecified number of specimens from "Amérique équinoxiale". I have been unable to locate with confidence any syntype specimens in the MNHN, the only specimen in that collection of this taxon is a clearly ancient female specimen with a handwritten label "H. Gelania, God." and a modern label "Museum Paris, Méxique". However, the original description, in Latin and French, is sufficiently detailed to unambiguously recognise this distinctive taxon. In particular, the French description mentions three reddish-brown marks at the base of the DFW, corresponding to the bands in the discal cell, whereas *A. g. arecosa* has only two such marks. At the time, the Dominican Republic was a French colony, whereas Puerto Rico was Portugese, and therefore the former was the only plausible locality within the range of this species where the type the specimen(s) could have originated (G. Lamas, pers. comm.). Lucas (1835: pl. 68) figured this taxon shortly after its description and there has never been any doubt as to its identity.

Range: The island of Hispaniola.

Habitat and adult ecology: Schwartz (1989b) reports that this species is locally not uncommon in the Dominican Republic but rare in Haiti. It is most commonly encountered in mesic deciduous forests at high elevations, but it also occurs in dense xeric forests in the lowlands and occurs in both pine and mixed pine-hardwood forests. It has been recorded from near sea level to 1700m and flies throughout the year, though it is most abundant in July and August. Individuals have been observed from 7.30am-4.00pm, and typically rest or perch in trees 3-4m above the ground. Two specimens, presumably males, were recorded puddling on rocks in a stream bed. Smith *et al*. (1994) report that individuals typically fly along paths near the forest edge, usually within 2m of the ground, with alternating periods of wing beating and gliding. They suggest that the dorsal wing pattern renders the butterfly inconspicuous when flying in sun dappled areas. Alternatively, the distinctive dorsal wing pattern may be due to mimicry with the Caribbean endemic apaturine *Doxocopa thoe* (Godart, [1824]), which has a similar dorsal pattern that is unique within its own genus; the two species fly together in the Dominican Republic (Smith *et al*., 1994). *Adelpha gelania* has apparently never been observed to feed at flowers or at any other organic material.

Specimens examined (23♂, 17♀):

DOMINICAN REPUBLIC (13♂, 15♀): *Distrito Nacional*: Sto. Domingo 1♂, 1♀ BMNH; *La Altagracia*: Isla Saona, San Domingo Jan. 1♀ MCZ; *La Vega*: Jarabacoa, 19 km S., 3675' Jun. Sep. 2♀ FSCA; *Pedernales*: Aceitillar 1130m Jul. 9♂, 8♀ AMNH; Las Abejas 1160-1250m Jun. Jul. 1♂, 3♀ AME; *San Juan*: Pico Duarte 3800' Apr. 1♂ KWJH; *Not located*: Chacquay Feb. 1♂ AMNH. **HAITI** (10♂, 1♀): *Ouest*: La Visite & vic. La Selle Range Sep. 1♂ MCZ; Port-au-Prince 1♂ BMNH, 1♂ MCZ; no specific locality 6♂, 1♀ BMNH, 1♂ MCZ. "**MEXICO**" (1♀): no specific locality 1♀ MNHN-error.

Additional locality data: **DOMINICAN REPUBLIC**: numerous records in Schwartz (1989b); *La Altagracia*: nr. Playa Bavaro; *La Vega*: woodland above and west of Constanza (Smith *et al*., 1994). **HAITI**: *Not located*: Forêt de Pins, 4 km N.W., 1500m (Schwartz, 1989b).

Adelpha gelania arecosa (Hewitson, 1847)

Figs. **50c,d**; *286*

Heterochroa arecosa Hewitson (1847: 263, pl. XXI, fig. 12)

TL: "Mexico"-erroneous; West Indies. **Types**: **BMNH**(T): **ST**♀: "Hewitson Coll. 79-69 Heterochroa gelania. 1.//B.M. TYPE No. Rh. 9834 Heterochroa arecosa ♀ Hew.//arecosa W.H.//Syntype//Type" [examined]

=*Heterochroa gelania* Godt., Westwood (1850); =*Adelpha gelania* Godt., Kirby (1871); *Adelpha gelania arecosa* Hew., Fruhstorfer (1915); *Adelpha arecosa* Hew., Brown & Heineman (1972); *Adelpha gelania arecosa* Smith *et al*. (1994)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account. There is little variation.

Hewitson (1847) described this taxon from specimens in his own collection from Mexico and the West Indies, and the syntype female in the BMNH closely matches the original figure. It seems he was unaware of Godart's *gelania*, as he did not mention the name in the original description. Soon after, Westwood (1850) placed the name as a synonym of *A. gelania*, until Fruhstorfer (1915) resurrected it and treated it as a subspecies. Ironically, later workers often regarded the taxon as a distinct species (Brown & Heineman, 1972; Schwartz, 1989a,b), until Smith *et al.* (1994) again relegated it to subspecific rank. Despite the differences mentioned in the account above that distinguish the two taxa, I believe they are best regarded as subspecies. They are clearly sister taxa sharing a large number of derived wing pattern and female genitalic characters, and have no important wing pattern or genitalic differences. They also occupy similar habitats.

Range: The island of Puerto Rico.

Habitat and adult ecology: According to Smith *et al.* (1994), this subspecies is common in the coastal Cambalache Forest Reserve near Arecibo, and in the highlands of Maricao and Toro Negro to over 1000m. Individuals may be encountered along roadsides and forested paths, and show territorial behaviour. It appears to fly throughout the year.

Specimens examined (11♂, 10♀):

PUERTO RICO (11♂, 8♀): Cambalache 150m Aug. 1♀ AME; Enseñada Jul. 1♀ AMNH; Guajataca 400m Mar. Sep. Nov. 2♀ FSCA, 3♂, 1♀ AME, 1♂ AMNH; Maricao 2500' Aug. 1♂ AME, 1♀ AMNH; Mt. Brittan Jan. 1♀ AMNH; San Juan Jul. 1♀ AMNH; Toro Negro 3000' Aug. 4♂ AME; no specific locality 1♂ BMNH, 1♂ ZMHU. **COUNTRY UNKNOWN** (2♀): Valera Ex Musaeo Dris. Boisduval 1♀ BMNH; no specific locality 1♀ BMNH.

Adelpha calliphane Fruhstorfer, 1915

Figs. **51a,b**; 142a,b; 225a,b; *287*

Adelpha calliphane Fruhstorfer (1915: 526; 1916, pl. 109b, missp. as *calliphana*)

TL: Rio de Janeiro, Brazil. **OTL**: Rio de Janeiro, São Paulo [Brazil]; Paraguay. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//calliphane Fruhst.//Brasilien Rio Fruhstorfer//TYPE//Type//Syntype" [examined]; **PLT**♀: "Fruhstorfer Coll. B.M. 1937-285//Brasilien Rio Fruhstorfer//TYPE//Type" [examined] = *A. poltius*; **BMNH**(M): **PLT**?♂: "São Paulo Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285"; **PLT**?♂: "Brasilien São Paulo Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285"; **BMNH**(R): **PLT**♂: "Yhú, Paraguay XII.96 (Ander)//calliphane Fruhst." [all examined]

Adelpha gavina Fruhst., Brown (1992) misid.

Identification, taxonomy and variation:

This species is distinguished from the majority of similar species by having a continuous postdiscal band on the VFW, the lower portion of which is white, the upper portion pale grey. *Adelpha poltius* also has a similar band, but differs in the orange-brown VFW subapical marking being of more even width, with the basal edge notably curved in cells M_3-R_5 so that it is much nearer the upper postdiscal band in cell M_3-M_2 than M_2-M_1, in having reduced postdiscal and submarginal series on the ventral surface, and in having a thin, dark brown line immediately bordering the distal edge of the white postdiscal band on the VHW, instead of a broader, red-brown line. There is little variation in the small series examined.

Fruhstorfer (1915) described this species based on the male and a female, the latter from Rio de Janeiro, stated the range to be Rio de Janeiro to São Paulo, and also mentioned two males from Paraguay in the Tring Museum (now the BMNH(R)). The description is uncharacteristically detailed and mentions the continuous postdiscal band on the VFW, which characterises this species and *A. poltius*, and the dorsal surface of the species was figured on plate 109b (Fruhstorfer, 1916). The syntype male specimen in the BMNH(T) (Fig. 51a,b) closely matches the figure, which shows the anteriorly broadening DFW orange subapical marking with the straight basal edge that distinguishes the species from *A. poltius*. Furthermore, Fruhstorfer's (1915) description of the male genitalia clearly refer to those of *A. calliphane*. However, Fruhstorfer also failed to note the distinctness of *A. poltius*, since the syntype female mentioned in the original description is actually that species. The only other Fruhstorfer specimens of this species in the BMNH(M) are two males from São Paulo, and they are almost certainly syntypes, while only a single male in the BMNH(R) from Paraguay bears a label indicating it to be a probable syntype. Fruhstorfer most probably regarded the syntype male in the BMNH(T) as his "Type", and it appears to be this specimen that was illustrated, but since there is some doubt and the syntype female belongs to a different species, I designate the former specimen as the lectotype of *Adelpha calliphane*, with the following label data: "Fruhstorfer Coll. B.M. 1937-285//calliphane Fruhst.//Brasilien Rio Fruhstorfer//TYPE//Type// Syntype".

This species belongs to a group that includes several southeast Brazilian species, including *A. poltius*, *A. falcipennis* and *A. gavina*, among which the shared possession of a continuous VFW postdiscal band suggests a close relationship with *A. poltius*.

Range: Southeastern Brazil to northern Argentina and Paraguay, and probably Uruguay.

Habitat and adult ecology: This species is relatively uncommon in collections, particularly females, and has been recorded from around 200m (Iguaçu) up to 1400m throughout the year. Ebert (1969) reports it to be not uncommon to common in both secondary and primary forest in Minas Gerais, while Brown (1992, as *gavina*) reports it as being rare in open forest to areas of extensive secondary growth in the Serra do Japi, São Paulo, Brazil. Hoffmann (1936) reported it to feed on flowers of Asteraceae in Santa Catharina, Brazil.

Specimens examined: 53 (50♂, 3♀)

BRAZIL (30♂, 3♀): *Minas Gerais*: Passa Quatro 1000m Dec. 1♂ BMNH, 1♂ BMB, 2♂ MNHN; *Paraná*: Castro 1♂ BMNH; Caviúna 1♂ AMNH; Iguaçu Jan. Feb. 3♂ BMNH; N. Paraná 2♂ AMNH; Ponta Grossa 3500' Dec. 1♀ BMB; no specific locality 1♂ AMNH; *Rio de Janeiro*: P.N. Itatiatia 800m May 1♂ USNM; Rio 1♂ BMNH; *Rio Grande do Sul*: Guaraní 1♂ MCZ; *Santa Catharina*: Rio Vermelho 1♀ AMNH; no specific locality 1♀ ZMHU, 1♂ BMB; *São Paulo*: Casa Branca 7♂ ZMHU; São Paulo 2300' 4♂ BMNH, 1♂ AMNH; *Not located*: no specific locality 1♂ BMNH, 1♂ BMB. **PARAGUAY** (19♂): *Caaguazu*: Yhú Dec. 1♂ BMNH; *Central*: Asunción 1♂ MNHN; *Guaíra*: Colonia Independencia Aug. Sep. 2♂ AME; *Misiones*: no specific locality Oct. Nov. 1♂ BMNH; *Paraguarí*: Sapucay Jul. Sep. Oct. 6♂ BMNH, 3♂ BMB; *San Pedro*: Nueva Germania 1♂ BMB; *Not located*: Central Paraguay 1♂ BMNH; no specific locality 3♂ BMNH. **ARGENTINA** (1♂): *Misiones*: no specific locality Apr. 1♂ BMNH.

Additional locality data: **BRAZIL**: *Minas Gerais*: nr. Poços de Caldas 1000-1400m Jan. Feb. Apr. May (Ebert, 1969); *Santa Catharina*: Jaraguá Apr. (Hoffmann, 1936); *São Paulo*: Serra do Japi (Brown, 1992).

Adelpha poltius Hall, 1938

Figs. **52a,b**; 143a,b; 226a,b; *288*

Adelpha poltius Hall (1938: 258)

TL: Minas Geraes [Brazil]. **Types**: **BMNH**(M): **HT**♂: "Minas Geraes. Brazil. Bates Coll.//♂//Minas Geraes ♂//Holotype//Adelpha abia Hew. Godman-Salvin. Coll. 1916.-4.//Holotype male Adelpha poltius Hall G. Lamas det. 1987"; **PT**♂: "Minas Geraes. Brazil. Bates Coll.//♂//Adelpha abia Hew. Godman-Salvin. Coll. 1916.-4.//Minas Geraes ♂//Paratype"; **PT**♂: "Minas Geraes. Brazil. Bates Coll.//♂//Adelpha abia Hew. Godman-Salvin. Coll. 1916.-4.//Minas Geraes ♂//Paratype//not in B.M.//ex coll Saunders"; **PT**♂: "Rio. Hewitson Coll. 79-69 Heterochroa 1//Rio//Paratype"; **BMB**: **PT**♂: Barbacena 4000' Oct. [all examined]

Adelpha calliphane Fruhst., Brown (1992) misid.

Identification, taxonomy and variation:

This species is distinguished from all similar species, with the exception of *A. calliphane*, by having a continuous postdiscal band on the VFW. Characters distinguishing it from *A. calliphane* are discussed under that species. There is some variation in the shape of the hindwing, which may be rounded and of similar shape to *A. cocala*, while the orange DFW subapical area may also be broaden slightly towards the costa, but not so much as in *A. calliphane*.

Hall (1938) described this species based on a holotype male (Fig. 52a,b) and four syntypes from Minas Geraes and Rio de Janeiro, and I have examined all of the type series. His description clearly applies to this species, mentioning the diagnostic shape of the orange DFW subapical band, at least as it occurs in the type series. *Adelpha poltius* is probably most closely related to *A. calliphane*, as discussed under that species.

Range: Only known to date from southeastern Brazil, but probably more widespread.

Habitat and adult ecology: This species is rare in collections and most specimens have been collected from 800-1200m. It has been recorded from December to May. Ebert (1969) found it to be not uncommon in Minas Gerais in primary to secondary forest habitats, up to 1400m. Brown (1992, as *calliphane*) also reports that it occurs, in the Serra do Japi, São Paulo, in a very wide range of habitats, from humid lowland forest to forest above 1100m, and also may be found in open fields, gardens and areas of extensive secondary growth.

Specimens examined: 39 (23♂, 16♀)

BRAZIL (23♂, 15♀): "*Amazonas*": Canuma 2♂, 1♀ AMNH-error; *Minas Gerais*: Barbacena 4000' Oct. 1♂ BMB; no specific locality 3♂ BMNH; *Paraná*: Castro 1♀ BMNH, 1♀ USNM; Fernández Pinheiro 2600' Apr. 1♀ BMNH, 1♂, 1♀ AME; São Luiz do Puruna 900m Mar. 1♂ FSCA; *Rio de Janeiro*: Petrópolis Independencia 900m 1♂ AME; Rio 1♂, 1♀ BMNH; *Santa Catharina*: Cauna Apr. 9♂, 6♀ AMNH; Rio Vermelho 3350-3550' Mar. 1♀ FSCA; no specific locality 1♀ MCZ, 4♂, 1♀ AMNH. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ BMNH.

Additional locality data: **BRAZIL**: *Minas Gerais*: nr. Poços de Caldas 1000-1400m Jan.-May Dec. (Ebert, 1969); *São Paulo*: Serra do Japi (Brown, 1992).

Adelpha mythra (Godart, [1824])

Figs. **53a,b**; 144a,b; 227a,b; *289*

Nymphalis mythra Godart ([1824]: 335, 374)

TL: Brazil. **Types**: **MNHN**?: **HT**♂: [not located]

=*Heterochroa zeba* Hewitson (1850: 435, pl. IX, figs. 3, 4)

TL: Rio de Janeiro [Brazil]. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9833 Heterochroa zeba ♂ Hew.//Rio Hewitson Coll. 79-69 Heterochroa mithra 2.//zeba//Type//Syntype" [examined]; **BMNH**(M): **ST**?♂: "Rio R. Hewitson Coll. 79-69 Heterochroa mithra. 1.//Rio R."; **ST**?♀: "Rio R. Hewitson Coll. 79-69 Heterochroa mithra. 3." [all examined]

Heterochroa mythra Godt., Westwood (1850); *Adelpha mythra* Godt., Kirby (1871)

Identification, taxonomy and variation:

This species is readily distinguished from all other similar species by the extensive yellow orange coloration suffusing the ventral surface. It is superficially most similar to *A. cytherea*, but the orange DFW subapical marking does not touch the white postdiscal band, the third discal cell bar is absent on the VFW, the outer submarginal series on the VFW are absent within the broad yellow orange distal marginal border of both wings, and the upper postdiscal band is clearly visible on the VFW as a grey line. There is slight variation in the width of the white postdiscal bands, in particular the marking in cell Cu_1-M_3 on the DFW which may be reduced to a small spot, and in the width of the orange DFW subapical marking.

Godart ([1824]) described this species from a single male from Brazil, the whereabouts of which is unknown. However, the description, which compares the species to *A. cytherea*, is sufficiently detailed for there to be no doubt as to the identity of the species. Godart mentions that the orange DFW marking is large and triangular and completely isolated from the white DFW postdiscal band, that the postdiscal band on the VFW extends to the costa ("jusqu'en haut") and is accompanied by only two white lines, which I believe refer to the pale bands in the VFW discal cell; in *A. cytherea* there are three such bands, since the third discal cell bar divides the pale area between the second and fourth cell bars into two. Godart also mentions that the tornus of the VHW has two black spots, which are absent in *A. cytherea*. The name *zeba* was first introduced by Westwood (1850) as a *nomen nudum*, then described shortly after by Hewitson (1850) based on an unspecified number of specimens in his own collection from Rio de Janeiro. Hewitson noted that the species was close to *A. mythra*, but did not state how it differed, and the detailed and accurate description, plate showing the dorsal surface and syntype in the BMNH (Fig. 53a,b), closely matching the plate, show that *zeba* is a synonym of *mythra*, where it was placed by Kirby (1871). The name *patricia*, listed by Martín *et al.* ([1923]) as a subspecies of *A. mythra* and represented in the BMNH(T) by a specimen from Rio Grande in Brazil, is a *nomen nudum*.

Despite a superficial similarity to *A. cytherea*, this species lacks the third VFW discal cell bar of *A. cytherea* and has the expanded orange DFW subapical marking typical of members of the *A. iphiclus* group. Within this group, its male genitalia are distinctive in having a relatively broad, short clunicula, and the valvae are short with reduced dorsal and ventral medial lobes. The continuous VFW postdiscal band suggests that the species may be most closely related to *A. poltius* and *A. calliphane*. However, recent information on the early stage morphology (Freitas *et al.*, in press) apparently suggests a possible relationship with *A. cocala*.

Range: Eastern Brazil from Bahia south to Rio Grande do Sul, inland to the state of Minas Gerais, and westwards as far as northeastern Argentina and Paraguay. Probably also occurring in Uruguay.

Immature stages: Müller (1886) reared this species and reported the hostplant from Santa Catharina (Brazil). The colouring of the larva seems to be similar to that of *A. iphiclus*, but otherwise little information was given. Müller said that of all the species that he reared, the dorsal projection on segment A2 in the pupa reached a similar scope to *A. lycorias lycorias* only in this species. This is interesting as no other members outside of the morphologically relatively well characterised *A. phylaca* group have been reported with such a pronounced dorsal projection. Recently, Freitas *et al.* (in press) reared this species in São Paulo, Brazil, describing and figuring the last instar and pupa, and confirming this distinctive pupal shape. According to Müller, the pupa also has indistinct dorsal projections in the position of the last instar larval scoli on segments T2, with more pronounced projections on A2-A4. Larval behaviour is apparently typical of the genus (Freitas *et al.*, in press).

Habitat and adult ecology: *Adelpha mythra* is very common in collections and has been recorded from sea level to 1400m. It appears to fly throughout the year, but is most abundant in the early months of the year. Ebert (1969) found it to be common in primary to secondary forest in Minas Gerais. Brown (1992) reports that it flies high along paths and within the forest at the Serra do Japi, São Paulo, Brazil. Hoffmann (1936) reported that he often found individuals at flowers of *Mikania* in Santa Catharina, Brazil.

Specimens examined: 163 (121♂, 42♀)

"**COLOMBIA**" (1♀): no specific locality 1♀ MCZ-error. **BRAZIL** (118♂, 41♀): *Bahia*: Bahia 1♀ BMNH; *Espírito Santo*: Santa Cruz Mar. 1♀ AME; no specific locality 2♂ BMNH; *Minas Gerais*: Passa Quatro 1000m 1♂ BMNH, 1♂ MNHN; *Paraná*: Castro Feb. Apr. 9♂ BMNH, 1♂ USNM; Caviúna May 1♂, 1♀ AMNH; Curitiba Mar. 1♂ FSCA; Iguaçu Oct. Nov. 3♂ BMNH; N. Paraná 2♂, 1♀ AMNH; Ponta Grossa 3500' Dec. 1♂ BMB; São Luiz do Puruna 900m Mar. 4♂ FSCA; Tijucas do Sul 600m Mar. 1♂, 1♀ FSCA, 1♂ USNM; União da Vitória 2000' Dec. Jan. 2♂, 2♀ BMB; *Rio de Janeiro*: Maravalco Jan. 1♂ AMNH; Maromba Jan. May 1♂ AMNH, 1♂, 1♀ MCZ; Nova Friburgo 1♂ BMNH, 1♂ ZMHU; P.N. Itatiatia May 1♂ AMNH; Petrópolis 1000-1500m Jan. Mar. May 7♂ AME, 5♀ USNM; Petrópolis Independencia 900m Jan. 3♂ AME; Rio 1♂ MCZ, 2♂, 1♀ BMNH; Rio R. 1♂ BMNH; Teresópolis Feb. 2♂ USNM, 1♂ BMNH, 1♀ ZMHU; *Rio Grande do Sul*: Northeast 1♂ BMNH; Pelotas Jan.-Jun. 8♂, 8♀ AMNH, 7♂, 5♀ MCZ, 1♂ BMNH, 1♂ AME, 3♂, 1♀ USNM; Rio Grande do Sul 1♂, 2♀ BMNH, 1♀ ZMHU, 1♂ BMB, 1♂, 1♀ MNHN; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 1♂ FSCA; Blumenau 2♂, 2♀ MCZ; Brusque Jul. Dec. 1♂ AMNH, 1♀ AME; Cauna Mar. Apr. 1♂, 1♀ AMNH; Joinville 20-200m Dec. 1♂ MUSM; Rio Garcia 1♀ AMNH; Rio Vermelho 3350-3550' Mar. 7♂, 1♀ FSCA; São Bento do Sul 850m Feb. Mar. 1♂ FSCA, 1♂ AME; no specific locality Oct. 4♂, 1♀ AMNH, 1♀ BMNH, 1♂ ZMHU, 1♂ FSCA, 1♂ AME, 1♂ USNM; *São Paulo*: Alto da Serra Feb. Aug. Dec. 3♂ BMNH, 1♂ MNHN; Casa Branca 1♂ ZMHU; São Paulo 3♂ BMNH, 1♂ MCZ, 1♂ ZMHU, 1♂ USNM; Ypiranga Dec. 1♂ BMNH; no specific locality 2500' Dec. 1♂ BMB; *Not located*: no specific locality 3♂ BMNH, 1♂ MNHN, 1♂ AMNH. **COUNTRY UNKNOWN** (3♂): no specific locality 3♂ BMNH.

Additional locality data: **BRAZIL**: *Minas Gerais*: nr. Poços de Caldas 1000-1400m Jan. Feb. Apr. May Nov. Dec. (Ebert, 1969); *Rio Grande do Sul*: Capão do Leão; Cascata; Monte Bonito; Retiro (Biezanko, 1949); *Santa Catharina*: Jaraguá Jan. Mar. Apr. (Hoffmann, 1936); *São Paulo*: Serra do Japi (Brown, 1992). **PARAGUAY**: *Alto Paraná* (Kochalka *et al.*, 1996). **ARGENTINA**: *Misiones* (Hayward, 1951).

Adelpha basiloides (H. W. Bates, 1865)

Figs. **54a-d**; 119; 145a,b; 228a-c; *290*

Heterochroa basiloides Bates (1865: 332)

TL: Mexico. **Types**: **BMNH**(T): **ST**♀: "B.M. TYPE No. Rh. 9837 Heterochroa basiloides ♀ Bates//B.C.A. Lep. Rhop. Adelpha basiloides Bates Godman-Salvin Coll. 1916.-4.//Type. sp. figured//♀//Mexico Sallé Bates Coll.//♀ Mexico Basiloides Bates//Type H.T." [examined]

=*Heterochroa lydia* Butler (1865b: 398) **stat. rest.**

TL: Honduras. **Types**: **BMNH**(M): **ST**♀: "Syntype ♀ Heterochroa lydia Butler G. Lamas det. 1987//Honduras// Syntype" [examined]

=*Heterochroa lemnia* C. & R. Felder (1867: 417)

TL: Mexico. **Types**: **BMNH**(R): **ST**♂: "Syntype//Felder Colln.//Lemnia n.//Mexico Sallé Type" [examined]

=*Adelpha basiloides* var. *lativittata* Staudinger (1886: 142) **syn. nov.**

TL: Puerto Cabello, Venezuela. **Types**: **ZMHU**: **ST**♂: Puerto Cabello, Hahnel//Origin [examined]

=*Adelpha basiloides caelia* Fruhstorfer (1915: 524) **syn. nov.**

TL: Colombia. **Types**: **BMNH**(T): **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//basiloides caelia Fruhst.//Columbien ex Coll. H. Fruhstorfer//TYPE// Type//Syntype" [examined]

Adelpha basiloides Bates, Kirby (1871); *Adelpha iphicla* var. *lemnia* Fldr., Kirby (1871); *Adelpha iphicla* var. *lydia* Butl., Kirby (1871); *Adelpha iphicla basiloides* Bates, Hall (1938) in part; *Limenitis (Adelpha) basiloides* Bates, Ross (1976); *Adelpha basiloides basiloides* Bates, Neild (1996); *Adelpha basiloides lativittata* Staud., Neild (1996); *Adelpha basiloides caelia* Fruhst., Neild (1996)

Identification, taxonomy and variation:

This species is distinguished from all similar species in having the white DFW postdiscal band terminate at vein M_2, after which it may or may not be followed by separate white postdiscal dashes. There is much variation in the width of the white postdiscal band, the size and number of postdiscal dashes anterior to it and the shape of the orange DFW subapical marking, and this is discussed below.

Bates (1865) described this species based on a female specimen or specimens from Mexico, and correctly noted the character of the white postdiscal band extending to vein M_2 which distinguishes *A. basiloides* from similar species. He also noted that there was a white spot on the DFW in cell M_2-M_1, and this is the case in the syntype female in the BMNH. In December of the same year, nine months after and apparently ignorant of Bates' (1865) description of *A. basiloides*, Butler (1865b) introduced the name *lydia* for a species from Honduras, based on a specimen or specimens in the BMNH, which he stated differed from *A. iphiclus* by having the white DFW postdiscal band extending beyond vein M_3. The long, detailed description clearly applies to *A. basiloides*, another character mentioned being the narrower, red-brown discal bands on the VHW. Butler also mentions "two minute and indistinct white spots" anterior of the upper postdiscal band. The putative syntype female in the BMNH bears no data to indicate its type status, but is the only specimen from Honduras which Butler could have seen. This specimen has a faint, white postdiscal dash in cell M_2-M_1 on the DFW. In any case, there is no doubt as to the identity of *lydia*, but although Godman & Salvin (1884) correctly synonymised it with *A. basiloides*, Fruhstorfer (1915) resurrected the name for no reason, and I here place it back in synonymy (**stat. rest.**). The Felders, in their description of *Heterochroa lemnia*, also appeared unaware of Bates' *basiloides*, although they mentioned Butler's *lydia* as being the most closely related species (Felder & Felder, 1867). They compared an unspecified number of female specimens from Mexico to *A. iphiclus*, and mentioned the more extensive DFW white postdiscal band, the orange DFW subapical spot not extending into cell Cu_1-M_3, and the narrower red-brown VHW discal bands. These characters clearly indicate *lemnia* to be a synonym of *A. basiloides*, where it was placed by Godman & Salvin (1884), and this is confirmed by the syntype (actually a male) in the BMNH (Fig. 54a,b). Staudinger (1886) introduced the name *lativittata* (misspelt *lativitta* by Fruhstorfer (1915)) for specimen(s) from Puerto Cabello in Venezuela, which differed from the nominate in having wider white postdiscal bands. I have examined a syntype male in the ZMHU. Fruhstorfer (1915) subsequently described *caelia* from Colombia, supposedly differing from the nominate in having a smaller orange DFW subapical marking and broader white postdiscal bands. No information was given on the specimen(s) on which the description is based, but neither of these characters are apparent in any examined Colombian specimens, or in the syntype female in the BMNH.

There is substantial variation in this species throughout its range. Most noticeable is the presence or absence of white postdiscal dashes in cells M_2-M_1 and M_1-R_5 on the DFW, which occur often in females from Mexico to Honduras, being particularly pronounced in specimens from Tamaulipas (Mexico), and occasionally in Mexican males. Females without these white dashes, corresponding to *caelia*, occur throughout the range of the species as far north and west as Tabasco in Mexico. The width of the white postdiscal bands is also variable; specimens from Tamaulipas and northwards in Mexico typically have broader bands (Fig. 54a,b), in addition to specimens from northern Venezuela, the latter corresponding to *lativittata*. Specimens from northwestern Ecuador (Fig. 54c,d) have the narrowest bands, in certain specimens the width approaches that in *A. donysa albifilum*, but again the character is variable and some specimens in western Colombia have bands of equal width to Ecuadorian specimens. The orange DFW subapical marking is narrowest in specimens from northwestern Ecuador, and broadest in specimens from Tamaulipas (Mexico), where it also extends into cell M_3-M_2. Some case can be made for treating *lativittata* from north Venezuela and *caelia* from Colombia as subspecies of *A. basiloides* (see Neild, 1996), but my examination of long series of specimens in museums suggests that all of the characters discussed above are locally slightly variable and geographically clinal, and do not allow unambiguous identification of distinct subspecies. I therefore regard *lativittata* and *caelia* as synonyms of *basiloides* (**syn. nov.**).

Forbes (unpublished manuscript) intended to describe specimens from Tamaulipas with the DFW orange extending into cell M_3-M_2 as a new species, occidentis, stating that they differed also in the male genitalia, although I have been unable to find any differences. *Adelpha basiloides* is a member of the *A. iphiclus* group, as defined by the shape of the DFW subapical marking, but although Hall (1938) placed *basiloides* as a subspecies of *A. iphiclus*, the genitalia and wing pattern of the two taxa are clearly distinct and they are sympatric throughout Central America. In fact, *A. basiloides* is most closely related to *A. plesaure*, which replaces it east of the Andes. Both *A. plesaure* and *A. basiloides* share the DFW postdiscal band extending always to vein M_2 (sometimes beyond, in both species), narrower red-brown discal bands on the VHW and similar genitalia and immature stages (Aiello, 1984). However, *A. basiloides* differs from *A. plesaure* in having the inner and outer postdiscal series entirely fused on the VFW, a derived character with respect to other *A. iphiclus* group members, while *A. plesaure* is unique in the *A. iphiclus* group in having the inner postdiscal series fused with the postdiscal band on the forewing. These characters suggest that the two species are best retained as distinct.

Range: Extreme southwestern USA (Texas) throughout Central America to northern Venezuela and western Ecuador, west of the Andes. The species appears to have been only recently recorded in the USA by Neck (1996), since it is not mentioned by either Scott (1986) or Miller and Brown (1981). Neck reports a single specimen from the Rio Grande valley, but he also figures a specimen of this species under the name *A. fessonia* (pl. 43, fig. 193), and it seems unlikely that the supposedly unique specimen would have been photographed in the wild. I have also seen a single specimen in the FSCA, and it may be that this species is actually represented in more American collections but confused with the more common *A. fessonia*.

Immature stages: Aiello (1984) reared this species in Panama and figured the final instar larva and its head capsule (as figs. 2, 4) and the pupa (fig. 6). The egg is typical of the genus and is deposited on the upper surface of the leaf, either at the tip or at a damaged portion. Larval colour depends on the foodplant, being light brown or reddish brown on *Amaioua*, and dark brown on *Alibertia* and *Bertiera*. The third and fourth instars develop a sharply defined, pale, triangular, dorsal "saddle" marking with its base on the posterior portion of segment A4, and its apex at the middle of A6. Otherwise the larva is mottled black and brown, paler posteriorly, with the boundary between the dark and light areas being an oblique, anteriorly descending line from A7 to A4. Late final instars may be tinged with pink or green, especially at the bases of the scoli, and laterally on A4-A6. The scoli vary substantially in form; that on T1 is moderately thick and long with long lateral spines, those on T3 and A7 are long and thin with very short lateral spines, that on A2 is very thick and curved posteriorly with short, thick lateral spines, those on A1, A3-A6 are short, with only a terminal rosette of thin spines, and that on A8 is short and thick with a broad, clubbed tip armed with long spines. Supraspiracular scoli are also well developed, of similar form to the scoli on A3-A6. The head capsule is patterned with darker lines, lacks most setae and has well developed chalazae. The pupa is pearly white with black tipped head horns, which vary in length and curvature (Fig. 119). There are preserved head capsules and pupal cases in the USNM, collected by Small in Panama.

Marquis, Mallet and Janzen (*In*: DeVries, 1986: Costa Rica) report that late instar larvae are solitary and feed on all leaves of plants along forest and river edges or in forest light gaps. According to Aiello (1984), the larva of *A. basiloides* is almost unique among known larvae in consistently constructing a small, curved mass of frass which strongly resembles a larva on the upper surface of the leaf, away from either the leaf edge or the usual mass of frass accumulated at the leaf base. Presumably this serves some protective function. Development times of the various stages are listed by Aiello (1984: table 2), and the total development time varies from 39-48 days. This is longer than other Panamanian species, and in addition, *A. basiloides* sometimes passes through a sixth instar. Six instar larvae were reared from the same batch of eggs as five instar larvae, and on several occasions. All six instar larvae developed on the hostplant *Amaioua*, and although the development time for individuals with six instars is no longer than that for those with five, all individuals were slower to develop on *Amaioua* than on other hostplants (*Alibertia*, *Bertiera*).

Habitat and adult ecology: This is one of the commonest *Adelpha* species in the northern and western parts of its range, becoming progressively rarer towards and in South America. De la Maza & de la Maza (1993) report it from evergreen and deciduous forest in Mexico, from sea level to 1700m, where it flies from April to December. In the Tikal area of Guatemala it has been recorded from primary to secondary growth habitats where it is uncommon (Austin *et al*., 1996), while in Costa Rica the species occurs up to 1000m, in all forest habitats, being most abundant in the wet season in deciduous forest (DeVries, 1987). Both sexes feed on rotting fruits of *Genipa*, *Alibertia* and *Guazuma*, and apparently mammal dung (DeVries, 1987), though this is an unlikely food source for females. Andrés Orellana (pers. comm.) also reports the species to be attracted to fermenting fruits of *Bunchosia cornifolia* (Malpighiaceae) in Panama. The species occurs in association with secondary growth habitats in rain forest, and open areas in dry forest. In western Ecuador I have found the species to be rare, and only occurring in wet rain forest below 300m. All the individuals I have seen have been males perching around the edges of ridge top light gaps in selectively logged primary forest, in the sun, usually around 6-8m high but as low as 3m on occasion. In western Ecuador, individuals typically have much narrower white postdiscal bands than elsewhere in the range of the species, and the occurrence of narrower bands in a number of other *Adelpha* species in western Ecuador, with similar dorsal patterns (*Adelpha iphiclus*, *A. iphicleola*, *A. barnesia*, *A. erotia* form "lerna", *A. serpa* and *A. seriphia*), is strong evidence for mimicry between these species.

Specimens examined: 335 (198♂, 137♀) † - with orange on DFW in cell M_3-M_2 (only applies to specimens in the MCZ, USNM and AMNH).

USA (1♂): *Texas*: Bentsen-Rio Grande Valley State Park, Hidalgo Co. Jun. 1♂ FSCA. **MEXICO** (97♂, 62♀): *Chiapas*: Comitán 2♂ AME; Mapastepec 2♂ USNM; Santa Rosa Aug. 1♂, 1♀ USNM; *Guerrero*: Acahuizotla Aug.-Oct. 4♂ AME; Ayutla-Tierra Colorada 350m Jul. 1♂ BMNH; no specific locality 1♂, 1♀ BMNH; *Jalisco*: Zapotlán Jun. Jul. 1♂ BMB; *Nayarit*: vic. Compostela Jun. 2♂† MCZ; *Nueva León*: Cola de Caballo 610m Sep. 1♂ AME; Hda. Vista Hermosa 1♂ AMNH; Horsetail Falls Aug. 1♂, 1♀ FSCA; Monterrey 2♂ AMNH; *Michoacán*: Coahuayana Jun. Aug. 3♂ AME; *Oaxaca*: Candelaria Loxicha Aug.-Nov. 1♂ FSCA, 5♂, 2♀ AME, 1♂, 1♀ BMB, 2♂†, 2♀† USNM, 4♂, 4♀ AMNH; Chiltepec Jun.-Sep. 3♂ AME, 3♂, 3♀ AMNH; Chimalapa Aug. Sep. 3♂ AME; El Naranjal Chiltepec May 1♀ AMNH; Portillo del Rayón 1♀ AME; San Mateo Yetla May 1♀† USNM; Tapantepec 150m 1♂ AME; Tuxtepec 2♀ USNM; *Quintana Roo*: X-Can Aug. 4♂ AME; *San Luís Potosí*: Ciudad Valles Aug. 1♂ FSCA; El Bañito 1♂, 2♀ AMNH; El Pujal Mar. 1♀ AMNH; El Salto Falls Aug. Oct. Nov. 2♀ FSCA, 1♂ AME, 1♂† USNM; Palitla Apr. 1♂ AME; Quinta Chilla Aug. Dec. 3♀ AMNH; Rancho Santa María Dec. 1♀ AMNH; San Isidro Apr. 1♀ FSCA; Santa Rosa 1♀† USNM; Tamazunchale Aug. 3♂, 3♀ AMNH; Tamazunchale, 11.7 mi. S., Aug. 1♀† USNM; Tamazunchale, 30 mi. N., Aug. 1♂† USNM; Valles 1♂, 1♀ AMNH; *Tabasco*: Allende 3♀ AMNH; Balancán 1♂ AME; La Venta 10m Jan. 1♀ AME; Teapa Feb. 1♂ AMNH; no specific locality 1♀ BMNH; *Tamaulipas*: Ciudad Victoria May 1♀ FSCA; El Limón Mar. 2♂† USNM; Galeana Canyon Oct. 1♂† USNM; Gómez Farías Mar. Oct. 2♂ FSCA, 2♂, 1♀ AME; Mante, 30 mi. N., Nov. 1♂, 1♀ USNM; Río Sabinas Mar. 1♂ MCZ; Tamaguachale Jul. 1♀ AME; Tampico Dec. 1♂ AMNH, 1♂ BMNH; Victoria, 60 mi. S., Jul. 2♂ AMNH; *Veracruz*: Atoyac 1♀ BMNH; Cardel Dec. 1♂ AMNH; Catemaco 1♂ AME; Coatepec Oct. 1♀ AMNH; Córdoba Jun. Jul. 2♂, 2♀ BMNH, 2♂ AMNH, 1♀ BMB; Dos Amates 1♂ AME; El Vigía Aug. 1♂ AME; Jalapa 1♂, 1♀ BMNH, 1♀ USNM, 1♀ AMNH; Misantla 1♀ BMNH; Ojo de Agua 1♀ AMNH; Peso del Toro May 1♀ FSCA; Presidio Jun. 3♂, 1♀ AME; Tecolutla Jul. 1♀ AMNH; *Yucatán*: Pisté Jul.-Sep. 5♂ AME; *Not located*: Cotontepec Jun. 1♂ AME; no specific locality 2♂ AMNH, 1♂, 2♀ BMNH, 1♂, 1♀ AMNH, 1♀ MCZ, 1♂ MNHN. **GUATEMALA** (16♂, 14♀): *Alta Verapaz*: forests of N. Vera Paz 1♀ BMNH; *Baja Verapaz*: San Jerónimo 1♀ BMNH; *El Petén*: Sayaxché Sep. Oct. 4♂, 2♀ AMNH; *Escuintla*: Escuintla 1200' Jul. Aug. 4♂ BMB; *Izabal*: Cayuga 2♂, 2♀ USNM; Puerto Barrios Dec. 3♂, 2♀ BMB; *Quezaltenango*: Volcán Santa María 2♂, 3♀ BMNH; *Retalhuleu*: San Sebastián 1♀ USNM; *Santa Rosa*: Barbarena 1♂ AME; Guazacapán 1♀ AME; *Suchitapéquez*: Mazatenango Jul. Aug. 1♀ BMB. **BELIZE** (5♂): *Cayo*: Camp Sibún 200m Jul. 2♂ AME; *Stann Creek*: Silk Grass Nov. 2♂ FSCA; *Toledo*: Río Grande 1♂ AMNH. **EL SALVADOR** (1♂, 2♀): *La Libertad*: Zaragoza 1♀ AMNH;

Santa Ana: Citalá 800m Oct. 1♂, 1♀ AME. **HONDURAS** (1♂, 6♀): *Cortés*: San Pedro Sula 1♀ BMNH; La Cumbre 1♂ BMNH; *Not located*: no specific locality 2♀ BMNH, 3♀ ZMHU. **NICARAGUA** (4♂): *Chontales*: Chontales 2♂ BMNH; *Zelaya Sur*: Bluefields Dec. 1♂ AMNH; Nueva Guinea Oct. 1♂ AMNH. **COSTA RICA** (6♂, 5♀): *Alajuela*: San Mateo 1♂ USNM; *Guanacaste*: Hda. La Pacifica Jul. 1♂ USNM; *Limón*: Port Limón 2♀ USNM; *San José*: Puriscal 1♀ USNM; *Not located*: no specific locality 2♂ BMNH, 1♂, 1♀ ZMHU, 1♂, 1♀ AMNH. **PANAMA** (24♂, 32♀): *Chiriquí*: Bugaba 800-1500' 1♂ BMNH; Chiriquí 1♀ BMNH, 1♂, 2♀ ZMHU, 1♀ MCZ; Río Tolé 120m Jan. 1♂ USNM; Valle de Chiriquí 25-4000' 1♂, 1♀ BMNH; *Colón*: Colón Jan. 1♂, 1♀ USNM; Fort Sherman Mar. 1♀ FSCA; Gamboa Oct. 1♂ USNM; Matachin 1♂, 1♀ BMNH; Piña 200m Jul. 1♂, 2♀ AME; *Darién*: Río Tuguesa Jul. 1♀ USNM; *Herrera*: Cerro Montuoso 600m Jan. 1♂ USNM; *Panamá*: Arraiján rd. Feb. 2♂ AMNH; Barro Colorado Island Mar. 4♀ AMNH; Cerro Galera Dec. 1♀ USNM; Cerro Jefe 600m Jan. 1♀ USNM; Cocolí Oct. Nov. 3♀ USNM; Farfán Feb. Jun. Jul. Dec. 3♂, 4♀ USNM, 1♂, 1♀ AME; Fort Kobbe Jun. Jul. 3♂, 2♀ USNM; Las Cumbres Oct. 1♂ FSCA; Rodman Jan. 1♀ USNM; *Veraguas*: Calobre 1♂, 1♀ BMNH; *Not located*: Canal area Mar. 1♂ AME; Los Ríos, Canal Zone Mar. 1♂ USNM; Madden Dam 2♂ FSCA; no specific locality 2♀ ZMHU, 1♀ USNM. **COLOMBIA** (23♂, 9♀): *Antioquia*: Crystallina 1100' Jun. Jul. 1♂ BMB; *Cundinamarca*: Bogotá 2♂ BMNH, 2♂ USNM; env. Bogotá 2♂ BMNH; Région du Bogotá 6♂ BMNH; *Magdalena*: F. Unión-F. Mercedes, Río Guachuca, Santa Marta 100m Aug. 1♀ BMNH; *Santander*: El Centro 1♂ AMNH; La Borroscosa 1♀ AMNH; La Danta 1♀ AMNH; La Lechera 1♂ AMNH; La Lindera 1♂ AMNH; *Valle del Cauca*: El Engaño Aug. 1♀ LMC; *Not located*: no specific locality 3♂ AMNH, 2♂, 3♀ MCZ, 1♂, 1♀ BMNH, 1♂ ZMHU, 1♀ AMNH. **VENEZUELA** (7♂, 6♀): *Carabobo*: Puerto Cabello 2♂, 2♀ ZMHU; San Esteban Jul.-Sep. 1♂ BMNH, 1♀ BMB; *Distrito Federal*: Caracas 1♂ BMNH; *Mérida*: Mérida 1♀ BMNH; *Zulia*: Misión El Rosario 50m Jan. 1♂ MUSM; Tres Bocas 200m Jun. 1♀ AFEN; *Not located*: Sinistara del Sur 1♂ AMNH; no specific locality 1♀ BMNH, 1♂ MNHN. **ECUADOR** (7♂): *Esmeraldas*: El Durango 300m Sep. 2♂ KWJH; La Punta, km 44 Lita-San Lorenzo rd. 300m Jun. Aug. 2♂ KWJH; San Lorenzo-Lita rd., km 20, 100m Aug. 1♂ KWJH; *Not located*: no specific locality 2♂ BMNH-error (wide dorsal white bands). "**BRAZIL**" (1♂): no specific locality 1♂ AMNH-error. **COUNTRY UNKNOWN** (2♂, 1♀): no specific locality 1♂† MCZ, 1♀ FSCA, 1♂ AME.

Additional locality data:

MEXICO: *Chiapas*: throughout - see de la Maza & de la Maza (1993); *Colima*: Agua Dulce 600m Oct.; Cerro de la Media Luna; Coquimatlán Sep.; Colima city 500m Nov. (Warren *et al*., 1998); *Guerrero*: Acapulco; La Sabana; *Oaxaca*: Metates; Chacalapilla; *Puebla*: Patla; *Veracruz*: El Vigía (de la Maza, 1987); *Quintana Roo*: Carrillo Puerto; Chumpón; Chunyaxché; Nohbek; Ramonal; Tres Reyes; Tulúm (de la Maza & Bezaury, 1992); *Jalisco*: Boca de Tomatlán Dec.; Chico's Paradise Dec.; La Calera Mar. Nov.; Mismaloya Jan. Mar. Apr. Dec.; Puerto los Mazos Mar. May Jun. Nov.; Puerto Vallarta Apr. Dec. (Vargas *et al*., 1996). **BELIZE**: *Corozal*; *Toledo* (Meerman, 1999).

Adelpha plesaure Hübner, 1823

Figs. 15; **55**; 146; 229; *290*

Identification, taxonomy and variation:

Adelpha plesaure is distinguished from all other species by having the postdiscal series fused to form broad spots in cells M_2-M_1 and M_1-R_5, as in all *A. iphiclus* group members, and the inner postdiscal series fused with the postdiscal band, the latter extending at least as far as vein M_2, but never extending unbroken to the costa. There is geographic variation in the extent of the postdiscal series and postdiscal band on the DFW, and the presence or absence of an orange postdiscal band distal of the white DHW postdiscal band, and four subspecies are recognised, all of which are connected by intergrades.

This is a distinctive species, and except for being inexplicably split into two species by Fruhstorfer (1915), there has never been any confusion over its identity. It is the sister species of *A. basiloides*, with which it is allopatric, and my reasons for retaining the two as distinct species are discussed under *A. basiloides*.

Range and status: Venezuela to Bolivia, Brazil, the Guianas and Trinidad, in lowland rain forest from sea level up to 1450m. Common.

Specimens examined: 443 (253♂, 190♀)

Adelpha plesaure plesaure Hübner, 1823

Figs. **55a,b**; *290*

Adelpha plesaure Hübner (1823a: 11)

TL: Brazil. **Types**: **ZMHU**: **ST**♂: "Brasilien//Origin//Coll. Sommer//Plesaure H.//Syntype" [examined]

=*Adelpha plesaure heredia* Fruhstorfer (1915: 521)

TL: Espírito Santo, Brazil. **OTL**: Bahia, Espírito Santo [Brazil]. **Types**: **BMNH**(M): **LT**♂: "plesaure heredia Fruhst.//Espírito Santo Brasil ex Coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285" [examined]

=*Adelpha plesaure antoniae* Fruhstorfer (1915: 521)

TL: Santa Catharina [Brazil]. **Types**: **BMNH**(T): **ST**♂: "plesaure antoniae Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Brasilien Blumenau Fruhstorfer //TYPE//Type"; **ST**♀: "plesaure antoniae Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Brasilien Blumenau Fruhstorfer//TYPE//Type//Syntype" [both examined]

Heterochroa plesaure Hübn., Westwood (1850); *Adelpha phliassa plesaure* Hübn, Hall (1938); *Limenitis plesaure heredia* Fruhst., Brown & Mielke (1967); *Adelpha plesaure* Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. p. phliassa* by the orange on the DFW only extending as far as the middle of cell Cu_2-Cu_1, instead of broadly bordering or crossing vein Cu_2. Some specimens may have the orange extending as slight scaling to vein Cu_2 along the postdiscal series, but not along the distal edge of the white postdiscal band, and I interpret these specimens as showing intergradation to *A. p. phliassa*, denoting them with an † in the list below of specimens examined. The white at the basal edge of the postdiscal band also extends to almost touch vein Cu_1. Both of these characters are slightly variable, the orange becoming less extensive and the white more so from north to south, with specimens most closely resembling the syntype of *plesaure* originating from São Paulo and Santa Catharina. The ventral surface is also variable, and the basal half may almost entirely lack red-brown coloration in the discal cells, while the outer postdiscal and inner submarginal series may be expanded and almost merged together. These variations however appear to be individual rather than geographic.

Hübner ([1819]) first introduced this name as a *nomen nudum* in a list of species in the genus *Adelpha*, then described it briefly in German in comparison with *A. iphiclus*, based on an unspecified number of specimens collected by Sommer in Brazil (Hübner, 1823a). The colour figure published in the same year by Hübner (1823b: pl. 41, fig. 231, 232) shows the dorsal and ventral surfaces of a male, which closely match the syntype specimen in the ZMHU (Fig. 55a,b), except that the DFW orange extends as slight scaling to touch vein Cu_2 along the inner postdiscal series. In this it closely resembles the syntype male of *antoniae* in the BMNH. Fruhstorfer (1915) described *antoniae* in comparison with another new subspecies, *heredia* (see below), from an unspecified number of specimens from Santa Catharina. I have examined two syntypes in the BMNH(T), and a further male and two females in the BMNH(M) which may also be syntypes, from "Santa Catharina" and "Blumenau". None of these differ substantially from the syntype or original illustration of *A. plesaure*, and Hall (1938) synonymised *antoniae* with the nominate subspecies. Fruhstorfer (1915) stated that *heredia*, based on specimens of an unspecified number and sex from Bahia and Espírito Santo in Brazil, differed from other subspecies in having the DFW white postdiscal band extending as "far as the wing centre", and referred to the figure named erroneously "*A. plesaure*" on pl. 107a (Fruhstorfer, 1913) as representing this subspecies. The figure shows a specimen which is almost identical on the dorsal surface to the syntype specimen of *antoniae*, with the orange terminating in the middle of cell Cu_2-Cu_1 on the DFW, except for slight scaling along the postdiscal series. The specimen in the BMNH(T), which is labelled "Syntype ♂ Adelpha plesaure heredia Fruhstorfer G. Lamas det. 1987//Fruhstorfer Coll. B.M. 1933-131//Brasilien Fruhstorfer//TYPE//Type//Syntype", is probably not a syntype of *heredia*, but in fact is *A. p. phliassa*; the orange on the DFW extends fully to vein Cu_2, but the white postdiscal band extends to the middle of cell Cu_2-Cu_1. One male specimen in the BMNH(M), bearing the following label data: "plesaure heredia Fruhst.//Espírito Santo Brasil ex Coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285", more closely matches the original figure referred to by Fruhstorfer (1915), and I designate it the lectotype of *Adelpha plesaure heredia*. This specimen is slightly intermediate between typical *phliassa* and *plesaure* as discussed above, but I regard it as representing the nominate subspecies. I therefore follow Hall (1938) in treating *heredia* as synonymous with *plesaure*.

Range: Eastern and southeastern Brazil, from Bahia to Santa Catharina.

Immature stages: Müller (1886) reared this subspecies on a rubiaceous plant resembling species of the genus *Bathysa*, in addition to various other species of Rubiaceae, in Santa Catharina, Brazil. The eggs are typical of the genus and are deposited on the upperside of a leaf at the tip. The mature larva is dark in overall colour with a paler "saddle" mark on A4 and A5. The pupa was figured on Taf. 4, fig. 13, and is shining silvery white with long, laterally curving head horns.

Habitat and adult ecology: Hoffmann (1936) states that this subspecies may be found on flowers of various Asteraceae. Brown (1992) reports this subspecies from the Serra do Japi, São Paulo (the figure numbers on the plate have been erroneously transposed between this taxon and *A. cocala caninia*), where it occurs in disturbed forest areas up to 1000m. Judging from specimens in collections it is locally common, and label data indicate that it probably flies throughout the year.

Specimens examined (61♂, 53♀): † - trans to *A. p. phliassa*, postdiscal band on DFW white to vein Cu_1 and/or orange to vein Cu_2.
"**HONDURAS**" (1♀): *Cortés*: San Pedro Sula 1♀† BMNH-error. "**COLOMBIA**" (1♂, 1♀): *Cundinamarca*: Bogotá 1♀ BMNH, 1♂ MCZ-error. **BRAZIL** (60♂, 50♀): *Bahia*: Bahia 1♂† BMNH; Cachimbo 1♀† BMNH; *Espírito Santo*: Itaguassu Sep. 1♂ AME; Linhares 4♂, 4♀ AME; Santa Teresa Apr. 1♂ AME; no specific locality 1♂†, 1♀† BMNH, 1♂ MCZ; *Goiás*: Goyaz 1♂† BMNH; N. Anápolis, Belo Horizonte-Brasília Apr. 7♂ AME; *Mato Grosso*: Burity Jul. 1♀ AME; *Minas Gerais*: Belo Horizonte 3000' Nov. 1♂ BMB; Belo Horizonte-Brasília, km 500, Apr. 1♂ AME; Leitão, km 142 Curvelo May 1♂ USNM; Nova Lima 1♀ AME; Paracatu 1♂ AME; no specific locality 1♀† BMNH; *Pará*: Cuiabá-Santarém, km 1130, Jul. 1♂ AME; *Paraná*: N. Paraná 1♀ AMNH; *Rio de Janeiro*: Corcovado 1♂, 2♀ BMNH; Itabapoana 1♀† BMNH; Laguna de Sacuarema Aug. Sep. 1♂† BMNH; Paineiras May 2♂ USNM; Petrópolis 1♂ USNM; Restinga Jacarepaguá Jul. 4♂, 1♀ AME; Rio de Janeiro Apr. Nov. 6♂(1†), 7♀(3†) BMNH, 1♀ BMB, 1♂, 1♀ AMNH, 1♂ MNHN, 1♂, 2♀ MCZ, 1♂, 1♀ ZMHU, 1♂ USNM, 1♀† MNHN; *Santa Catharina*: Blumenau 1♂, 2♀ BMNH, 2♂ MCZ, 1♀ AMNH, 3♀ ZMHU; Corupá 2♀ AMNH; São Bento do Sul 850m Sep. 1♀ MUSM; no specific locality 1♂, 1♀ BMNH, 1♂ BMB, 1♀ MCZ, 2♀ ZMHU, 1♂, 1♀ USNM; *São Paulo*: Alto da Serra Santos 800m Feb 1♀ BMNH; Anhangahy Dec. 1♂ BMNH; Casa Branca 2♂ ZMHU; São Paulo 2500' Nov. Dec. 2♂, 2♀ MCZ, 1♀ BMB; *Not located*: no specific locality 5♂, 5♀(3†) BMNH, 1♂ ZMHU, 1♂ MNHN. **COUNTRY UNKNOWN** (1♀): "Amazon" 1♀† BMNH-error.

Additional locality data: **BRAZIL**: *Distrito Federal*: Sobradinho Woods 1050-1150m Feb. Aug.; *Goiás*: Rio Maranhão 700m Jun. Aug.; *Minas Gerais*: Paraopeba Estação Florestal de Experimentação 750m Jun.; Paraopeba Woods 750m Feb. Jun. (Brown & Mielke, 1967); *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *Santa Catharina*: Jaraguá Mar. Apr. (Hoffmann, 1936); *São Paulo*: Mata de Santa Genebra, nr. Campinas (Ecoforça, 2000); Parque Estadual Morro do Diabo (Mielke & Casagrande, 1997); Serra do Japi (Brown, 1992).

Adelpha plesaure phliassa (Godart, [1824])

Figs. 15; **55c,d**; 146a,b; *290*

Nymphalis phliassa Godart ([1824]: 373)

TL: French Guiana; Brazil. **Types**: **MNHN**?: **ST**: [not located]

=*Heterochroa euboea* C. & R. Felder (1867: 422)

TL: Surinam. **Types**: **BMNH**(R): **ST**♂: "Surinam Cll. V. Lennep Type//Syntype//Type//H. euboea Felder//euboea n." [examined]

=*Adelpha phliassa implicata* Fruhstorfer (1915: 521)

TL: Peru. **Types**: **BMNH**(T): **ST**♂: "phliassa implicata Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**♂: "Peru H. Fruhstorfer//TYPE//Paratype// Fruhstorfer Coll. B.M. 1937-285" [both examined]

=*Adelpha phliassa bartolme* Fruhstorfer (1915: 521) **syn. nov.**

TL: Mato Grosso [Brazil]. **Types**: **BMNH**(T): **ST**♂: "bartolme Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Mato Grosso H. Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha plesaure cerachates* Fruhstorfer (1915: 521)

TL: Mato Grosso [Brazil]. **Types**: **BMNH**(T): **ST**♂: "plesaure cerachates Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Mato Grosso H. Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha plesaure sirona* Fruhstorfer (1915: 521)

TL: Eastern Bolivia. **Types**: **BMNH**(T): **ST**♂: "plesaure sirona Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Prov. Sara Dept. S. Cruz de la Sierra February 1904 (J. Steinbach)//TYPE//Type//Syntype" [examined]

Heterochroa phliassa Godt., Westwood (1850); =*Adelpha plesaure* Hübn., Kirby (1871); *Adelpha plesaure* var. *euboea* Fldr., Kirby (1871); *Adelpha plesaure phliassa* Godt., D'Abrera (1987); *Adelpha plesaure phliassa* Godt., Neild (1996)

Identification, taxonomy and variation:

Adelpha p. phliassa is rather weakly distinguished from the nominate subspecies by the orange on the DFW extending broadly to vein Cu_2, with no dark brown at the distal edge of the white postdiscal band in this cell. Typically, also, the postdiscal band is only white from the anal margin to vein Cu_2, or is coloured orange throughout. There is much variation in the colour of the postdiscal band in cell 2A-Cu_2, the width of the DHW white postdiscal band, and the ventral surface postdiscal and submarginal series, which may be sharply defined or almost completely merged. The amount of red-brown scaling between cell bars one and two in the VFW and VHW discal cells is also variable, and may be entirely absent.

Godart ([1824]) described *phliassa* based on specimens from French Guiana and Brazil, and the description corresponds well with this species. Part of the French description, translated here, reads: "the upperside of the wings is blackish brown, with a white discoidal band, terminating in a sharp point at the anal angle of the hindwings by a yellow marking, losing itself, towards the internal border of the forewings, in an orange band, transverse and larger, of which the external border is sinuous and the internal border deeply indented towards its origin". I have not been able to locate any type specimens in the MNHN, and there remains the slight possibility that the syntype specimens from Brazil may actually be nominate *A. plesaure*. However, since French Guiana is the first named country in the original description, the description states that the orange band of the DFW begins "towards the internal border of the forewings" as in *phliassa* as treated here, and certain French Guianan specimens have a sinuate distal border of the DFW orange band, being slightly transitional to *A. p. symona*, I follow all previous authors (Fruhstorfer, 1915; Hall, 1938; D'Abrera, 1987; Neild, 1996) in regarding the name as applying to the Guianan subspecies. Felder & Felder (1867) described *euboea* from a male specimen or specimens from Surinam, ex coll. Klinkenberg, in their own collection. They compared it to *A. plesaure*, stating the DFW postdiscal band was narrower, and the syntype specimen in the BMNH shows it to be a synonym of *A. p. phliassa*, where it was placed by Hall (1933). There then followed Fruhstorfer's (1915) inexplicable treatment of this species as two distinct species, *phliassa* and *plesaure*, for which he provided no justification. As subspecies of the former "species", he described two names, *implicata*, based on specimens from Peru, and *bartolme*, based on specimens from Mato Grosso. The characters used to justify these taxa, namely the differing width of the white postdiscal band on the DHW, the overall colour of the ventral surface and the slightly increased white shading within the DFW orange band, are all so slight that they would be insignificant even were they not subject to much individual variation. As subspecies of *A. plesaure*, Fruhstorfer (1915) described *cerachates*, based on specimens from Mato Grosso, and *sirona*, based on specimens from Bolivia, each of these supposedly differing from each other and known subspecies only by the characters listed in the previous sentence. Of all of these, *cerachates* is perhaps the most distinctive, with faded and coalescing postdiscal and submarginal series on the ventral surface, a character often occurring in specimens from drier areas. However, the differences ascribed to all of these taxa, *bartolme*, *implicata*, *cerachates* and *sirona*, fall well within the usual bounds of variation for this subspecies, and since the last three were synonymised by Hall (1938) with *A. p. phliassa*, I here synonymise *bartolme* with that same taxon (**syn. nov.**).

I retain *A. p. phliassa* as distinct from *A. p. plesaure* for the present, although the characters that separate the two are weak and variable, to some extent. More collecting, or examination of series of specimens with more accurate locality data than those to which I have had access, may well show the two to be connected by continuous clinal variation, and therefore *phliassa* will need to be synonymised. Certain specimens from Remolinos, Restrepo and Villavicencio, in Meta, Colombia, have the white postdiscal band on the DHW half the usual width, with more extensive orange on the DFW, and appear to be transitional to *A. p. pseudomalea* from Venezuela.

Range: Southeastern Venezuela to Bolivia, throughout Amazonian Brazil and the Guianas.

Immature stages: Moss (1933) reared this species in Brazil (Pará), and figured both the last instar larva (pl. I, fig. 14) and the pupa (pl. II, fig. 9). In common with the observations of the nominate subspecies by Müller (1886), the larvae are very dark in all instars, the last instar with a few fine white dots, with a lateral oblique stripe of pink and white marking the posterior segments. The scoli are diverse in form, similar to *A. basiloides*, though Moss' illustration shows the scoli on T3 and A7 to be shorter and thicker than in *A. basiloides*. The pupa is pale silvery grey with segments A2 and T2 only weakly dorsally produced, the head horns are long, thin and curved anteriorly (Fig. 15). The larva appears to rest in the Front-Arched-Rear-Up position (Aiello, 1984).

Habitat and adult ecology: This subspecies is common in most lowland forest sites, from primary forest to disturbed forest with much secondary growth, up to 1450m. Males are readily attracted to rotting fish in forest light gaps, and more rarely, banana. In eastern Ecuador I have observed males perching along open ridge top paths through primary and secondary forest, from 2-4m above the ground, in the middle of the day.

Specimens examined (172♂, 117♀): † - trans. to *A. p. plesaure*; ‡ - trans. to *A. p. pseudomalea*; * - trans. to *A. p. symona*.

VENEZUELA (7♂, 9♀): *Amazonas*: Alto Orinoco 1♂ USNM; Isla Ronda Oct. 1♂ AMNH; *Bolívar*: Cuchime, Río Caura Apr. 1♂ MUSM; El Dorado Aug. 1♂ MUSM; Javillal, L. Caura 100m Aug. Sep. 3♀ AFEN; Suapure 1♂, 1♀ MCZ; *Monagas*: Barrancas 2♂ AME; Caripito Jun. 3♀* AMNH; *Not located*: no specific locality 2♀ BMNH. **COLOMBIA** (13♂, 11♀): *Amazonas*: Florida 2♂ BMNH; Leticia Oct. 1♂ ESM; "*Antioquia*": "Río Cocorná, Antioquia, 800-1100m Aug. L. Richter" 1♂ AMNH-error?; *Caquetá*: Montañita Jan. 1♂, 1♀ USNM; Río Bodoquero Jan. 1♂ USNM; *Cauca*: San Juan de Villalobos Sep. 1♂ KWJH ; *Cundinamarca*: Bogotá 2♀ BMNH; *Meta*: Remolinos Apr. Jun. 2♀(1‡) JFL; Restrepo 1♀‡ JFL; San José Guaviare May Jun. 1♂, 1♀ JFL; Villavicencio Jan. Feb. Jun. Aug. 2♂(1‡), 1♀ AME, 1♂, 2♀(1‡) MCZ, 1♀ JFL, 1♂ LMC; *Not located*: no specific locality 1♂ BMB. **ECUADOR** (16♂, 1♀): *Morona-Santiago*: Bomboiza Jul. Nov. 2♂ KWJH, 2♂ DAT; Méndez-Santiago rd., km 40, Nov. 1♂ DAT; 2°-4°S, 78°W 875m Nov. Dec. 1♂ AMNH; *Napo*: Apuya Aug. Oct. 1♂ KWJH, 1♂ DAT; Chichicorrumi Jul. 2♂ KWJH; Coca, 30 km S.W., Apr. 1♂ MJP; Coca, 35 km S.W., Apr. 1♂ MJP; Finca San Carlo Oct. 1♂ DAT; Río Latas 1♂ BMB; *Pastaza*: Puyo Jun. 1♀ FSCA; *Not located*: no specific locality 2♂ JFL. **PERU** (53♂, 11♀): *Huánuco*: Tingo María Jul. 1♂ AME, 1♂ MUSM; *Junín*: Chanchamayo 1♂ BMNH, 1♂ ZMHU, 1♂ USNM, 1♂ BMB; La Merced 1♀ BMNH, 1♂ BMB; Satipo 3♂ AMNH; Río Colorado 2♂ BMNH; *Loreto*: Iquitos Mar. Jul. Aug. 2♂, 1♀ BMNH, 1♂ ZMHU, 1♂ FSCA, 1♂ USNM; Pebas Jan. Oct. Dec. 3♂, 1♀ BMNH, 1♂ ZMHU, 1♂ MCZ; Río Aguas Negras 150m Mar. 1♂ MUSM; Río Sucusari 140m Sep. 3♀ MUSM; San Roque 1♂ AME; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Boca Río la Torre 300m Jul. Sep. Oct. 4♂, 3♀ MUSM; Lagarto, Río Madre de Dios Sep. 1♂ MUSM; Manu Oct. 1♂ AMNH; Pakitza 400m Sep.-Nov. 3♂, 1♀ MUSM; Puerto Maldonado 250m Aug. 1♂ AME; *Puno*: Chaquimayo Apr. 2♂ BMNH; Río Távara Aug. 600-1050m 2♂ MUSM; *San Martín*: Jepelacio 6♂, 1♀ AMNH; Juanjuí 1♂ USNM; Tarapoto 1♂ BMNH; *Ucayali*: Contamana, Río Ucayali 400' Oct.-Dec. 1♂ BMB; *Not located*: Huallaga 2♂ AMNH; no specific locality 2♂ BMNH, 1♂ USNM. **BOLIVIA** (18♂, 1♀): *La Paz*: Caranavi 1200m Feb. 1♂ MUSM; Coroico 2♂ MCZ; Río Songo 1200m 1♂ ZMHU; *Potosí*: Tupiza 1♂ AME; *Santa Cruz*: Buenavista Mar. Aug. Dec. 1♀ BMNH, 3♂ AME; Prov. Sara Feb. Mar. May 4♂ BMNH, 3♂ BMB; Santa Cruz 1♂ BMNH; *Not located*: no specific locality 2♂ AMNH. **BRAZIL** (42♂, 55♀): *Amazonas*: Manaus 1♀ BMNH; Manicoré 1♀ ZMHU; Massaury 1♀ ZMHU; São Paulo de Olivença 1♂, 1♀ ZMHU, 1♂ AME; Serpa Jan.-Mar. 1♀ BMB; Tefé Oct. 2♂ BMNH, 1♂ MCZ; *Maranhão*: Mts. Aureos 2♀ BMNH; *Mato Grosso*: Burity Jul. 1♂ BMNH; Chapada 1♂ BMNH; Cuiabá 1♂ BMNH; Cuiabá-Corumbá river system 3♂ BMNH, 1♂† BMB; no specific locality 2♂ BMNH; *Pará*: Itaituba 1♂ ZMHU; Itaituba-Óbidos Apr. 2♀ BMNH; Óbidos 2♂, 2♀ BMNH, 3♀ AMNH; Óbidos-Serpa 1♀ BMNH; Pará Jan.-Mar. Aug. 14♂, 29♀ BMNH, 1♂* AMNH, 1♀ BMB, 1♀ MNHN; Santarém Jan.-Mar. 1♂, 3♀ BMNH, 1♂ ZMHU, 1♀ BMB; *Rondônia*: Cacaulândia Oct. Nov. 1♀ FSCA, 2♂, 2♀ USNM; *Not located*: São Felippe 2♂ BMNH; no specific locality 3♂, 1♀ BMNH, 1♂, 1♀† MNHN. **GUYANA** (6♀): *Upper Takutu/Upper Essequibo*: Annai, Essequibo 2♀ BMNH; *Not located*: Essequibo R., 140 mi. inland 1♀ BMNH; Sabina, Río Berbice Mar. Apr. 1♀ BMB; no specific locality 2♀ BMNH. **FRENCH GUIANA** (12♂, 13♀): *Cayenne*: Cayenne 2♂, 2♀ BMNH, 1♀ ZMHU, 3♂ MNHN; *Laurent du Maroni*: Maroni River 3♀ AME; St. Laurent du Maroni Jan. May 1♂, 1♀ BMNH; Saül May 1♀ MUSM; *Not located*: no specific locality Jun. 6♂, 3♀ BMNH, 1♀ BMB, 1♀ MNHN. **SURINAM** (3♂, 6♀): *Para*: Bersaba 1♀ ZMHU; Para Dist. Nov. 1♀ BMNH; *Paramaribo*: Paramaribo Oct. Nov. 1♀ BMNH; *Not located*: no specific locality 2♂, 3♀ BMNH, 1♂ ZMHU. **COUNTRY UNKNOWN** (8♂, 4♀): Amazons 2♀ BMNH, 2♂ USNM, 4♂ BMB, 1♂ MCZ; no specific locality 2♀ BMNH, 1♂ MNHN.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Bomboiza May; Taisha Jun.; *Napo*: Apuya Sep.; Capirón Jul.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Sep. Dec.; Finca San Carlo Sep. Dec.; Río Tiputini Jun.; Satzayacu Sep.; Tiputini Biodiversity Station 300m Aug.; Yarina Jul.; Yasuní Aug.; *Pastaza*: Pitirishca Jul.; *Sucumbíos*: Pañacocha 250m Oct.; *Zamora-Chinchipe*: Chachacoma 1250m Nov.; Zamora, ridge west of town 1450m May (Willmott & Hall, sight records). **BRAZIL**: *Amazonas*: Ilha de Maracá (Mielke & Casagrande, [1992]).

Adelpha plesaure symona Kaye, 1925

Figs. **55e,f**; 229a-c; *290*

Adelpha phliassa symona Kaye (1925: 414)

TL: Northern Hills, Tabaquite, Trinidad. **Types**: **AME**: **ST**♀: "Type H.T.//Sta. Cruz, Trinidad, 4.XI.21, R. Dick//phliassa symona Kaye"; **ST**?♀: Tabaquite [examined]

Adelpha plesaure Hübn., Kaye (1904); *Adelpha euboea* Fldr., Kaye (1914) misid.; *Adelpha plesaure symona* Kaye, Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. p. phliassa* by the scalloped distal margin of the DFW orange postdiscal series, which extend right to the anal margin, and the more extensive postdiscal band, which extends as an orange block into cell M_2-M_1, with faint orange scaling anterior cell M_2-M_1. There is slight variation in both of these characters towards typical *A. p. phliassa*.

Kaye (1925) described this subspecies with great alacrity, stating merely that the forewing band was broader. The description was based on several specimens from the Northern Hills, and Tabaquite (Fig. 55e,f), and it is probable that several more of the Trinidadian specimens in the AME are syntypes.

This subspecies may occur in coastal areas of the Guianas, or there may be some gene flow, since certain Guianan specimens have the distal edge of the orange DFW postdiscal series scalloped. This scalloping may be what Godart ([1824]) refers to as "sinuate" in his original description of *phliassa*, though the deep indentation that is mentioned of the basal edge of the forewing band near the costa, confirms that Godart's specimens belonged to *phliassa* as treated here, rather than *symona*.

Range: Extreme eastern Venezuela and Trinidad. Several specimens labelled "Cayenne" in the USNM suggest that this subspecies may also extend along coastal areas of the Guianas, or occasionally disperse there, or it is possible that these are mislabelled.

Habitat and adult ecology: According to Barcant (1970), this subspecies is not rare, especially in the wet season, and it occurs up to 500m.

Specimens examined (18♂, 19♀): † - trans. to *A. p. phliassa*.
TRINIDAD (17♂, 14♀): *Caroni*: Tabaquite Jan. 1♀ AME; *St. George*: Arima District Jan.-Mar. Oct. Dec. 1♀ BMNH, 1♂, 1♀ BMB; Chancellor's rd. 1♂ AMNH; Fondes Amandes 1♂ AME; Hololo 1000' Oct.-Dec. 2♂ AME, 1♂ BMB; Macqueripe Bay Apr. 1♀ BMNH; Maraval Nov. Dec. 1♂ BMB; St. Anns Oct.-Dec. 5♂, 3♀ BMB; Santa Cruz 1♀ AME; Simla Sep. 1♂ FSCA; *St. Patrick*: Siparia Oct.-Dec. 1♀ BMB; *Not located*: no specific locality Jan. 1♂ AME, 4♀ BMNH, 1♂ USNM, 2♂ BMB, 1♀ MNHN. **VENEZUELA** (1♀): *Monagas*: La Pica Oct. 1♀ MUSM. **FRENCH GUIANA** (1♂, 3♀): *Cayenne*: Cayenne 1♂, 3♀(2†) USNM. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ USNM.
Additional locality data: **TRINIDAD**: *St. George*: W. of Diego Martín Morne Pierre 1500' Dec.; Morne Catherine 1500' Jan.; *St. Patrick*: Parrylands Oct. (M. Cock, pers. comm.).

Adelpha plesaure pseudomalea Hall, 1938

Figs. **55g,h**; *290*

Adelpha plesaure pseudomalea Hall (1938: 234)

TL: Muchuchachi, Venezuela. **Types**: **BMNH**(T): **HT**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//101//pseudomalea Hall i.l.//Joicey Bequest Brit. Mus. 1934-120//44. 20 Muchuchachi Venezuela//Holotype" [examined]

Identification, taxonomy and variation:

This subspecies is easily distinguished from all others by the orange scaling distal of the white DHW postdiscal band, and by the latter being considerably narrower than usual. This subspecies is also similar to *A. cytherea nahua*, but may be readily distinguished by the ventral surface pattern. The extent of orange on the DHW is slightly variable in the few specimens I have seen.

Hall (1938) described this subspecies based on a single female in the BMNH, which I have examined (Fig. 55g,h).

Range: Western Venezuela, east of the Mérida range and west of the llanos, south to Meta province in Colombia.

Habitat and adult ecology: This subspecies is very rare in collections and nothing has been reported on its habitat or behaviour. The development of the orange postdiscal band on the DHW produces a remarkable resemblance between this species and the numerous other Venezuelan *Adelpha* that develop a similar character in populations sympatric with this taxon, all of which are presumably involved in mimicry.

Specimens examined (2♂, 1♀):
VENEZUELA (1♂, 1♀): *Mérida*: Mucuchachi 1♀ BMNH; *Táchira*: La Morita 300m Aug. 1♂ MUSM. **COLOMBIA** (1♂): *Meta*: Remolinos Jan. 1♂ JFL.
Additional locality data: **VENEZUELA**: *Barinas*: Reserva Forestal Caparo (Neild, 1996).

Adelpha gavina Fruhstorfer, 1915

Figs. **56a,b**; 147a,b; 230a,b; *291*

Adelpha gavina Fruhstorfer (1915: 529)

TL: Blumenau, Brazil. **OTL**: Rio de Janeiro, Espírito Santo, Blumenau [Brazil]. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//gavina Fruhst.//Brasilen Blumenau Fruhstorfer//TYPE//Type//Syntype"; **PLT**♀: "Fruhstorfer Coll. B.M. 1937-285//gavina Fruhst.//Brasilen Blumenau Fruhstorfer//TYPE//Type"; **BMNH**(M): **PLT**?♂: "Brasilien Fruhstorfer//St. Cath. Sch.//Fruhstorfer Coll. B.M. 1937-285"; **PLT**?♂: "Brasilien Blumenau Fruhstorfer// Fruhstorfer Coll. B.M. 1937-285"; **PLT**?♂: "Brasilien Rio Fruhstorfer// Fruhstorfer Coll. B.M. 1937-285" [all examined]

Adelpha poltius Hall, Brown (1992) misid.

Identification, taxonomy and variation:

This species is distinguished from the similar *A. calliphane* and *A. poltius* by the VFW postdiscal band terminating at vein M_3, after which it consists of pale grey shading in cells M_2-M_1 and M_1-R_5, instead of the prominent whitish dashes seen in *A. thessalia indefecta*. It may also be distinguished from the latter species by lacking the outer submarginal series on the ventral surface, instead having a uniform, orange-brown submarginal border, and by the slightly darker line which runs through the middle of the pale VFW subapical marking being in the middle of the marking, instead of nearer the distal edge, especially noticeable in cell Cu_1-M_3. *Adelpha falcipennis* is also similar, but has a produced hindwing tornus, the inner submarginal series on the ventral surface is clearly defined, the inner postdiscal series on the VHW consists of a uniform, slightly paler orange-brown line near the distal edge of the white postdiscal band, instead of a pale silvery grey line which is thicker in cells M_1-Rs and Rs-Sc+R_1, and the VFW orange-brown marginal border is broader and lacks whitish shading in the apex. *Adelpha epizygis* and *A. abia* have the orange DFW subapical marking touching the white postdiscal spot in cell Cu_1-M_3 on the DFW, or the orange notably reduced. There is little variation in the small series of specimens examined, except for one male in the AME that is an aberrant form, in which the usually orange DFW subapical marking is entirely creamy white, and a single male in the FSCA has the white spot in DFW cell Cu_1-M_3 almost absent.

Fruhstorfer (1915) described this species from two males and four females in his own collection from several Brazilian localities (see TL above). Although the description is rather vague and fails to comment on the most important features of the species, the comparison of the dorsal surface with *A. calliphane*, and the ventral surface with *A. plesaure plesaure*, in addition to the statement that the white postdiscal band on the VFW terminates at vein M_3, seem to apply only to this species. I have been able to locate only one male and one female syntype, and an additional three possible male syntypes, none of which are from Espírito Santo, one of the type localities. Since it is possible that Espírito Santo specimens may prove to belong to another taxon, I designate the male specimen in the BMNH(T) with the following label data as the lectotype of *Adelpha gavina*: "Fruhstorfer Coll. B.M. 1937-285//gavina Fruhst.//Brasilen Blumenau Fruhstorfer//TYPE//Type// Syntype" (Fig. 56a,b).

The precise relationships of this species are not clear, but the VFW white postdiscal band, which is broken at vein M_3, suggests it may be more closely related to *A. falcipennis*, *A. thessalia*, *A. iphiclus*, *A. iphicleola* and *A. abyla*, than to other *A. iphiclus* group members.

Range: Southeastern Brazil, from Rio de Janeiro to Santa Catharina.

Habitat and adult ecology: This species has been recorded from December to March and it is rare in collections. However, unless the species was misidentified, which is very possible, Ebert (1969) reports that it can be locally common in Minas Gerais in high and low canopy primary forest up to 1400m. Brown (1992, as *poltius*) reports that the species occurs in similar habitats to *A. abia*, openings in humid forest from 800m to above 1100m, in the Serra do Japi, São Paulo, Brazil, while other Brazilian records suggests it occurs as low as 200m.

Specimens examined: 33 (16♂, 17♀)

BRAZIL (15♂, 16♀): *Goiás*: Tower 10 km N. Goiânia 850m Mar. 1♂ USNM; *Minas Gerais*: no specific locality 2♀ BMNH; *Paraná*: União da Vitória 2000' Dec. Jan. 1♀ BMB; *Rio de Janeiro*: Petrópolis Independencia 900m 1♂ AME; Rio 1♀ BMNH; *Santa Catharina*: Cauna Mar. 1♂, 3♀ AMNH; Serrinha do Pirai, W. Joinville 950' Mar. 1♂ FSCA; Blumenau 2♂, 1♀ BMNH, 1♂ ZMHU; Joinville 80-200m Dec. 1♂ MUSM; no specific locality 1♂, 3♀ BMNH, 2♀ ZMHU; *São Paulo*: Alto da Serra Aug. 1♂ MNHN; Casa Branca 1♂, 2♀ ZMHU; São Paulo 2♂, 1♀ BMNH, 1♂ AMNH; *Not located*: no specific locality 1♂ BMNH. **COUNTRY UNKNOWN** (1♂, 1♀): no specific locality 1♀ BMNH, 1♂ AME.

Additional locality data: **BRAZIL**: *Espírito Santo* (Fruhstorfer, 1915); *Minas Gerais*: nr. Poços de Caldas 1000-1400m Apr. May Nov. Dec. (Ebert, 1969); *São Paulo*: Serra do Japi 800-1000m (Brown, 1992).

Adelpha falcipennis Fruhstorfer, 1915

Figs. **57a,b**; 148a-c; 231a-d; *292*

Adelpha falcipennis Fruhstorfer (1915: 526)

TL: Rio Grande do Sul [Brazil]. **Types**: **BMNH**(T): **HT**♂: "Fruhstorfer Coll. B.M. 1937-285//falcipennis Fruhst.//Rio Grande Brasil Fruhstorfer//TYPE//Type//Syntype" [examined]; **BMNH**(M): **PT**♂: "falcipennis Fruhst.//Rio Grande Brasil Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285"; 4**PT**?♀: "Rio Grande Brasil Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285" [all examined]

=*Adelpha falcipennis perga* Fruhstorfer (1915: 527) **stat. rest.**

TL: Santa Catharina [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//falcipennis perga Fruhst.//Brasilen Blumenau Fruhstorfer//TYPE//Type//Syntype" [examined]

Adelpha perga Fruhst., D'Abrera (1987)

Identification, taxonomy and variation:

This species is distinguished from similar species by the elongate hindwing tornus, the broad, orange-brown marginal border on the VFW, the clearly defined, silvery grey inner submarginal series, and the VFW white postdiscal band, which is broken at vein M_3. There is a little variation in the specimens examined in the colour of the brownish areas of the ventral surface, which may be tinted red or orange.

Fruhstorfer's (1915) original description of this species is detailed and closely corresponds with the specimen in the BMNH(T). He stated that the "Type" of this species was in his own collection, and I regard the specimen in the BMNH(T), which bears a red TYPE label, as representing the holotype. He also described a new subspecies, *perga*, from an unspecified number of specimens from Santa Catharina, which supposedly differed from the nominate in having narrower orange on the DFW and a more "variegated" hindwing. In fact, the syntype of *perga* in the BMNH (Fig. 57a,b) is simply a fresher, less faded specimen of *A. falcipennis*, and all Fruhstorfer's suggested differences prove to be individual variation. Hall (1938) synonymised *perga* with *falcipennis*, where I also place it (**stat. rest.**), since D'Abrera (1987) resurrected the name with no explanation.

Range: *Adelpha falcipennis* ranges from southeastern Brazil, from Rio de Janeiro to Rio Grande do Sul, to northeastern Argentina and Paraguay. It probably also occurs in Uruguay.

Habitat and adult ecology: This species has been recorded from August to May from around 200m up to 1400m, and is relatively uncommon in collections. Ebert (1969) reports it to be not uncommon in Minas Gerais in low and high canopy forest.

Specimens examined: 62 (45♂, 17♀)

BRAZIL (44♂, 17♀): *Minas Gerais*: Nova Lima Sep. 1♂ AME; *Paraná*: Castro 950m 3♂ BMNH, 2♂ USNM; Fernández Pinheiro 2600' Apr. 2♂ AME; União da Vitória 3♂ BMB; *Rio de Janeiro*: Novo Friburgo 2♂ ZMHU; *Rio Grande do Sul*: Catarina Feb. 1♂ AME; Guaraní 1♀ MCZ; Pelotas Jan. Mar. Apr. 9♂, 5♀ MCZ, 2♂ BMNH, 1♂ AMNH; Rio Grande 2♂, 4♀ BMNH; Santa Rosa Dec. 1♂ BMNH; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 1♂ FSCA; Blumenau 1♂ BMNH; Cauna Apr. 5♂ AMNH; Corupá 1♂ AMNH; no specific locality 5♂, 3♀ AMNH, 4♀ ZMHU; *São Paulo*: Alto da Serra Aug. 1♂ MNHN; Casa Branca 1♂ ZMHU; São Paulo 1♂ MCZ.

Additional locality data: **BRAZIL**: *Minas Gerais*: nr. Poços de Caldas 1000-1400m Jan.-May Dec. (Ebert, 1969). **PARAGUAY**: *Alto Paraná* (Kochalka *et al*., 1996); *Central*: Asunción (G. Canals, pers. comm., MLP). **ARGENTINA**: *Misiones* (Hayward, 1951).

Adelpha thoasa (Hewitson, 1850)

Figs. **58**; 149; 232; *293*

Identification, taxonomy and variation:

Adelpha thoasa is distinguished from all other similar species by having orange filling the area between cell bars one and two on the VHW, extending in a band to the costa, in the majority of subspecies being merged with cell bar 3 and the postcellular to form a single orange band bordering the basal edge of the white postdiscal band. In specimens where the VHW cell bars are not merged to form a single band, there appear to be two orange stripes basal of the white postdiscal band which extend and converge from the VFW discal cell onto the hindwing. Often there are two postdiscal dashes on the DFW in cells M_2-M_1 and M_1-R_5, which distinguish the species from all similar species. The male genitalia are unique in having large, laterally pointing teeth at the distal edge of the valvae and a very pronounced ventral costal bulge. Nevertheless, there is a distinct possibility that the species as conceived here may actually represent two parapatric or marginally sympatric species, and this is discussed in the account of *A. thoasa gerona*. There is geographic and individual variation in the expression of the white DFW postdiscal dashes in cells M_2-M_1 and M_1-R_5, the width of the white postdiscal band, the shape and size of the orange DFW subapical marking, and the expression of the ventral submarginal series, and four subspecies are recognised.

Adelpha thoasa is a distinctive species which has seldom been confused with any other. The wing pattern characters are similar to *A. thessalia*, and the valvae of the male genitalia, with laterally pointing "teeth" at the distal edge, very possibly indicate an intermediate stage between teeth pointing posteriorly in a plane, as in all *A. iphiclus* group members discussed above, and pointing dorsally, as in all *A. iphiclus* group members discussed below.

Range and status: East of the Andes from Venezuela to northern Argentina, Brazil, Paraguay and the Guianas. Uncommon to rare in lowland forest from sea level to 1150m, often in drier areas.

Specimens examined: 143 (129♂, 14♀)

Adelpha thoasa thoasa (Hewitson, 1850)

Figs. **58a,b**; *293*

Heterochroa thoasa Hewitson (1850: 436, pl. IX, fig. 6)

TL: Amazons. **OTL**: river Amazon. **Types**: **BMNH**(T): **LT**♀?(badly damaged - could be ♂): "Illustrated in The Butterflies of Venezuela A. Neild, 1996//121//B.M. TYPE No. Rh. 9839 Heterochroa thoasa ♀ Hew.//Amazons Hewitson coll. 79-69 Heterochroa thoasa 2.//thoasa//Paratype"; **PLT**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//119//B.M. TYPE No. Rh. 9838 Heterochroa thoasa ♂ Hew.//Thoasa Hewitson//Type//258//Tapajós//Syntype"; **BMNH**(M):

PLT♀: "Amaz.//Amazons Hewitson Coll. 79-69 Heterochroa thoasa 1."; **PLT**♂: "Amaz.//Amazons Hewitson Coll. 79-69 Heterochroa thoasa 3." [all examined]

=*Adelpha silia* Fruhstorfer (1913: pl. 107e; 1915: 522)

TL: [Encorado, Sa. Cruz de la Sierra, "Argentina"]-erroneous. **Types**: **BMNH**(R): **ST**♂: "thoasa silia Fruhst.//Syntype//TYPE//S. Cruz de la Sierra, E. Bolivia, 1905//6 (J. Steinbach)" [examined]

=*Adelpha thoasa cuyaba* Fruhstorfer (1915: 522)

TL: Mato Grosso [Brazil]. **Types**: **BMNH**(T): **ST**♂: "thoasa cuyaba Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Brasilien Mato Grosso Fruhstorfer//TYPE//Type//Syntype" [examined]

Adelpha thoasa Hew., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from remaining subspecies by having two white postdiscal dashes in cells M_2-M_1 and M_1-R_5 on the DFW, a narrow orange DFW subapical marking, typically of almost equal width to the white postdiscal dashes, and a broad white postdiscal band. It is most similar to *A. t. manilia*, which has only a single white postdiscal spot in cell M_2-M_1, with occasionally a few white scales in cell M_1-R_5, and a broad orange subapical marking. There is much variation in the width of the white DFW postdiscal dashes and the orange subapical marking; in the BMNH(M) there is one male from Villa Nova and one from São Paulo de Olivença which have a very narrow orange subapical marking and the postdiscal dashes of almost equal width to the postdiscal band, while a single male labelled "Amazon" is intermediate in both these characters to typical *A. t. thoasa*. The width of the postdiscal band is also slightly variable. This subspecies is comparatively rare in collections and I have seen insufficient specimens with accurate locality data to assess the true nature of variation, but at present it seems largely individual or local.

The name *thoasa* was first introduced as a *nomen nudum* by Westwood (1850), then described shortly after by Hewitson (1850). Hewitson referred to specimens in the British Museum and his own collection from the river Amazon, and I have examined four syntypes in the BMNH; the description and original illustration most closely match the syntype specimen in the BMNH(T) that was illustrated by Neild (1996: pl. 3, fig. 121). Given the variation in this subspecies and the possibility of further geographically stable phenotypes being discovered in the Amazon basin, I designate this specimen as the lectotype of *Heterochroa thoasa*, with the following label data: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//121//B.M. TYPE No. Rh. 9839 Heterochroa thoasa & Hew.//Amazons Hewitson coll. 79-69 Heterochroa thoasa 2.//thoasa//Paratype". Fruhstorfer (1913) figured, as a new taxon *silia*, a specimen almost identical on the dorsal surface to the lectotype of *thoasa*, of which he later placed it a subspecies (Fruhstorfer, 1915). Fruhstorfer (1915) refers to the type as being in his own collection, and a further specimen in the Tring Museum (now the BMNH(R)), but I have only been able to locate the latter. Although the type locality is "Encorado, Sa. Cruz de la Sierra, Argentina", this appears to be an error, the specimen actually originating in Santa Cruz de la Sierra in Bolivia. It matches Fruhstorfer's (1915) description in having a darker, more richly coloured ventral surface, but this represents no more than individual variation. The same is true of *cuyaba*, described by Fruhstorfer (1915) based on specimens from Mato Grosso, the syntype of which differs even less from typical *A. t. thoasa*, and both names were synonymised with *A. t. thoasa* by Hall (1938).

Range: Southern Venezuela to northeastern Bolivia and Amazonian Brazil, with two records on the edge of the Planalto de Mato Grosso. Brown & Mielke (1967) report a specimen of this subspecies in the Museu Nacional in Brazil from "Rio Maranhão" in Goiás, where they also recorded *A. thoasa gerona*, and speculate that these two subspecies meet at the edge of the planalto. See also the discussion under *A. t. gerona*.

Habitat and adult ecology: There are no published observations on the nominate subspecies, which appears to occur typically in drier regions with mixed cerrado vegetation, such as the Ventuari area of Venezuela, the Meta region of Colombia, the middle and lower Amazon and eastern Bolivia. The subspecies is rare in collections.

Specimens examined (31♂, 6♀): † - trans. to *A. t. manilia*.
VENEZUELA (1♂): no specific locality 1♂ MNHN. **COLOMBIA** (2♂): *Cundinamarca*: Bogotá 1♂ BMNH; *Meta*: San José Guaviare 1♂† JFL. **BRAZIL** (17♂, 3♀): *Amazonas*: Manaus 1♂ BMNH; Maués 1♂ BMNH, 3♂ ZMHU; Rio Purus 1♀ MNHN; São Paulo de Olivença 1♂ ZMHU, 1♂ BMB, 1♂ BMNH; Serpa Jan.-Mar. 1♀ BMB; no specific locality 1♂ ZMHU; *Mato Grosso*: Alto Rio Paraguai, Barra do Bugres (nr. Melguira) 1♂ EF; no specific locality 1♂ BMNH; *Pará*: Itaituba 1♂, 1♀ ZMHU; Pará 2♂ BMNH; Tapajós 2♂ BMNH; Villa Nova 1♂ BMNH. **BOLIVIA** (5♂): *Santa Cruz*: Buenavista 750m Jan.-Apr. 1♂ BMNH; Prov. del Sara 2♂ BMNH, 1♂ BMB; Santa Cruz de la Sierra 1♂ BMNH. **COUNTRY UNKNOWN** (8♂, 3♀): Amazon 3♂ USNM; Amazons 1♂, 2♀ BMNH; no specific locality 3♂, 1♀ BMNH.
Additional locality data: **VENEZUELA**: *Ventuari* (Neild, 1996). **BRAZIL**: *Goiás*: Rio Maranhão 700m (Brown & Mielke, 1967).

Adelpha thoasa manilia Fruhstorfer, 1915

Figs. **58c,d**; 149a-c; *293*

Adelpha thoasa manilia Fruhstorfer (1915: 522)

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: "thoasa manilia Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Bolivien Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha thoasa zalma* Fruhstorfer (1915: 522)

TL: Tarapoto, Peru. **Types**: **BMNH**(T): **ST**♂: "thoasa zalma Frusht.//Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//TYPE//Type//Syntype" [examined]

Identification, taxonomy and variation:

This subspecies is distinguished from *A. t. thoasa* by having only a single, small white postdiscal dot in cell M_2-M_1, while that in cell M_1-R_5 is absent or represented by a few scales, in addition to having a broader orange DFW subapical marking. *Adelpha t. calliphiclea* is distinguished under that subspecies, while *A. t. gerona* has a much more extensive orange DFW subapical marking and darker ventral colours. There is variation in the presence or absence and size of the white postdiscal spot on the DFW in cell M_2-M_1 and in the width of the orange subapical marking on the DFW.

Fruhstorfer (1915) described *manilia* based on an unspecified number of specimens from Bolivia, stating that it had a broader orange DFW subapical marking and only a small white postdiscal dot on the DFW anterior of the postdiscal band. He went on to describe (Fruhstorfer, 1915) *zalma* as a subspecies from Tarapoto in Peru, stating that it differed from *manilia* in having a broader white postdiscal band and the DFW orange subapical marking more vertical than horizontal. Both of these differences are apparent between the syntypes of each of these taxa in the BMNH, and for this reason I regard the *zalma* syntype as valid, even though it lacks a label indicating it to be from Tarapoto. Probably the original Tarapoto label was lost during subsequent relabelling. Hall (1938), presumably (correctly) regarding the differences as representing merely individual variation, placed *zalma* as a synonym of *manilia*.

This subspecies is rather weakly separated from the nominate subspecies, and further collecting may show the observed differences to be clinal, with characters changing from those typical of *A. t. manilia* in the foothills of the Andes to *A. t. thoasa* further east into the Amazon basin.

Range: Eastern Colombia to Bolivia, near the base of the Andes.

Habitat and adult ecology: This subspecies is generally uncommon throughout its range, and is confined to lowland rain forest in the foothills of the Andes from 200-1000m. In eastern Ecuador males are known from four sites, three of which consist of a large clearing with small bushes along a stream or river surrounded by forest in various degrees of disturbance. In these clearings males perch from 3-5m high on the edges of leaves and patrol the area with a gliding flight with few wing beats, landing on particular bushes up to 20m apart. These sites are also frequented by *A. serpa diadochus*, *A. iphicleola thessalita*, *A. thessalia thessalia* and *A. hyas hewitsoni*, and these species are probably involved in mimicry. Males may also be found puddling at damp sand. I have not seen the female in the field and it is rare in collections.

Specimens examined (54♂, 4♀): † - trans. to *A. t. thoasa*.
COLOMBIA (4♂): *Cundinamarca*: Région du Bogotá 1♂ BMNH; *Huila*: Gigante Aug. 1♂ AME; *Meta*: San Martín, Llanos of Río Meta 1♂† BMNH; *Not located*: no specific locality 1♂ USNM. **ECUADOR** (5♂, 1♀): *Napo*: Pimpilala 600m Sep. Oct. 1♀ MJP, 2♂ KWJH; Río Shandia 550m Sep. 1♂ KWJH; Tiputini Biodiversity Station 300m Aug. 1♂ KWJH; Yasuní, Est. Científica 300m Jul. 1♂ KWJH. **PERU** (36♂, 3♀): *Cuzco*: Quillabamba 950-1050m Mar. Apr. 1♂ MUSM; *Huánuco*: Tingo María Mar. May Oct. 2♂ AME, 1♀ BMB; *Junín*: Chanchamayo 1000m 2♂ BMNH, 2♂ ZMHU, 1♂ USNM, 2♂ BMB, 1♂ MUSM; La Merced 2500' Jun. Nov. 2♂ BMNH, 2♂ BMB; Río Colorado 2000' Mar. Apr. 4♂ BMNH; Satipo 1♂ AMNH; *Loreto*: Estación Biológica Pithecia, Río Samiria 180m Sep. 1♂ MUSM; Iquitos 1♂ AMNH; lower Río Tapiche Jul. 1♂ AMNH; Pebas 2♂ ZMHU, 1♂ USNM; Sarayacu 1♂ ZMHU; Yurimaguas 1♂ ZMHU; *San Martín*: Jepelacio 4♂, 2♀ AMNH; Moyobamba 850m Dec. 1♂ MUSM; Rioja 1♂ MUSM; *Not located*: Huallaga 1♂ AMNH; no specific locality 1♂ BMNH, 1♂ AMNH. **BOLIVIA** (4♂): *La Paz*: Hotel Río Selva Resort, Río Huarinilla 1000m Mar. 1♂ FSCA; *Santa Cruz*: Juntas 300m 1♂ ZMHU; *Not located*: no specific locality 1♂ BMNH, 1♂ MCZ. **COUNTRY UNKNOWN** (5♂): Amazon 1♂ BMNH; no specific locality 1♂ ZMHU, 2♂ BMB, 1♂ BMNH.

Adelpha thoasa calliphiclea (Butler, [1870]) **stat. nov.**

Figs. **58e,f**; *293*

Heterochroa calliphiclea Butler ([1870]: 58)

TL: Surinam. **Types**: **Collection unknown**: **HT**: [not located]

Papilio cytherea Linn., Cramer (1781: 170, pl. 376, fig. C, D) misid.; *Nymphalis iphicla* Linn., Godart ([1824]) misid. as female; *Adelpha calliphiclea* Butl., Kirby (1871); =*Adelpha thoasa gerona* Hew., Hayward (1951, 1973) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from *A. t. gerona* by the narrower postdiscal bands, the orange DFW subapical marking extending only as orange scaling into cell Cu_1-M_3, rather than reaching cell Cu_2-Cu_1, and on the ventral surface by the submarginal series on both wings being well marked, the pale VFW subapical marking having a dark brown line intruding a short distance from the posterior edge, dividing the two postdiscal series in cell M_2-M_1, and the orange stripes in the VHW discal cell being slightly separated by white scaling, instead of fused. *Adelpha t. thoasa* is easily distinguished by having white postdiscal dashes on the DFW in cells M_2-M_1 and M_1-R_5, while *A. t. manilia* has the orange stripes in the basal half of the VHW merged into a single band.

Cramer (1781) figured the dorsal and ventral surfaces of an *Adelpha* from "Suriname" on plate 376, fig. C and D, which he called *Papilio cytherea*, stating that he believed it to be that species based on the illustration of Linnaeus' *Papilio cytherea* published by Clerck (1764). However, the specimen is clearly not *A. cytherea*, since the DFW orange marking is completely isolated from the white postdiscal band, among many other obvious differences (Fig. 58e,f). Butler ([1870]) therefore proposed the name *calliphiclea* for this specimen, and said "There is a species very near to, if not identical with, this insect in the British Museum collection from Bolivia; it may possibly be a race of *P. iphicla*, which it nearly resembles". Possibly Butler was referring to *A. thessalia*, which in Bolivian specimens may have an elongated orange DFW subapical marking resembling Cramer's figure. *Adelpha thessalia*, however, lacks the orange stripes through the discal cell bars in the basal half of the VHW, these being typical of *A. thoasa*. These stripes appear to originate on the forewing and converge as they cross the hindwing, a character unique to *A. thoasa*. Both Jørgensen (1922) and Hayward (1973) regarded *calliphiclea* as representing the same taxon as *A. t. gerona*, although the specimen figured by Cramer differs in a number of respects (see identification notes above) from typical *A. t. gerona*, which does not occur in the Guianas. The only explanation seemed to be that Cramer's figure was badly drawn and the specimen mislabelled. However, whilst examining the specimen in the Linnaean collection, courtesy of Martin Honey at the BMNH, referred to by Butler ([1870]) as the type of Linnaeus' *Papilio iphiclus*, I was surprised to discover that this specimen is a very close match in all important respects to Cramer's figure, and it too was collected in Surinam. I therefore conclude that *calliphiclea* represents a valid subspecies of *A. thoasa* (**stat. nov.**) that is merely very rare (the specimen does not in fact represent Linnaeus' type of *Papilio iphiclus*, as explained in the notes under *A. iphiclus*). I have been unable to locate the type of *calliphiclea* in the BMNH, where several Cramer types are housed (Vane-Wright, 1975), but it is possible that it is in the RMNH.

Range: To date known only from Surinam, but presumably occurring throughout the Guianas.

Habitat and adult ecology: This subspecies is clearly extremely rare in nature, I have seen only a single specimen in all collections examined, collected at least two centuries ago, and it has remained unrecorded in French Guiana, despite an enormous amount of lepidopterological activity there in recent years (Brévignon & Brévignon, 1997). Martin Honey (pers. comm.) informs me that the specimen in the Linnaean collection cannot possibly have been the one on which Cramer's figure was based, so I conclude that the subspecies has been collected at least twice!

Specimens examined (1♂):
SURINAM (1♂): *Not located*: "Iphicla 780 Surin. Voight" 1♂ Linnaean Collection, London.

Adelpha thoasa gerona (Hewitson, 1867) **stat. rest.**

Figs. **58g-j**; 232a,b; *293*

Heterochroa gerona Hewitson (1867a: 48, pl. 26, fig. 5, 6)

TL: Minas Geraes [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Minas Geraes//Minas Geraes Hewitson Coll. 79-69 Heterochroa gerona 1.//B.M. TYPE No. Rh. 9841 Heterochroa gerona ♂ Hew.//Type//Syntype" [examined]

=*Adelpha thoasa cuyaba* f. *brevifascia* Talbot (1928: 208) unavailable name

TL: Melguira, Mato Grosso, Brazil. **Types**: **BMNH**(T): **HT**♂: "39, 27, Melguira, 10 miles S. of Diamantino 2000' 23.v.-3.vi. '27 Matto Grosso C.L. Collenette//presented by J.J. Joicey Esq. Brit . Mus. 1931-291//Adelpha thoasa cuyaba f. brevifascia ♂ H.T. Talb. 1928//Type H.T."; **BMNH**(M): **PT**♂: "39, 27, Melguira, 10 miles S. of Diamantino, 2000', 23.v.-3.vi. Matto Grosso C.L. Collenette//919//Type P.T.//Joicey Bequest Brit. Mus. 1934-120" [both examined]

Adelpha calliphiclea Butl., Kirby (1871) (Kirby listed this as No. 1a, and *iphicla* as 1); *Adelpha gerona* Hew., Kirby (1871); *Adelpha thoasa gerona* Hew., Fruhstorfer (1915); *Adelpha thoasa cuyaba* Fruhst., Talbot (1928) misid.; *Limenitis thoasa gerona* Hew., Brown & Mielke (1967); *Adelpha gerona* Hew., D'Abrera (1987)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate and *A. t. manilia* by always lacking any white postdiscal dashes on the DFW in cells M_2-M_1 and M_1-R_5, by having a broad orange DFW subapical marking which typically extends into cell

Cu_2-Cu_1, by having the pale VFW subapical marking a uniform yellowish brown, with no darker brown scaling, and by usually having the submarginal series on the ventral surface reduced, so that the distal half appears darker in colour. *Adelpha t. calliphiclea* is similar and is distinguished under that subspecies. Other similar species, such as *A. thessalia indefecta*, can be distinguished through the diagnostic characters of this species. There is slight variation in the expression of the VHW inner submarginal series, which may be entire or obscured throughout, and in the extend of the DFW orange subapical marking, which may only just enter cell Cu_2-Cu_1. All of the specimens that I have seen from Melguira and Buriti, both in Mato Grosso, differ from typical *A. t. gerona* in having narrower postdiscal bands, a reduced orange subapical marking that rarely reaches cell Cu_2-Cu_1 and usually only just enters cell Cu_1-M_3, and a darker, red-brown VFW subapical marking (Fig. 58i,j). These specimens may very possibly represent a distinct subspecies, perhaps inhabiting the watershed of the upper Río Paraguai, since the specimens I have seen from Nivac (Mato Grosso do Sul) and Paraguay are typical *A. t. gerona*. However, I refrain from describing a new subspecies until more specimens become available, since all of the specimens examined originate from essentially the same site and show variation in the characters that distinguish them from *A. t. gerona*. There are two male specimens in the BMNH(T) and BMNH(M), from Melguira, that have atypically narrow postdiscal bands, apparently representing aberrations. These specimens are the holotype and paratype of the name *brevifascia* (see below).

Hewitson (1867a) described *A. t. gerona* based on an unspecified number of specimens in his own collection from Minas Geraes, and the syntype in the BMNH(T) (Fig. 58g,h) very closely matches the original illustration. Talbot (1928) proposed the name *brevifascia* for two specimens collected by Collenette at Melguira, Mato Grosso, differing from typical *A. thoasa thoasa* by having narrow white postdiscal bands. Although the narrow width of the band is probably aberrant, these specimens are part of a population that may prove to be taxonomically distinct (see above), but since the name *brevifascia* was proposed as a form of *A. thoasa cuyaba* it is a quadrinomial and is therefore unavailable.

This taxon has been variously treated as a distinct species (Hewitson, 1867a; Kirby, 1871; D'Abrera, 1987) or as a subspecies of *A. thoasa* (Fruhstorfer, 1915; Hayward, 1964; Brown & Mielke, 1967). The male genitalia of both *thoasa thoasa* and *gerona* show no differences, and both are highly distinctive in comparison with all other *Adelpha* taxa. Both taxa also share diagnostic wing pattern characters, as discussed under the species introduction. There is, however, some evidence to suggest that the taxa *thoasa* and *gerona* may be sympatric at the edge of the Planalto de Mato Grosso, and the fact that these two taxa differ quite significantly in dorsal wing pattern suggests relatively little, if any, recent gene flow. I am indebted to Eurides Furtado for sending me locality data of specimens in his collection, demonstrating that both *thoasa* and *gerona* occur in Mato Grosso, and, if they are not sympatric, they may at least be found within 30km of each other. One specimen of typical *thoasa thoasa* in the EF is from Alto Rio Paraguai, near Melguira (the latter a locality where *gerona* has been recorded), while three specimens similar to Talbot's types of *brevifascia* are from Alto Rio Arinos, Diamantino, at the very edge of the Amazon basin. These data suggest macrosympatry, but do not provide conclusive proof of microsympatry. Possibly the two taxa are parapatric on a fine scale, occurring in slightly different habitats, perhaps analagous to *Heliconius himera* and *Heliconius erato* in southwestern Ecuador. After an intensive genetic and ecological study, Jiggins *et al.* (1996) concluded that *H. himera*, which typically occurs in drier habitats, had speciated from *H. erato*, although the two species hybridise freely in nature producing fertile offspring. Such data are, of course, lacking for *thoasa* and *gerona*. A further problem is the phenotypic similarity of *gerona*, particularly "*brevifascia*-like" specimens, to disjunct taxa such as *calliphiclea* and *manilia*. The latter taxon certainly appears to be conspecific with *thoasa thoasa*, with clear phenotypic intermediates known from Colombia in particular, but in Bolivia, at the edge of the Andean foothills and dry eastern plains, *thoasa thoasa* and *thoasa manilia* also occur very close together without apparent intergradation. If *gerona* were to be recognised as a distinct species, there would be no single character with which to define it irrespective of remaining *A. thoasa* subspecies, or *vice versa*. This is a complex problem which requires fine-scale sampling along the area of apparent contact between *thoasa* and *gerona* (and possibly *thoasa/manilia* in Bolivia), and I therefore provisionally follow a conservative approach, adopted by most regional workers (e.g., Hayward, 1964; Brown & Mielke, 1967), in treating *gerona* as conspecific with *A. thoasa* (**stat. rest.**).

Range: Eastern and southeastern Brazil to northern Argentina, with three specimens (those in the EF) known from the extreme southern edge of the Amazon basin in Mato Grosso.

Habitat and adult ecology: Little is known of the habitats or adult behaviour of this subspecies, which is uncommon and has been recorded from 600-1150m.

Specimens examined (39♂, 4♀):
BRAZIL (27♂, 3♀): *Bahia*: San Antonio da Barra 1♂, 1♀ BMNH; *Distrito Federal*: Parque do Gama 950m May 1♂ USNM; *Mato Grosso do Sul*: Nivac 1♂ BMNH, 1♂ BMB; *Minas Gerais*: Belo Horizonte 3000' Aug. Nov. 2♂ BMB, 1♂ USNM, 1♂ AMNH; Nova Lima Apr. 1♂ AME; Passa Quatro 1000m 1♂ MNHN; no specific locality Apr. 2♂ BMNH; *Paraná*: S. Paraná 1♂ BMNH; *São Paulo*: Anhangahy Nov. Dec. 2♂ BMNH; Casa Branca 3♂, 1♀ ZMHU, 1♂ BMB, 1♂ MCZ; São Paulo 3♂, 1♀ BMNH, 1♂ ZMHU, 2♂ USNM; *Not located*: no specific locality 1♂ BMNH. **PARAGUAY** (1♂): no specific locality 1♂ BMNH.
ssp. nov.?
BRAZIL (14♂, 1♀): *Mato Grosso*: Buriti 30 mi. N.E. Cuyabá 2250' Jul. 3♂ BMNH, 4♂, 1♀ AME; Colegio Buriti 700m May 2♂ USNM; Melguira, 10 mi. S. Diamantino 2000' May-Jun. 2♂ BMNH; Alto Rio Arinos, Diamantino 3♂ EF.
Additional locality data: **BRAZIL**: *Distrito Federal*: Sobradinho Woods 1050-1150m Jun.; *Goiás*: Anápolis 1000m Jan.; Cavalcante 900m; Goiânia 800m Aug.; Leopoldo Bulhões 1000m Dec.; Rio Maranhão 700m Aug.; Vianópolis 1000m Mar.; *Minas Gerais*: Paraopeba Estação Florestal de Experimentação 750m Feb. Jun.; Paraopeba Woods 750m Jun.; Uberlândia 800m; km 222 BR-040 700m Aug. (Brown & Mielke, 1967); *Minas Gerais*: Passa Quatro (Zikán & Zikán, 1968). **ARGENTINA**: *Misiones* (Hayward, 1973).

Adelpha thessalia (C. & R. Felder, 1867)

Figs. **59**; 150; 233; *293*

Identification, taxonomy and variation:

This species is very similar to *A. iphiclus* and *A. iphicleola*, from which it is distinguished by having a red-brown line dividing the postdiscal series in the pale VFW subapical marking in cells M_3-M_2 and M_2-M_1, and the inner and outer postdiscal series on the VHW are straight and parallel, rather than closer at vein M_3, though the latter character is sometimes not evident in certain specimens of *A. iphicleola*. *Adelpha iphiclus iphiclus* is also always distinguished by having the orange DFW subapical marking only extending into cell M_3-M_2 as a "hook" at the distal edge of the marking, instead of broadly bordering vein M_3. The male genitalia of *A. thessalia* differ slightly but consistently from those of *A. iphiclus*, *A. iphicleola* and *A. abyla* by having the line of dorsally pointing "teeth" at the distal tip of the valve arising from the middle of the side of the valve, rather than near the top, with the teeth not extending above the dorsal edge of the valve in lateral view, and the valve not turned upwards at the distal ventral tip. There is local and geographic variation in the size of the orange DFW subapical marking and the expression of the postdiscal and submarginal series on the ventral surface, and three subspecies are recognised.

Adelpha thessalia belongs in a group of closely related species that includes *A. iphiclus*, *A. iphicleola* and *A. abyla*, all of which have a series of dorsally pointing "teeth" arising from the side of the male genitalic valvae near the distal tip. Within this group, *A. thessalia* appears to be the most primitive species, with the postdiscal series still visibly distinct in the pale VFW subapical marking.

Range and status: Foothills of the eastern Andes from Colombia to northern Argentina, eastern Brazil to Uruguay and Paraguay. In forest from around 200m up to 2000m. Common.

Specimens examined: 476 (436♂, 40♀)

Adelpha thessalia thessalia (C. & R. Felder, 1867)

Figs. **59a,b**; *293*

Heterochroa thessalia C. & R. Felder (1867: 417)

TL: "Río Negro Superior, Brasilia Septentrional"-erroneous. **Types**: **BMNH**(R): **ST**♂: "Type//Syntype//Río Negro Type//Thessalia Felder//Thessalia n." [examined]

Heterochroa ephesa ? Mén., Felder & Felder (1862) misid.; *Adelpha basilea* var. *thessalia* Fldr., Kirby (1871); *Adelpha thessalia thessalia* Fldr., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. t. cesilas* by having a darker ventral surface, with thinner postdiscal and submarginal series and less or no red-brown shading between discal cell bars one and two on the forewing, and by often having the DFW orange subapical marking confined to cells M_3-R_5, instead of extending into cell Cu_1-M_3. *Adelpha iphicleola thessalita* and *A. iphiclus ephesa* (latter not sympatric with *A. t. thessalia*) are also very similar, but may be distinguished by the characters that define the species. There is individual variation in the size of the orange spot in cell Cu_1-M_3 on the DFW, which is usually absent in the north of the range and more prevalent in the south. One male Bolivian specimen has the orange extending along the outer postdiscal series into cell Cu_2-Cu_1, probably representing intergradation with *A. t. cesilas*.

Felder & Felder (1867) described this species based on an unspecified number of male specimens from the upper Río Negro in Brazil. In fact, this locality is erroneous, and all Felder specimens labelled "Río Negro" actually originated in the Huallaga valley above Yurimaguas in northeastern Peru (Lamas, 1976). The original description compares the species with *A. iphiclus ephesa*, which this species closely resembles on the dorsal surface, and comments on the most important diagnostic character for *A. thessalia*, the red-brown line dividing the pale VFW subapical marking, in addition to the less heavily marked ventral postdiscal and submarginal series. I have examined a syntype male in the BMNH.

Early authors regarded this species as a variety of *A. iphiclus*, until Fruhstorfer (1915) correctly treated it again as a distinct species.

Range: The eastern slopes of the Andes from Colombia to northern Bolivia.

Habitat and adult ecology: This subspecies is common in intact to heavily disturbed primary cloud forest habitats and lowland rain forest along the base of the Andes, from 600-1800m, with records of 2000m in Bolivia, though it occurs most commonly from 800-1500m. It flies throughout the year, at least in eastern Ecuador. Males may be seen puddling singly or attracted to rotting fish along forested rivers, while the female is much rarer, I have only seen a single specimen in collections and have never observed it in the field.

Specimens examined (199♂, 1♀): † - trans. to *A. t. cesilas*.
"**MEXICO**" (1♂): *Guerrero*: no specific locality 1♂ BMNH-error. **COLOMBIA** (31♂): *Boyacá*: "Muzo" 8♂ AME-error; Santa María Dec. 1♂ ESM; *Cauca*: "Popayán" 1♂ BMNH-error; *Cundinamarca*: Bogotá 1♂ BMNH; *Meta*: Pipiral 1♂ MNHN; Río Negro 2400' Jan. 1♂ USNM; Villavicencio 12♂ AMNH; *Not located*: no specific locality 1♂ MNHN, 5♂ AMNH. **ECUADOR** (46♂): *Morona-Santiago*: Macas 1♂ AMNH; Río Abanico Oct. 1♂ MJP; 2°-4°S, 78°W 875m Nov. Dec. 2♂ AMNH; *Napo*: Satzayacu Dec. 1♂ AME; *Pastaza*: Puyo Dec. 2♂ AMNH; Río Puyo 1300m Oct. 1♂ KWJH; Shell 1050m Feb. 2♂ KWJH; "*Pichincha*": Quito 1♂ MNHN-error; *Sucumbíos*: La Bonita-Rosa Florida rd., km 15, 1550m Mar. 1♂ KWJH; *Tungurahua*: Río Cholo Hay 1300m Sep. 1♂ KWJH; Río Negro 1300m Apr. 2♂ AME; Topo Mar. May 1♂ KWJH, 1♂ AME; *Zamora-Chinchipe*: Quebrada Chorillos Nov. 3♂ DAT; Zamora 3-4000' 16♂ BMNH; *Not located*: E. Ecuador 1♂ KWJH; middle Ecuador 1♂ AMNH; Oriente 5♂ AMNH; no specific locality 3♂ AMNH. **PERU** (82♂, 1♀): *Amazonas*: Falso Paquisha 800m Oct. 1♂ MUSM; Huambo 3700' 2♂ BMNH; *Ayacucho*: Río Piene 2♂ AMNH; *Cuzco*: Caradoc 4000' Feb. 3♂ BMNH; Cuzco 2♂ MNHN; Marcapata 1♂ BMNH; Río Urubamba 1♂ MNHN; Santa Isabel 12-1500m Feb. 1♂ MUSM; *Huánuco*: Tingo María Mar. Jul. Aug. Oct. 1♂ FSCA, 7♂ AME; *Junín*: Chanchamayo 1000m 14♂ BMNH, 2♂ ZMHU, 2♂ BMB; La Merced 6♂ BMB; Río Perené 1♂ MUSM; San Ramón 3000' Aug.-Oct. 2♂ BMNH; Satipo Mar. Sep.-Dec. 1♂ BMNH, 4♂ AME; *Loreto*: "Pebas" 1♂ MCZ-error; "Río Negro" [=Río Huallaga] 1♂ BMNH; *Pasco*: Pozuzo 3♂ BMNH, 2♂, 1♀ BMB, 2♂ MUSM; *Puno*: Carabaya Jun. 1♂ BMNH; Chaquimayo 2500' Apr. 1♂ BMNH; La Unión 2000' Nov. 1♂ BMNH; *San Martín*: Huayabamba 3500' 1♂ BMNH, 1♂ ZMHU; Jepelacio 3♂ AMNH; Tarapoto 1♂ BMNH, 1♂ AMNH; *Ucayali*: Boquerón Abad Mar. 1♂ AME; *Not located*: no specific locality 6♂ BMNH, 1♂ BMB, 1♂ MNHN, 1♂ JFL. **BOLIVIA** (37♂): *Cochabamba*: Charapaya 1300m May 1♂† BMNH; El Palmar Mar. 1♂ AME; 5 days N. Cochabamba Aug. 2♂ BMNH; San Antonio 1800m 1♂ ZMHU; Yungas del Espírito Santo 5♂ BMNH; *La Paz*: below Coroico 1200m Mar. 1♂ FSCA; Caranavi 700m Sep. 1♂ KWJH; Choro, N. Yungas Nov. 1♂ JFL; Chulumani 2000' Jan. 2♂(1†) BMNH, 1♂ MCZ; Coroico 1000m Apr. Sep. 2♂ BMNH; Hotel Río Selva Resort 1♂ USNM; La Paz-Coroico rd. 2000m Sep. 1♂ KWJH; Río Coroico Apr. 1♂ AMNH; Río Huarinilla 1000m Mar. 1♂ FSCA; Río Tanampaya 2♂ ZMHU; Río Songo 1200m 1♂ ZMHU; Yolosa 1200m Sep. 1♂ KWJH; *Santa Cruz*: Río Negro 1♂ AME; Río Juntas 100m 1♂ ZMHU; *Not located*: Cazahuarani Apr. 1♂ AMNH; Pitiguaya May 1♂ AMNH; Yungas 1200m Nov. 2♂ BMNH; no specific locality 4♂ BMNH, 1♂ BMB. **COUNTRY UNKNOWN** (2♂): no specific locality 1♂ MNHN, 1♂ MCZ.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Miriumi 900m Oct.; *Napo*: Pimpilala 600m Apr.; *Sucumbíos*: Río Palmar 1200m Nov., Río Sucio 1800m Nov. (Willmott & Hall, sight records).

Adelpha thessalia cesilas Fruhstorfer, 1915

Figs. **59c,d**; 150a,b; *293*

Adelpha thessalia cesilas Fruhstorfer (1915: 523)

TL: Pilcomayo to the Río Grande [Bolivia]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//thessalia cesilas Fruhst.//R. Pilcomayo-R. Grande December 1903 (J. Steinbach)//TYPE//Type//Syntype" [examined]

=*Adelpha abia* fa. *ampla* Hayward (1935: 189, pl. XIII, fig. 5) **syn. nov.**

TL: Yuto, Salta, Argentina. **Types**: **FIML**: **HT**♂: "Adelpha abia Hew. fa. ampla Holotipo ♂//Yuto Salta 21/6/33//Tipus//3131" [photograph examined]; **AT**♀, 3**PT**♂, 2**PT**♀: Tabacal, Salta, 18.VI.33, Köhler; **PT**♂, 2**PT**♀: Urundel, Salta, 16.VI.33, Köhler [not examined]

Adelpha mincia ampla Hay., Hayward (1964, 1973)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the enlarged, more heavily marked postdiscal and submarginal series on the ventral surface, particularly the latter, which almost merge on the hindwing. The area basal of the white VHW postdiscal band is also lighter, the red-brown line bordering the basal edge of the postdiscal band is thinner and does not merge with the third discal cell bar, the discal cell bars on the VFW are thinner and have less red-brown scaling between them, and the silvery white dashes of the upper postdiscal band are much broader, almost filling the area between vein M$_3$ and the costa. Characters that distinguish this subspecies from *A. t. indefecta* are discussed under that subspecies. Certain specimens also have a longer orange DFW subapical marking, which extends into cell Cu$_1$-M$_3$, and although this is subject to slight individual variation, there appears to be a general tendency for the marking to increase in size from north to south within the range. Specimens from Mato Grosso typically have a slightly narrower orange DFW subapical marking, which does not extend into cell M$_3$-M$_2$, and broader white postdiscal bands.

Fruhstorfer (1915) described this subspecies based on an unspecified number of specimens collected by Steinbach in December, from the Río Pilcomayo to the Río Grande in Bolivia. I have examined a syntype in the BMNH(T) (Fig. 59c,d), while there are a further two possible syntypes in the BMNH(R) with the same locality data as this syntype. Fruhstorfer mentioned most of the distinguishing characters discussed above, and attributed them, to some extent, to the subspecies inhabiting a drier climate. He states that specimens of the nominate subspecies from Coroico, collected in August, also have a paler ventral surface, being the product of the dry season. I have also collected specimens of the nominate subspecies from Coroico and Caranavi in September which have slightly paler ventral surfaces, but it is unclear from the specimens that I have examined in collections from this region whether these differences are seasonally induced or the result of intergradation with *A. t. cesilas*. Certainly, *A. t. cesilas* seems phenotypically stable for the diagnostic characters over the range given below. Hayward (1935) described *ampla* as a form of *A. abia*, following Fruhstorfer's (1915) erroneous application of the latter name to *A. thessalia indefecta*, from a type series of ten specimens from Yuto, Tabacal and Urundel in northern Argentina. I have examined a photograph of the holotype, courtesy of Gerardo Lamas, and the original figure of, I presume, one of the paratype males, all of which are in the FIML. These specimens differ from the syntype of *cesilas* only in having the DFW orange subapical marking extended just past vein Cu$_1$, a typical characteristic of southern specimens which also occurs in some Bolivian specimens, and I therefore synonymise *ampla* with *cesilas* (**syn. nov.**). Hayward (1973) lists both *A. thessalia cesilas* and "*A. mincia ampla*" from Salta in Argentina, presumably based on the variation in the DFW orange subapical marking; his earlier figure of the dorsal surface of a specimen under the former name (Hayward, 1964) resembles the nominate subspecies, with only a trace of orange in cell Cu$_1$-M$_3$ on the DFW.

Range: Andean foothills in southern Bolivia to northern Argentina, northeast to Mato Grosso in Brazil.

Habitat and adult ecology: There are no published observations on this subspecies, which is not uncommon in collections. It is not clear whether this subspecies is confined to hilly areas, and thus exists in three disjunct populations, or is continuously distributed throughout the northeastern Bolivian plains.

Specimens examined (54♂, 2♀): † - intermediate to *A. t. indefecta*, orange on DFW into anterior half of cell Cu$_2$-Cu$_1$.

BOLIVIA (11♂): *Chuquisaca*: Río Burmejo-Río Pilcomayo Dec. 2♂ BMNH; Río Grande Dec. 2♂ BMNH; Río Pilcomayo-Río Grande Dec. 3♂ BMNH; *Santa Cruz*: Buenavista 400m 1♂ MUSM; Chiquitos 2♂ MNHN; Santiago de Chiquitos Aug. 1♂ BMNH. **ARGENTINA** (34♂, 2♀): *Jujuy*: Arroyo Apr. 5♂ AMNH; Calilegua 600m Apr. 5♂ AMNH; P.N. Calilegua 1600-2500m Feb. Apr. 9♂, 2♀ AMNH; *Salta*: Agua Blanca 500m Jun. 2♂ AME; Colonia Santa Rosa 350m Oct. 1♂ AMNH; Mosconi May 1♂ AME; Orán Jun. 3♂(1†) AME; Piquerenda Vieja Feb. 550m 1♂ AMNH; Río Seco, Urundel 350m May Jun. 5♂ AMNH, 1♂ AME; Salta 450m Apr. 1♂ USNM, 1♂ BMB. **BRAZIL** (8♂): *Mato Grosso*: Buriti Apr. Jul. 4♂ USNM, 1♂ AME; Chapada 1♂ MCZ; Cuiabá-Corumbá river system 1♂ BMNH; Cuiabá 1♂ USNM. **COUNTRY UNKNOWN** (1♂): Puihal, L.C. Apr. 1♂ FSCA.

Additional locality data: **ARGENTINA**: *Salta*: Tabacal (Hayward, 1935).

Adelpha thessalia indefecta Fruhstorfer, 1913 stat. nov.

Figs. **59e,f**; 233a,b; *293*

Adelpha indefecta Fruhstorfer (1913: pl. 107e; 1915: 523)

TL: [Paraguay]. **Types**: **BMNH**(R): **ST**♂: "Syntype//TYPE//33//R// Sapucay Paraguay 12.X.03 (W. Foster)//iphicla indefecta Fruhst." [examined]

=*Adelpha mincia* Hall (1938: 257) **syn. nov.**

TL: Paraguay. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//abia mincia Fruhst.//Paraguay H. Fruhstorfer//TYPE//Syntype"; numerous **PLT**, see below [all examined]

Adelpha iphicla indefecta Fruhst., Fruhstorfer (1915); *Adelpha abia* Hew., Fruhstorfer (1915), Hayward (1931) misid.; *Limenitis mincia* Hall, Brown & Mielke (1967); *Adelpha mincia* Hall, D'Abrera (1987); *Adelpha ampla mincia* Hall, Mielke & Casagrande (1997).

Identification, taxonomy and variation:

This subspecies is distinguished from *A. t. cesilas* by having narrower white postdiscal bands, especially on the DFW where the band usually tapers anteriorly, a broader orange DFW subapical marking which typically extends to cell Cu$_2$-Cu$_1$, and a darker ventral surface similar to the nominate subspecies. It differs from the nominate subspecies in the more extensive orange DFW subapical marking, which extends at least to broadly border vein Cu$_1$, and in the inner submarginal series on the ventral surface typically being broader. *Adelpha iphiclus ephesa* and *A. iphicleola leucates* are distinguished by the characters diagnostic for this species, in addition to several mentioned in the discussion below concerning the identity of the holotype specimen of *indefecta*. There is some variation in whether the orange DFW subapical marking enters cell Cu$_2$-Cu$_1$, and slight variation in the width of the white postdiscal band.

Fruhstorfer (1913) figured the dorsal surface of this subspecies based on a single specimen in the Tring Museum from Paraguay, and later (Fruhstorfer, 1915) described it as a subspecies of *A. iphiclus*. It should be noted that although the syntype specimen is known to be unique from Fruhstorfer's (1915) comments, it cannot be regarded as a holotype since there was no information on the number of specimens in the original description (Fruhstorfer, 1913). The syntype specimen is in the BMNH(R), but unfortunately lacks an abdomen. It differs from all other specimens of *A. t. indefecta* that I have examined in the orange DFW subapical marking consisting of an irregular pentagon in cells M$_3$-R$_5$, as in typical *A. t. thessalia*, with an orange bar in the anterior half of cell Cu$_1$-M$_3$, and slight orange scaling at the outer postdiscal series at vein Cu$_1$. After a great deal of thought and examination of long series of specimens, I conclude that this syntype specimen is actually aberrant in the shape of the reduced orange DFW subapical marking, which causes the resemblance to *A. iphiclus* that led Fruhstorfer (1915) to place it as a subspecies of that species. The syntype of *indefecta* differs from specimens transitional between *A. iphiclus iphiclus* and *A. iphiclus ephesa* in the BMNH from Sapucay, the type locality, in having orange in cell Cu$_1$-M$_3$ on the DFW at the basal edge of the subapical marking (absent in all *A. i. ephesa* and *A. i. iphiclus*), the basal edge of the orange DFW subapical marking is more vertically orientated, the hindwing is more triangular with a straight rather than convex distal margin, the white postdiscal band on the DHW is thinner and has a slightly concave rather than convex distal margin, the postdiscal series on the VHW are parallel rather than closer at vein M_3, and the pale VFW subapical marking has a trace of a red-brown line dividing the postdiscal series in cells M_3-M_2 and M_2-M_1, absent in all *A. i. ephesa* and *A. i. iphiclus*. All of these differences are characteristic of typical specimens of this taxon, and of *A. thessalia* in general, and I therefore place *indefecta* as a subspecies of *A. thessalia* (**stat. nov.**). Fruhstorfer (1915) treated *A. t. indefecta* as *A. abia*, an error noticed by Hall (1938), who described the taxon as a new species, *A. mincia*, based on a Fruhstorfer manuscript name published earlier as a *nomen nudum* by Martín *et al*. ([1923]). All subsequent authors then followed Hall in referring to this taxon as *Adelpha mincia*. Hall mentions there being specimens of this taxon in the BMNH from a long series of localities, including Goyaz, Bahia, Minas Geraes, Rio de Janeiro, São Paulo, Santa Catharina, Paraná, Rio Grande do Sul, Paraguay and N.W. Argentina. He also included specimens from his collection (now the BMB) from Paraná and Novo Friburgo. The description is brief but clearly refers to this species, and Hall mentioned that he was introducing the name based on a manuscript name attached to certain Fruhstorfer specimens and that the types were from Paraguay in the BMNH. As it is not possible to trace all of the specimens designated by Hall as types, since Hall failed to label any of them, and given the remote possibility that some might apply to other taxa, I designate as the lectotype of *Adelpha mincia* the specimen in the BMNH(T) with the following data (Fig. 59e,f): "Fruhstorfer Coll. B.M. 1937-285//abia mincia Fruhst.//Paraguay H. Fruhstorfer//TYPE// Syntype". This specimen is typical of *A. t. indefecta*, so I synonymise *mincia* with *indefecta* (**syn. nov.**).

Range: Eastern Brazil to Uruguay, west to northeastern Argentina and Paraguay.

Immature stages: The identity of the species called "*Adelpha calliphiclea*" by Jørgensen (1922, 1924) and Blanchard (1928) has always been obscure, but I believe that they were most probably referring to *A. thessalia indefecta*, a hypothesis consistent with the brief description of the adult given by Jørgensen (1922). Jørgensen (1922) reared the species in Paraguay, where he stated the larvae to be common from May to July in the Trinidad botanical garden on *Ilex paraguariensis* (Aquifoliaceae). Through correspondence with Gustavo Canals, at the MLP, I have been able to examine several specimens of *A. t. indefecta* identified in that collection as "*A. calliphiclea*". One specimen was collected in 1913 by Jørgensen in Argentina, the remaining two at Villarrica in Paraguay in 1934, quite probably also by Jørgensen since this was a site that he had visited (e.g., see Jørgensen, 1922). Both of the latter bear identification labels stating "*A. calliphiclea*", but are in fact *A. thessalia indefecta*. Probably Jørgensen was unable to identify them correctly at that time since the syntype specimen of *indefecta* figured by Fruhstorfer (1913) is atypical of the taxon.

According to Jørgensen (1922), the pupa is golden in colour and spiny, with two conical head horns. The thorax has a high keel, and the abdomen is prolonged toward the thorax, forming a large hook. The adult eclosed after 20 days.

Jørgensen found several larvae on the same plant, and his description of their behaviour shows it to be typical of the genus; the larvae leave the leaf midrib intact and construct frass chains, beside which they rest. Pupation takes place on the same leaf.

Habitat and adult ecology: This subspecies is one of the most common species in its area, and has been recorded in every month of the year up to 1400m. Contrary to other subspecies, the female appears to be not uncommon. Ebert (1969) found the subspecies to be not uncommon to common in Minas Gerais in secondary forest habitats. Brown (1992) reports the subspecies from the Serra do Japi, São Paulo, in lowland to premontane, semihumid forest, where it occurs in open areas, as well as in fields, gardens and areas of extensive secondary growth. Hayward (1940) mentioned that individuals had occasionally been captured at traps baited with a product called "clensel" in Argentina.

Specimens examined (183♂, 37♀): † - trans. to *A. t. cesilas*. **BRAZIL** (128♂, 27♀): "*Amazonas*": Canuma Apr. 4♂, 1♀ AMNH-error; *Bahia*: Cachimbo 1♂ BMNH; *Goiás*: Goyaz 2♂ BMNH; *Minas Gerais*: Belo Horizonte Jun. Aug. 1♀ AMNH, 1♂ USNM; Passa Quatro 1♂ MNHN; no specific locality 2♂ BMNH; *Paraná*: Castro 950m Feb. Mar. Oct. 8♂, 3♀ BMNH, 3♂, 1♀ USNM; Caviúna Jun. 2♂, 2♀ AMNH; Fernández Pinheiro 2600' Apr. 3♂ AME; Iguaçu Oct.-Dec. 6♂ BMNH; N. Paraná 5♂, 1♀ AMNH; Rolândia Nov. 1♀ AMNH; Toledo 1♂ AME; União da Vitória 2000' Dec. Jan. 18♂ BMB; no specific locality 1♂ AMNH; *Rio de Janeiro*: Nova Friborgo 2800' Jan. 1♂ BMB; Petrópolis 1♂ USNM; Rio 2♂ BMNH, 1♂ MCZ; *Rio Grande do Sul*: Guaraní Jan. Dec. 2♂ MCZ, 1♂ BMNH; Pelotas Nov. Jan. Feb. May 5♂, 4♀ MCZ; Rio Grande do Sul 4♂, 9♀ BMNH, 1♂ ZMHU; Santa Cruz Apr. 1♂ AME; Santa Rosa Dec. 1♂ BMNH, 1♂ MCZ; *Santa Catharina*: Blumenau 2♂ BMNH, 1♂ MCZ; Campos de Palmar 1♂ MCZ; Cauna Apr. 15♂, 2♀ AMNH; Lages 1♂ ZMHU; Pinhal 1♂ AME; Trombudo Alto Jan. 1♂ AME; no specific locality 7♂ AMNH, 3♂(2†) MCZ, 2♂ USNM, 1♂ ZMHU; *São Paulo*: Anhangahy Nov. 1♂ BMNH; Araçatuba Oct. 1♂ AMNH; Casa Branca 3♂, 1♀ ZMHU; São Paulo Mar. May 3♂, 1♀ MCZ, 4♂ BMNH, 1♂ AMNH; *Not located*: no specific locality 1♂ MNHN. **PARAGUAY** (37♂, 5♀): *Caaguazu*: Yhú Sep.-Dec. 7♂ BMNH; *Central*: Aregua 1♂ AME; Asunción Jul.-Sep. Nov. 1♂ JFL, 1♂ AMNH, 1♂† MNHN; Nueva Italia Sep. 1♂ AMNH; Trinidad Jul. 8♂, 3♀ AMNH, 1♂, 1♀ USNM; *Paraguarí*: Sapucay Oct. Dec. 6♂ BMNH, 1♂ USNM, 1♂ BMB; *San Pedro*: Jejuy R. 1♂ BMNH; *Not located*: Central Paraguay 3♂ BMNH; no specific locality Nov. 1♂ JFL, 1♂, 1♀ BMNH, 1♂ USNM, 1♂† MNHN. **ARGENTINA** (8♂, 2♀): *Buenos Aires*: Buenos Aires 1♀ MNHN; *Entre Ríos*: La Soledad, close to frontier of Uruguay 1♀ BMNH; *Misiones*: Puerto Aguirre May 3♂ BMNH; Río Paraná Nov. 1♂ BMNH; San Ignacio May Sep. 1♂ USNM, 1♂ BMNH; no specific locality Nov. 1♂ AMNH; *Not located*: Chaco de Santiago, Río Salado Mar. 1♂ BMNH. **URUGUAY** (2♀): *Montevideo*: Montevideo "at light" 1♀ MCZ; *Not located*: Isla de Paredan Mar. 1♀ MCZ. **COUNTRY UNKNOWN** (10♂, 1♀): no specific locality 6♂ MCZ, 3♂ USNM, 1♀ BMNH, 1♂ MNHN.

Additional locality data: **BRAZIL**: *Goiás*: Anápolis 1000m Jul. (Brown & Mielke, 1967); *Minas Gerais*: nr. Poços de Caldas 1200-1400m Jan.-May Dec. (Ebert, 1969); *São Paulo*: Mata de Santa Genebra, nr. Campinas (Ecoforça, 2000); Parque Estadual Morro do Diabo (Mielke & Casagrande, 1997); Serra do Japi (Brown, 1992). **PARAGUAY**: *Alto Paraná*; *Canindeyú*; *Itapúa*; *Misiones* (Kochalka *et al*., 1996); *Guaíra*: Villarrica Jun. (G. Canals, pers. comm., MLP). **ARGENTINA**: *Entre Ríos*: Concordia (Hayward, 1940). **URUGUAY**: *Not located*: Artigas (Yacaré) Jan. (Biezanko *et al*., 1957).

Adelpha iphiclus (Linnaeus,1758)

Figs. **60**; 151; 234; *294*

Identification, taxonomy and variation:

There is no single character that distinguishes this species from its sister species, *A. iphicleola*, but taxa that are apparently parapatric or closely allopatric are grouped together on the basis of shared characters between pairs of taxa. In fact, I regard the problem of how the taxa are related between these two species as certainly the most difficult in the genus, and one that remains unsatisfactorily resolved. In particular, specimens from the biogeographically complex region of northern and northwestern Venezuela, central and northwestern Colombia and eastern Panama are occasionally impossible to identify using characters that are useful in distinguishing the two species elsewhere in their ranges. This is also true of specimens from Trinidad and coastal regions of eastern South America. Part of the problem is the probable influence of seasonality in these peripheral areas, the lack of long series in collections with precise locality data and the natural variability of these species. In the hope that future field work may resolve some of these problems, I offer a discussion below of characters that are stable in certain regions.

In northwestern central America, where this species is sympatric with nominate *A. iphicleola*, the two species are always readily distinguishable. *Adelpha iphiclus* has the orange DFW subapical marking only entering cell M_3-M_2 as a small, posteriorly directed orange dash at the distal edge of the marking, whereas in *A. iphicleola* the marking extends to broadly border along vein M_3. Other characters are discussed under *A. iphicleola*, and many of these, particularly ventral characters, are apparent and useful in separating specimens of *A. iphiclus* from *A. iphicleola leucates*, while the enlarged shape of the DFW orange subapical marking distinguishes *A. iphicleola thessalita* from *A. iphiclus*. Problems in identification arise when the orange DFW subapical marking is reduced in width in *A. iphicleola*, such that it extends into cell M_3-M_2 only at the distal tip, as in typical *A. iphiclus*. The identification of these subspecies is discussed under each taxon. I have dissected specimens from throughout the range of both of these species, and can find no consistent genitalic differences, despite the claim of Austin (1992). The wing shape, width of the postdiscal band, and shape of the orange DFW subapical marking varies both individually and geographically in *A. iphiclus*, and I recognise three subspecies.

This species is one of the most taxonomically confused, and a detailed discussion is given under the nominate subspecies. It is the sister species of *A. iphicleola*, or possibly *A. abyla*.

Range and status: Mexico to western Ecuador, Venezuela to Bolivia, Brazil, Paraguay, Guianas and Trinidad. Common throughout its range in disturbed and primary forest habitats from sea level to 1250m.

Specimens examined: 1113 (946♂, 167♀)

Adelpha iphiclus iphiclus (Linnaeus, 1758)

Figs. **60a-d**; 234a,b; *294*

Papilio iphiclus Linnaeus (1758: 486, n. 172)

TL: Cayenne, French Guiana. **OTL**: Indiis. **Types**: **BMNH**(M): **NT**♂: “Cayenne//Ex Oberthür Coll. Brit. Mus. 1927-3.” [examined]

=*Papilio basilea* Cramer (1777: 139, pl. 188, fig. D) **stat. rest.**

TL: Cayenne, French Guiana. **OTL**: Suriname. **Types**: **BMNH**(M): **NT**♂: “Cayenne//Ex Oberthür Coll. Brit. Mus. 1927-3.” [examined]

=*Adelpha iphicla funalis* Fruhstorfer (1915: 523)

TL: Río Dagua, Colombia. **Types**: **BMNH**(R): **HT**♂: “Syntype//TYPE//Río Dagua, Colombia W. Rosenberg//iphicla funalis Fruhst.” [examined]

=*Adelpha iphicla exanima* Fruhstorfer (1915: 523)

TL: Venezuela. **Types**: **BMNH**(T): **LT**♂: “Illustrated in The Butterflies of Venezuela A. Neild, 1996//122//Fruhstorfer Coll. B.M. 1937-285//iphicla exanima Fruhst.//Venezuela Fruhstorfer//TYPE//Type//Syntype”; **BMNH**(R): **PLT**♂: “TYPE//Suapure Venez. 13.XI.99 (Klages)//iphicla exanima Fruhst.” [both examined]

=*Adelpha iphicla pharae* Fruhstorfer (1915: 523)

TL: Mato Grosso [Brazil], Peru, Bolivia. **Types**: **BMNH**(T): **ST**♂: “Fruhstorfer Coll. B.M. 1937-285//iphicla pharae Fruhst.//Peru H. Fruhstorfer//TYPE//Type//Syntype”; **BMNH**(M): **ST**♂: “TYPE//Peru H. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1933-131”; **ST**♂: “Mato Grosso H. Fruhstorfer//Paratype//iphicla pharae Fruhst.//Fruhstorfer Coll. B.M. 1937-285” [all examined]

Papilio iphiclus Linn., Linnaeus (1764: 311, n. 129), Drury (1770: 27, pl. 14, fig. 3, 4); *Papilio cythereus* Linn., Herbst (1793: 137, pl. 148, fig. 1, 2) misid.; *Nymphalis iphicla* Linn., Godart ([1824]: 374, n. 80) in part, refers to Drury’s and Clerck’s figs.; *Adelpha basilis* Hübn., Hübner ([1819]) repl. name?; *Heterochroa iphicla* Linn., Westwood (1850) in part, refers to Drury’s and Clerck’s figs., Hewitson (1850), Bates (1865), Felder & Felder (1867), Butler ([1870]: 58); *Heterochroa basilea* Cram., Westwood (1850), Ménétriès (1857), Boisduval (1870); *Adelpha basilea* Cram., Kirby (1871); *Adelpha iphiclus* Linn., Aurivillius (1882), Fruhstorfer (1915), Hall (1938), Hayward (1973), DeVries (1987), Neild (1996); *Adelpha iphicla* Linn., Godman & Salvin (1884); *Limenitis iphicla* Linn., Ross (1964, 1976) (probably *A. iphicleola iphicleola*), Brown & Mielke (1967); *Adelpha iphicla iphicleola* Bates, D’Abrera (1987), in part, misid.; *Adelpha iphiclus iphicleola* Bates, Lamas & Small (1992) in part, misid.

Misapplication of the names *iphiclus* and *basilea*:

Papilio iphiclus Linn., Clerck (1764: tab. 41 [fig. 3, numbered in register at back]) = *A. naxia*; *Papilio iphicla* Linn., Cramer (1777: 139, pl. 188, fig. E, F) = *A. serpa diadochus*; *Papilio iphiclus* Linn., Herbst (1793: 138, n. 79, tab. 148, fig. 3, 4) = *A. serpa diadochus*; *Adelpha iphicla* Linn., Hübner ([1819]: 42) refs. Cramer, 188, E, F = *A. serpa diadochus*; *Nymphalis iphicla* Godt. [sic], Lucas (1835: 126, pl. 68) = *A. iphiclus ephesa*; *Heterochroa basilea* Cram., Bates (1865) = *A. naxia*; *Heterochroa iphiclus* Linn., Boisduval (1870) = *A. naxia*; *Adelpha iphicla* Linn., Kirby (1871) = *A. naxia*, *A. iphicleola*, *A. basiloides*; *Adelpha basilea* Cram., Godman & Salvin (1884) = *A. naxia*

Identification, taxonomy and variation:

This subspecies is distinguished from *A. i. ephesa* by having the orange subapical marking on the DFW usually only extending into cell M_3-M_2 as a “hook” along the outer postdiscal series, rather than extending to form an irregular pentagon with one side broadly bordering along vein M_3. Some specimens of *A. i. iphiclus* have the orange of the marking extending into cell M_3-M_2 along the length of the marking, but the posterior edge of the marking in cell M_3-M_2 is curved towards vein M_2 in *A. i. iphiclus*, and away from the vein in *A. i. ephesa*. *Adelpha i. iphiclus* typically has broader white postdiscal bands than *A. i. ephesa*. *Adelpha i. estrecha* is distinguished from *A. i. iphiclus* by the very narrow dorsal postdiscal band, tinged very pale blue, which has the spot in cell M_3-M_2 wider than the rest of the band, in addition to the reduced orange subapical marking on the forewing. The forewings are also distinctly more pointed and falcate than the nominate subspecies. The characters that distinguish *A. thessalia* from *A. iphiclus* are discussed under that species. *Adelpha iphicleola iphicleola* is distinguished as discussed under the general identification section for *A. iphiclus*. *Adelpha iphicleola thessalita* may be distinguished from *A. i. iphiclus* by the same characters of the DFW orange subapical marking as *A. i. ephesa*, in addition to the slightly tapering white band on the DFW with a slightly concave distal edge, and by its overall smaller size and less rounded, but more distally dentate, hindwing. *Adelpha i. iphiclus* is very similar, if not sometimes indistinguishable from, *A. iphicleola gortyna* and *A. iphicleola leucates*. *Adelpha iphicleola gortyna* typically has the orange DFW subapical marking shaped as a rough trapezoid, with one sloping side along the costa, the other parallel to the distal margin, such that the orange area in cell M_3-M_2 forms a posteriorly pointing triangle, the base of which is the same width as the orange area in cell M_2-M_1. In *A. iphiclus iphiclus*, the orange area in cell M_3-M_2 forms a posteriorly pointing, attenuated triangle, the base of which is typically only half the width or less than that of the orange area in cell M_2-M_1. In *A. iphicleola gortyna*, the distal edges of the orange marking in cells M_3-R_5 are slightly concave, whereas they are straight in *A. iphiclus iphiclus*, while the white DFW postdiscal band in the former species does not taper anteriorly and has a slightly concave distal edge. The pale VFW subapical marking in *A. iphicleola gortyna* is typically less obscured with red-brown scaling, and has more sharply defined basal and distal edges. *Adelpha iphicleola leucates* is distinguished by having the orange DFW subapical marking of similar shape to *A. iphicleola gortyna*, and has additional ventral characters typical of *A. iphicleola*, as discussed under that species.

The nominate subspecies exhibits slight local and geographic variation, but none in my opinion that is sufficiently pronounced or consistent to warrant separate subspecific recognition. However, quite possibly when more material becomes available from localities in areas such as northern Venezuela, there may prove to be consistently distinct populations worthy of subspecific recognition. Central American specimens tend to have slightly narrower postdiscal bands and a less reddish ventral surface, while specimens from Guerrero in Mexico tend to have an orange DFW subapical marking similar to *A. iphicleola gortyna* (these specimens however are easily distinguished from the sympatric *A. iphicleola iphicleola*, see under that subspecies). Specimens from Colombia and Venezuela west of the easternmost Andean cordillera typically have a slightly narrower and paler orange DFW subapical marking, and thinner white postdiscal bands, while certain north Venezuelan specimens have broader white bands than usual and a narrower orange DFW subapical marking, more acute forewings, and the VHW postdiscal and submarginal series more straight and parallel (Fig. 60c,d - these specimens are marked † in the list of specimens examined). In northern Venezuela and Trinidad occur specimens that appear to be typical *A. iphiclus*, but intermediates are known to specimens which are much smaller, with wider white bands and a reduced orange DFW subapical marking. It is not clear whether these specimens represent a distinct subspecies of *A. iphiclus*, or *A. iphicleola leucates*, but I treat them as the latter in this work.

The taxonomic history of this species, one of the most common in the entire genus, is one of the most confused. The difficulties stem from Linnaeus' (1758: 486) all too brief original description of *Papilio iphiclus*, which may be quoted in its entirety (words and translation in square brackets by me): "*P.* [Papilio] *B.* [Barbarus] *alis angulatis: supra fuscis fascia alba, maculaque ferruginea anguli ani. 3. Habitat in Indiis. Macula magna ferruginea intra apicem alae primoris. Fascia alba ab angulo ani ad medium alae primoris ducta*" ["P. B. with angular wings: above dark brown, white band, and ferruginous spot at anal angle. 3. Habitat in the Indiis. Large ferruginous spot inside apex of forewings. White band leading from anal angle to middle of forewings"]. At first glance, this would seem to apply to *A. iphiclus* as treated here (from now on referred to as *A. iphiclus*), since Linnaeus mentions both a white band traversing the wings from the anal angle (of the hindwing, presumably) to the middle of the forewing and a *single*, large red-brown spot in the forewing apex. However, Clerck's (1764) figure on plate 41 of the dorsal and ventral surfaces of Linnaeus' *Papilio iphiclus* unquestionably represents the species *A. naxia*, which differs most notably on the DFW from *A. iphiclus* by having an additional orange subapical spot. Martin Honey (pers. comm.), who is completing a detailed examination of the Lepidoptera described by Linnaeus, is of the opinion that since Clerck supposedly figured the specimens on which Linnaeus based his descriptions, his figure should be taken to represent the type specimen. However, as Honey admits (pers. comm.), this view makes no allowance for subsequent usage and nomenclatural stability, the principal aim of the Code. Honey informs me that the type specimen of *Papilio iphiclus* is certainly lost, as Aurivillius (1882) stated, and that Butler's ([1870]) claim that the type of *iphiclus* is in the Linnaean collection in London is erroneous. The only specimen similar to *A. iphiclus* in the Linnaean collection was added at a later date and does not represent the type specimen, or even this species, in fact being the only known specimen of *A. thoasa calliphiclea*. Early authors varied as to their treatment of Linnaeus' *Papilio iphiclus*, and this merely served to compound subsequent confusion. Drury (1770: 27) referenced both Linnaeus' description and Clerck's figure, but figured both surfaces of a specimen from Surinam (pl. 14, fig. 3, 4) which is typical *A. iphiclus*. Despite the obvious differences between Drury's and Clerck's figures, both Cramer (1777) and Herbst (1793) referred to them as both representing *Papilio iphiclus*, but figured yet another unrelated species, *A. serpa diadochus*, under the name *Papilio iphiclus* (Cramer, 1777: 139, pl. 188, fig. E, F; Herbst, 1793: 138, pl. 148, fig. 3, 4). Herbst (1793: 137, pl. 148, fig. 1, 2) instead figured *A. iphiclus* under the name *Papilio cythereus* Linnaeus, while Cramer (1777: 139), having mistaken *A. serpa diadochus* for Linnaeus' *Papilio iphiclus*, clearly figured the ventral surface (plate 188, fig. D) and redescribed *A. iphiclus* as *Papilio basilea*, based on a specimen or specimens from Surinam. Cramer's types should be in either the RMNH or the BMNH (Vane-Wright, 1975), but they have not been located in either collection (G. Lamas, pers. comm.; pers. obs.). Hübner ([1819]: 42), in a list of species in his new genus *Adelpha*, also referred to Cramer's (1777) figure on plate 188, fig. E, F (=*A. serpa diadochus*) as representing Linnaeus' *iphiclus*, and without explanation emended Cramer's *Papilio basilea* to *Adelpha basilis*. Other authors referred to the figures of Drury (true *A. iphiclus*) and Clerck (true *A. naxia*) as both representing Linnaeus' *iphiclus* (Godart, [1824]; Westwood, 1850), while Westwood (1850) also went on to list Cramer's *basilea* as a distinct species, though how he thought it differed from Drury's figure is not clear. Authors following Westwood were divided in their treatment of the various names in circulation. Some used the name *iphiclus* in the sense that it is treated here (Hewitson, 1850; Bates, 1865; Felder & Felder, 1867; Butler, [1870]), while others used *basilea* to represent the same taxon (Ménétriès, 1857; Boisduval, 1870; Kirby, 1871) or, confusingly, to represent *A. naxia* (Bates, 1865; Godman & Salvin, 1884). Boisduval (1870) and Kirby (1871) both used *iphiclus* as the name for *A. naxia*, the species figured by Clerck, while the latter also synonymised two other distinct species with *iphiclus, A. basiloides* and *A. iphicleola*. It is clear, then, that considerable confusion surrounded the names *basilea* and *iphiclus*, and only Boisduval (1870) used *iphiclus* to apply exclusively to the species figured by Clerck (1764) as Linnaeus' *Papilio iphiclus*. Aurivillius (1882) finally put a stop to the confusion by designating Drury's (1770) figure as representing typical *A. iphiclus*, and listed *P. basilea* Cramer as also representing that species. Godman & Salvin (1884) appear to have been the last authors to use, or even mention, the name *basilea*, which they mistakenly applied to *A. naxia*, and all subsequent authors (Fruhstorfer, 1915; Hall, 1938; D'Abrera, 1987; DeVries, 1987; Neild, 1996; many other more general works and faunistic lists) have unanimously referred to the taxon treated here as *A. iphiclus* under that name.

Given the historical confusion discussed above, and absence of type specimens of both *Papilio iphiclus* and *Papilio basilea*, I believe it is in the interests of future nomenclatural stability to designate neotypes for both of these names. Although I have not tried to trace every single reference to these two names in the literature, I have tried to examine those during the century following their description that are most widely cited and figure specimens, thus allowing me to ascertain how the two names were treated. Since only Boisduval (1870), among early authors, seems to have unambiguously treated under the name *A. iphiclus* the species figured by Clerck (1764), whereas a number of other authors regarded Drury's figure as representing the Linnaean type, and since the name has been used in the latter sense for at least the last century, I believe that the neotype designation should reflect the more widespread usage of the name. Furthermore, Linnaeus' original description, which mentions only a single red-brown spot in the apex of the DFW, actually corresponds more closely to specimens of *A. iphiclus* than *A. naxia*, as treated here. It is also possible that Linnaeus based his description on specimens belonging to both *A. iphiclus* and *A. naxia*. Drury's figured specimen of *Papilio iphiclus* Linnaeus came from Surinam, as did Cramer's figured specimen of *Papilio basilea*, and I therefore choose to designate the same specimen as neotype for both names. Unfortunately, there are no specimens in the BMNH in good condition from Surinam, and I therefore designate a specimen from French Guiana, in the BMNH(M), drawer 16-101, which bears the following label data "Cayenne//Ex Oberthür Coll. Brit. Mus. 1927-3.", as the neotype for *Papilio iphiclus* and *Papilio basilea*. This specimen is figured (Fig. 60a,b) and corresponds well with Drury's figure, being typical of the species, as currently treated, in all respects.

Fruhstorfer (1915) described a new subspecies of *A. iphiclus*, *funalis*, from a single specimen from Río Dagua in western Colombia, which was at the time in the Tring Museum. The holotype male is now in the BMNH(R), in addition to four further specimens from the same locality. All of these differ from typical *A. i. iphiclus* in having a slightly narrower white postdiscal band (Fruhstorfer's claim that the white postdiscal band of both wings is reduced to half its normal width is an exaggeration) and narrower orange DFW subapical spots. *Adelpha iphiclus exanima* was described by Fruhstorfer (1915) based on an unspecified number of specimens from Venezuela. The syntype male in the BMNH(T) differs from typical *A. i. iphiclus* in having a narrower DFW orange subapical marking and slightly broader white postdiscal bands, as stated by Fruhstorfer. This phenotype is typical of specimens from northern and northwestern Venezuela, to which Neild (1996) tentatively applied the name, whilst pointing out the considerable difficulties in assessing variation given the inaccurate data and few specimens available from this biogeographically complex area. There is a second syntype in the BMNH(R) from Suapure, Venezuela, which may actually be a specimen of *A. iphicleola leucates*. Although it has broad white postdiscal bands and a narrow orange DFW subapical marking as in the first syntype, it originates from an area where one would expect typical *A. iphiclus* to occur. Since the first syntype was figured by Neild (1996) as *A. iphiclus exanima*, I designate that specimen as the lectotype of *Adelpha iphicla exanima*, with the following label data: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//122//Fruhstorfer Coll. B.M. 1937-285//iphicla exanima Fruhst.//Venezuela Fruhstorfer//TYPE//Type//Syntype". Finally, Fruhstorfer (1915) described *A. iphicla pharae* from specimens from Mato Grosso, Peru and Bolivia, as differing from the nominate subspecies in having a larger orange DFW subapical marking and broader white postdiscal bands. These differences are negligible in the several syntype specimens that I have located. I follow Willmott & Hall (1999) in considering all differences between *funalis*, *exanima*, *pharae* and nominate *iphiclus* to be too minor and variable to sustain the recognition of any of the first three names as valid subspecies, the second two of which were synonymised by Hall (1938), whilst recognising that more extensive collecting in future may well necessitate a review of this taxonomy. To this end, I have added footnotes by certain specimens in the list below that exhibit notable phenotypic differences from typical *A. i. iphiclus*.

Range: This very widespread taxon ranges from Mexico to the western slopes of the Cordillera Occidental in Colombia, to northwestern Venezuela, south to Bolivia, Amazonian Brazil as far south as the central Brazilian plateau in the state of Goiás, Paraguay, northeastern Argentina, the Guianas and Trinidad.

Immature stages: All of the early stage information known to date, except that of Moss (1933) for which I have identified voucher specimens, could apply to either this species or *A. iphicleola*, but I summarise it here for convenience and since the life histories of these two species are probably similar. Moss (1933) reared this species in Brazil (Pará), and figured both the last instar larva (pl. I, fig. 18) and the pupa (pl. II, fig. 10). Aiello (1984) also reared this species in Panama, and figured the final instar larva and its head capsule (figs. 2, 4) and the pupa (fig. 6). The egg is typical of the genus and may be deposited on the upperside, or, more rarely, the underside of the leaf, typically at the leaf tip but also at its margin. [NOTE: Comstock & Vázquez (1961) figured an egg under the name "*A. iphicla iphicleola*", reporting the hostplant *Celtis* (Ulmaceae), but suggested, correctly, that it probably belonged to *Doxocopa laure* (Apaturinae).] The colour of the larvae varies from dark grey, to golden brown, to almost black, and is not dependent on the hostplant. The head capsule has a relatively smooth face and long lateral spines, and also varies, from yellow-brown with black pits to uniform dark brown or black. Light individuals of the final instar have dark, oblique lateral stripes on A2-A5, and often white lateral marks on A2, A7 and A8. The A2 scolus has a broad base, and all the scoli are all relatively long and thin, with thin, tapering lateral spines, except for that on A1, which is reduced with no lateral spines. The pupa has a moderate projection on A2 and small, triangular head horns. It varies from waxy white to straw-coloured, and is often partly or entirely shining gold or silver, especially on the dorsal surface of T1, T3 and A1. Almost always there is a small silver diamond at the base of each mesothoracic leg. There are preserved head capsules and pupal cases in the USNM, collected by Small in Panama.

Janzen (*In*: DeVries, 1986: Costa Rica) reports that late instars are solitary and feed on all leaves of plants along forest or riparian edges or in light gaps. DeVries (1987) states that first to third instars make frass chains, and later instars either rest on these or on damaged portions of the leaves. A single larva observed by Aiello (1984) constructed an additional, curved, larva-form mass of frass on the upper surface of the leaf, as does *A. basiloides*. Full development times are given for all stages, and the total development time for three individuals was 29 days (Aiello, 1984: table 2).

Annette Aiello and Andrés Orellana (pers. comm.) report that in Panama in August, 1998, there was what appeared to be an outbreak of larvae of *A. iphiclus* or *A. iphicleola*. Larvae were abundant on the leaves of an *Antirrhoea* species, a roadside weed with broad leaves. Larval deaths were observed due to an unidentified bacteria/virus, parasitic Hymenoptera and predatory Hemiptera.

Habitat and adult ecology: This subspecies is one of the most frequently encountered *Adelpha* in South America, although it is less common in Central America than its close relative, *A. iphicleola*. It occurs in both secondary and primary forest, from sea level to 1250m, throughout the year, although adults are typically most abundant in the wet season. Males may be attracted to rotting fruit and excrement (Neild, 1996), and to rotting fish, and are frequently found puddling along wide sandy roads through secondary forest and at streams. According to specimen label data, a series of seven males and a female from Costa Rica in the AMNH were collected in June feeding on flowers of *Tridax procumbens* L., *Stachytarpheta jamaicense* (L.) and a species of *Melanthera*. Andrés Orellana (pers. comm.) reports that he found this species or *A. iphicleola* feeding at ripe and fermenting fruits hanging on a *Bunchosia cornifolia* (Malphigiaceae) tree in Panama in August, while Annette Aiello (pers. comm.) also reports adults to be attracted to fruits of *Antirrhoea trichantha*, the principal local larval hostplant. DeVries' (1987) observations in Costa Rica are of interest, but they could also apply to *A. iphicleola*, which he did not recognise as a distinct species. He reports that males perch along forest edges in groups, a behaviour that I have only observed in *A. iphicleola* in eastern Ecuador, while both sexes visit fruits of mango, *Guazuma* and *Genipa*. DeVries also observed individuals visiting flowers of *Vochysia* and *Paullinia* in the forest canopy. Pinheiro (1996) found this species to be palatable to kingbirds in Brazil.

Specimens examined (868♂, 125♀): † - specimens like lectotype *exanima* (Fig. 60c,d)), wide postdiscal bands, thin orange DFW subapical marking, acute forewing shape; ‡ - DFW orange subapical marking like *A. i. iphicleola*, ventral surface like *A. iphiclus*; * - trans. to *A. i. ephesa*; **?** – identification uncertain, wide postdiscal bands, DFW subapical marking typical *A. iphiclus*, wing shape like *A. iphicleola gortyna*.

MEXICO (45♂, 14♀): *Chiapas*: Cuauhtémoc Oct. 1♂ AME; Las Delicias Sep. 1♂ AME; Musté Jul. 9♂ AMNH; Ocozingo 1♂, 1♀ AME; San Carlos Jun. 1♀ AME; San Jerónimo 450m Aug. 1♂ FSCA; San Quintín Aug. 3♂ AME; *Guerrero*: Acahuizotla Jun. 1♂ AME; no specific locality 17♂, 2♀ BMNH; *Oaxaca*: Chiltepec Aug. 1♂ AME; *San Luís Potosí*: Tamazunchale Jul. 1♂ FSCA; Xilitla Nov. 1♂ AMNH; *Tamaulipas*: Mante, 30 mi. N., Nov. 1♂ USNM; *Veracruz*: Córdoba Jul. 1♀ AMNH; Cuesta de Misantla 4♀ BMNH; Motzorongo Jun. 1♂ USNM; Orizaba Jun. 1♂ AMNH, 1♂ AME; Presidio Aug. 1♂, 3♀ AME; Tezonapa 1♀ AME; Zongolica Jun. 1♂ BMNH; *Not located*: Isthmo de Tehuantepec 1♂ MCZ; no specific locality 1♀ BMNH, 1♂ AMNH. **GUATEMALA** (11♂, 3♀): *Alta Verapaz*: Choctún 1♂ BMNH; Polochic Valley 2♂ BMNH; *Izabal*: Cayuga Mar. 1♂ USNM; *Quezaltenango*: Volcán Santa María 4♂, 1♀ BMNH; *Santa Rosa*: Guazacapán 1♂ AME; *Not located*: W. Guatemala Aug. 1♂ MCZ; no specific locality 1♂, 1♀ BMNH, 1♀ MNHN. **BELIZE** (2♀): *Cayo*: Camp Sibún 200m Jul. 2♀ AME. **HONDURAS** (5♂, 2♀): *Comayagua*: Comayagua Jun. 1♀ MCZ; *Cortés*: San Pedro Sula 1♂, 1♀ BMNH; *Not located*: Central Honduras 1♂ AMNH; no specific locality 3♂ USNM. **NICARAGUA** (3♂, 4♀): *Managua*: Managua Oct. 1♀ AME; *Matagalpa*: Matagalpa 1♀ BMNH; *Chontales*: Chontales 1♀ BMNH; *Zelaya Sur*: El Bluff Jan. 1♂ BMNH; *Not located*: no specific locality 2♂ BMNH, 1♀ MCZ. **COSTA RICA** (24♂, 12♀): *Alajuela*: San Mateo Jul. 1♂ BMNH; *Cartago*: Cachí Jul. 3♂ BMNH; Irazú 1♂ BMNH; Juan Viñas Jun. 1♂ BMNH; Turrialba Jul. 2♂, 2♀ AME; *Guanacaste*: Cañas, 24 km N.W., Jun. 7♂, 1♀ AMNH; Finca Taboga Jun. 1♀ AME; Santa Rosa 100m Aug. 1♂ KWJH; *Heredia*: Puerto Viejo, 3 km S.W., May Oct. 1♂, 2♀ USNM; *Limón*: Port Limón Jan. 2♂, 1♀ USNM; Santa Clara Valley 1200' 1♀ BMNH; *Puntarenas*: Palmar Norte Jul. 1♂ USNM; Río Tarcoles 50m Sep. 1♂ KWJH; *San José*: San Isidro 1♀ MCZ; San José 1♀ BMNH, 1♂ MNHN; Villa Colón 750m Aug. 1♂ USNM; *Not located*: no specific locality 2♀ AMNH, 1♂ BMNH. **PANAMA** (26♂, 27♀): *Chiriquí*: Bugaba 1♂ BMNH; Chiriquí 2♂ BMNH, 1♂, 1♀ MCZ, 1♂‡ USNM; *Coclé*: El Valle 800m Aug. 1♀ USNM, 1♀ AMNH; *Colón*: Gamboa Jan. 2♀ USNM; Piña 100m Apr. 1♀ FSCA; *Darién*: Caña 900m Jul. Aug. 3♂(1‡), 2♀ USNM; *Los Santos*: Río Oria Jan. 2♀‡ USNM; *Panamá*: Arraiján Feb. Sep. 2♀ AMNH; Barro Colorado Island Feb. Sep. Dec. 2♂, 2♀ AMNH, 2♂, 1♀ MCZ; Cocolí Nov. 1♂ USNM; Farfán Jun. Dec. 3♂(1‡), 5♀(3‡) USNM, 1♂ AMNH; Fort Kobbe Jun. 2♂, 3♀ USNM; La Pita Jun. 1♂ USNM; Las Cumbres Oct. 1♂ FSCA; Río Bayano Nov. 1♂ USNM; Río Trinidad 1♂, 1♀ AMNH; *Not located*: Canal Zone Mar. 1♀ BMB; no specific locality 1♂, 1♀ MCZ, 1♂‡ USNM, 1♂, 1♀ AMNH. **VENEZUELA** (35♂, 1♀): *Amazonas*: Mt. Duida 1♂ AMNH; Puerto Ayacucho 100m 1♂ AFEN; Río Mavaca Mar. 1♂ AMNH; *Bolívar*: Caura 3♂ AFEN; El Dorado Jun. 5♂ FSCA; Javillal 100m Aug. 1♂ AFEN; Suapure 1♂ BMNH; *Carabobo*: Las Quiguas Nov.-Mar. 1♀† BMNH; San Estevan, près Puerto Cabello 7/1877 1♂† BMNH; *Distrito Federal*: Caracas 3000' Sep. Oct. 1♂ BMB; *Lara*: Quebrada Negra Yacambú 800m 1♂**?** AFEN; Sanare 4♂ MNHN; *Mérida*: Mérida 1♂ BMNH; *Sucre*: Patao, Güiria Aug. 1♂ BMNH; *Táchira*: Hda. Pánaga 800m 1♂† AFEN; La Morita 300m Aug. 1♂ MUSM; *Trujillo*: La Gira Betijoque 550m May 1♂**?** (postdiscal band greenish), Dec. 1♂† AFEN; *Zulia*: El Tucuco Jun. 1♂ USNM, 1♂† AFEN; *Not located*: Alto Orinoco 3♂ USNM; Morrisca Sep. 1♂ MCZ; Palo Alto Río Tigre Oct. 1♂ USNM-error; Sinistara del Sur 1♂ AMNH; no specific locality 2♂ BMNH, 3♂ MNHN. **COLOMBIA** (328♂, 24♀): *Amazonas*: Florida Nov. Dec. 2♂ BMNH; Puerto Nariño Dec. 2♂ LMC; *Antioquia*: Casabe, Río Magdalena 13♂, 2♀ AMNH; Medellín 3♂ AME, 1♀ USNM; Río Cocorná 1♂ AMNH; Valdivia Dec. 1♂ AMNH; *Boyacá*: Casanare 1♂ USNM; Minas de Muzo 1♂ BMNH; Muzo 1♂ BMNH, 17♂ AME, 21♂ MNHN; Otanche Nov. 2♂ JFL; *Caldas*: Guamocó 1♂ AMNH; Manizales 2♂ BMNH; Río de la Miel Jun. 1♂ ESM; Victoria Jan. Feb. 2♂ USNM; *Caquetá*: Montañita Jan. 1♂ USNM; Río Bodoquero Jan. 1♂ USNM; *Chocó*: Guarato Oct. 1♂ MUSM; *Cundinamarca*: Bogotá 90♂, 3♀ BMNH, 12♂ BMB, 3♂ MCZ, 5♂ USNM, 1♂ AMNH; env. Bogotá 12♂, 1♀ BMNH; Région du Bogotá 1♀ BMNH; Cananche Jun. 3♂ BMNH; La Mesa 4000' Jul. 2♂ BMB; La Vega 1900m Jan. 1♂ BMNH; Toquiza Apr. May 1♂ BMNH; *Cauca*: Pescador 1450m Feb. 5♂, 1♀ AME; *El César*: Atánquez, Santa Marta 750m Jul. 3♂†, 1♀† BMNH; El Jordán, Santa Marta 950m Jul. 1♂ BMNH; *Magdalena*: Onaca Santa Marta 2200' Sep. Oct. 6♂, 3♀ BMNH; Santa Marta 2♂ BMNH; *Meta*: Buenavista Jul. 1♂ AMNH; Peperital-Buenavista Jan. 1♂ BMNH; Remolinos Mar. 1♀ JFL; Restrepo Jul. 1♂ JFL; Río Ariari Aug. 1♂ LMC; Río Negro Jan. 1♂, 1♀ USNM; San José Guaviare 1♂ JFL; Villavicencio Feb. Jul. Aug. 3♂ AMNH, 1♀ USNM, 1♂ BMNH, 1♂, 1♀ AME, 1♂ MCZ; Villavicencio-Mt. Redondo Mar. Apr. 1♂ BMNH; *Putumayo*: Umbría 1♂ AMNH; *Risaralda*: Itaburi Jan. 2♂ AMNH; *Santander*: Barrancabermeja 2♂ AMNH; Carare Nov. 1♂ BMNH; La Borroscosa Dec. 1♂, 1♀ AMNH; Landázuri Jul. 2♀ AMNH; La Sevilla Dec. 1♂ AMNH; head Río Carare 2♂ USNM; Río Quirata Dec. 1♂ AMNH; *Tolima*: Río Chili 7-800m Dec. 1♂ AME; *Valle del Cauca*: Cali 1000m Dec. 1♀ AME; Juntas 1♂ BMB, 3♂ BMNH; Río Dagua 5♂ BMNH; *Not located*: Bogotá-Buenaventura Dec.-Feb. 1♂ BMNH; Cauca 1♂ BMNH, 1♂ AMNH; Río Magdalena 1♂ BMNH, 1♂ MNHN; San Rafael 3500' Jun. Jul. 2♂ BMB; no specific locality 52♂, 2♀ AMNH, 1♀ BMNH, 1♂ AME, 2♂ BMB, 3♂ MNHN, 2♂ MCZ, 6♂ USNM. **ECUADOR** (55♂, 2♀): *Morona-Santiago*: Bomboiza Nov. 2♂ DAT; Macas Oct. 3♂ BMNH, 2♂ MNHN; Méndez Oct. 1♂ MJP; *Napo*: Apuya 600m Oct. 1♂ KWJH, 1♂ DAT; Archidona Apr. 3♂ BMNH; Chichicorrumi 450m Sep. 1♂ KWJH; Coca, 35 km S.W., Apr. 2♂ MJP; Cotundo Oct. 1♂ USNM; Finca San Carlo 600m Sep. 1♂ KWJH; Guacamayos Sep. 1♂ DAT; Las Minas de Misahuallí 400m Jul. 1♂ KWJH; Napo 2♂ AME, 7♂ MNHN; Nushiño 1♂ BMNH; Río Chalayacu Sep. 1♂ DAT; Río Coca Jun. 3♂ AME; Río Napo Aug. Sep. 2♂ BMNH; Río Shandia 550m Sep. 1♂ KWJH; Río Tiputini Apr. 1♂ MJP; Santa Rosa Nov. 1♂ DAT; Satzayacu Sep. Oct. 2♂ DAT; *Pastaza*: Sarayacu 1♂ BMNH, 1♂ USNM; "*Pichincha*": Quito 1♂ MNHN-error; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Jan. Jul.-Nov. 2♂, 2♀ PJD; Río Aguarico 1♂ MNHN; *Tungurahua*: Río Topo Sep. 1♂ USNM; *Not located*: E. Ecuador 1♂ USNM, 2♂ KWJH; no specific locality 4♂ MCZ. **PERU** (183♂, 6♀): *Amazonas*: Falso Paquisha 800m Oct. 1♂ MUSM; Río Santiago Oct. 4♂ AMNH; *Cuzco*: Marcapata 1♂ BMNH; Río Urubamba Feb. 1♂ MUSM; *Huánuco*: Cord. del Sira Aug. Sep. 1050m 1♂, 1♀ MUSM; Las Palmas 450m Aug. 1♂ AME; Tingo María May Jul. Dec. 1♂ FSCA, 13♂ AME; Tournavista 2♂ AME; *Junín*: Chanchamayo 1♂ BMNH, 1♂ AME; La Merced 2500' Aug. 2♂ BMNH; Río Perené Jun. 1♂ AMNH, 1♂ BMNH, 1♂ BMB, 1♂ MNHN; San Ramón 1♂ MUSM; Satipo Jan. Oct. Nov. 5♂ AME, 1♂ AMNH; Satipo, 25 km N., 800m May 1♂ MUSM; *Loreto*: Arcadia 150m Nov. 3♂ MUSM; Caballo Cocha May-Jul. 3♂ BMNH; Castaña 150m Oct. 1♂ MUSM; Curaray 3♂ MNHN; Guepi May 1♂ MUSM; Iquitos Feb. Jul. Aug. Oct. 7♂ AMNH, 6♂ BMNH, 1♂ FSCA, 3♂ AME; lower Río Tapiche Jul. Aug. 11♂ AMNH; Pebas 5♂ BMNH; Río Cachiyacu 4♂ BMNH; Río Morona Jan. 1♂ AMNH; Río Sucusari 140m Sep. 11♂, 1♀ MUSM; upper Río Tapiche Aug. 2♂ AMNH; Yanamono Jul. Sep. 2♂ MUSM; *Madre de Dios*: Boca Río La Torre 300m Feb. Jul. Oct. Nov. 9♂, 1♀ MUSM; Pakitza 400m Sep.-Nov. 10♂ MUSM; Pampas del Heath 220m Jun. 1♂ MUSM; Puerto Maldonado 250m Aug. Oct. 1♂, 1♀ USNM, 2♂ AME; Puerto Maldonado, 30 km S., Oct. 1♂, 1♀ USNM; Río de Las Piedras Aug. 1♂ MUSM; Shintuya 460m Jul. 1♂ AME; *Pasco*: Alto Yurinaqui 1400m Nov. 1♂ MUSM; Pozuzo 800-1000m 3♂ BMNH; *Puno*: Chaquimayo 2500-3000' Jun.-Aug. Oct. 2♂ BMNH; La Unión 2000' Jan. 1♂ BMNH; San Gaban 2500' 2♂ BMNH; *San Martín*: Achinamiza Jun. Sep.-Dec. 6♂ AMNH; Jepelacio 1♂ AMNH; Rioja 1♂ MUSM; Tarapoto 1♂ BMNH; Yumbatos Sep. 1♀ MUSM; *Ucayali*: Boquerón Abad 600m Aug. Sep. 2♂ MUSM, 1♂ AME; Contamaná Dec. 1♂ BMNH; *Not located*: Río Huallaga 7♂ AMNH, 2♂ USNM; upper Río Marañón Nov. Dec. 5♂ AMNH; middle Río Ucayali Apr. 3♂ AMNH; Río Ucayali 2♂ BMNH; no specific locality 4♂ BMNH, 2♂ MCZ, 2♂ USNM, 1♂ AMNH, 1♂ JFL. **BOLIVIA** (42♂, 2♀): *Cochabamba*: Cochabamba 1♂ BMNH; El Palmar 1600m Apr. 1♂ AME; *El Beni*: Cachuela Esperanza Sep. 5♂ AME; Reyes Jun. 1♂ BMNH; *La Paz*: Chimato R. Apr. 2♂ AMNH; Coroico Mar. 5♂ AMNH, 1♀ MCZ; *Potosí*: Tupiza 1♂ AME; *Santa Cruz*: Buenavista Mar. Apr. 2♂ AME; forest between Santa Cruz and Tapirapuan plains Sep. 1♂ BMNH; Prov. Sara Mar.-Jun. 7♂ BMNH; Río Negro Aug. 1♂ AME; Santa Cruz botanical gdns. Dec. 1♂ AMNH; Santa Cruz de la Sierra Jul. 1♂ FSCA; *Not located*: Yungas 1♂ BMNH; no specific locality 2♂ AMNH, 1♀ MCZ. **BRAZIL** (70♂, 10♀): *Amazonas*: Benjamin Constant Oct. 4♂ AMNH; Caiari-Uaupés Nov. 5♂ AMNH; Ega Jan. Apr. Jul. Aug. 4♂ BMNH; Fonte Boa Jul. 1♂ BMNH; Humaitá 1♂ BMNH; Lábrea, Rio Purus Nov. 1♂ BMNH; lower Rio Madeira Jul.-Sep. 1♂ BMNH; Madeira 1♀ AMNH; San Antonio do Iça 1♀ MCZ; San Jõas, Solimões 1♂ BMNH; São Paulo de Olivença Aug. 3♂ BMNH; Tefé Oct. Dec. 2♂ BMNH, 1♂ AMNH; *Goiás*: Guyabera Nov. 1♂ BMNH; *Mato Grosso*: Buriti May 4♂ USNM; Chapada 1♂ BMNH, 1♂ USNM; Cuiabá 1♂* BMNH; lower Rio Arinos Jun. 1♂

BMNH; no specific locality 4♂ BMNH; *Mato Grosso do Sul*: Campo Grande Nov. 1♂* AMNH; Nivac 1♂* BMNH; *Minas Gerais*: Belo Horizonte-Brasília, km 500, 1♂ AME; Leitão May 1♂ USNM; *Pará*: Óbidos 4♂, 1♀ AMNH, 1♂, 1♀ BMNH; Pará 3♂, 3♀ BMNH; Santarém 1♂, 1♀ BMNH; Tapajós 1♀ BMNH; *Rondônia*: Cacaulândia Jan. Mar. Apr. Oct. Nov. 3♂ USNM, 1♂ FSCA, 10♂ AME, 1♂ KWJH; Jaru Aug. 1♂ AME; *Not located*: Brasilia 1♂ MCZ; no specific locality 2♂ BMNH, 1♂ MNHN, 1♀ AMNH. **PARAGUAY** (3♂): *Paraguarí*: Sapucay, W. Foster 31/X/04 3♂(1*) BMNH. **GUYANA** (2♂, 3♀): *Barima/Waini*: Mabaruma Dec. Jan. 1♀ BMB; *Cuyuni/Mazaruni*: Kartabo 1♀ AMNH; *Upper Takutu/Upper Essequibo*: Kuyuwini R. 1♂ AMNH; *Not located*: Demerara 1♀ BMNH; no specific locality 1♂ BMNH. **FRENCH GUIANA** (6♂, 3♀): *Cayenne*: Cayenne 4♂, 2♀ BMNH; *Not located*: no specific locality 2♂, 1♀ BMNH. **SURINAM** (4♀): *Brokopondo*: Berg-en-Dal Apr. 1♀ BMNH; Saramacca River May 1♀ BMNH; *Not located*: no specific locality 2♀ BMNH. **TRINIDAD** (9♂, 2♀): *Caroni*: Tabaquite Oct.-Dec. 1♂ BMB; *St. George*: Caura Aug. 2♂ BMNH; Macqueripe Bay 1♀ AMNH; *St. Patrick*: Cochrane Sep. 1♂**?** FSCA; Siparia Oct.-Dec. 1♂ BMB; *Not located*: no specific locality Oct.-Dec. 1♀ BMNH, 1♂ BMB, 3♂ MNHN. **COUNTRY UNKNOWN** (23♂, 4♀): Amazons 1♂, 1♀ USNM; Mexico? 1♀ BMNH; Peru/Bolivia frontier 1♂ MNHN; no specific locality 13♂ MCZ, 1♂, 1♀ BMNH, 3♂ AME, 4♂ MNHN, 1♀ MCZ.

Additional locality data: **MEXICO**: *Chiapas*: throughout - see de la Maza & de la Maza (1993); *Colima*: some records in Warren *et al*. (1998: as *A. iphiclus massilides*) may apply to this taxon. **BELIZE**: *Cayo*; *Orange Walk*; *Toledo* (Meerman, 1999). **ECUADOR**: *Morona-Santiago*: Bomboiza Oct.; Méndez-Santiago rd., km 40, Oct.; Río Shangaime Dec.; Santiago Sep.; *Napo*: Apuya Aug.-Dec.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Jul. Dec.; nr. Coca Oct.; Coca-Loreto rd., km 21, Mar.; Finca San Carlo Aug. Dec.; Pimpilala Sep.; Río Tiputini Mar. Jun. Sep.; Río Yuturi Oct.; Satzayacu Apr.; Tiputini Biodiversity Station Aug.; Yarina Jul.; Yasuní Jul. Aug.; *Pastaza*: Puyo-Canelos rd., km 30, Oct.; Río Llandia Dec.; *Sucumbíos*: Laguna de Pañacocha Oct.; Pañacocha Oct.; *Zamora-Chinchipe*: Quebrada Chorillos 1250m Nov. (Willmott & Hall, sight records). **BRAZIL**: *Distrito Federal*: Parque do Gama 1100m Jun.; Ribeirão da Contagem 850m Feb.; Sobradinho Woods 1050-1150m Feb.; *Goiás*: Anápolis 1000m Feb.; Campinas 800m Jan. Dec.; Chapada dos Veadeiros 1000m; Leopoldo Bulhões 1000m Mar.; Rio Maranhão 700m; Vianópolis 1000m Nov. (Brown & Mielke, 1967). **PARAGUAY**: *Alto Paraguay*; *Concepción*; *Amambay* (Kochalka *et al*., 1996).

Adelpha iphiclus estrecha Willmott & Hall, 1999

Figs. **60e,f**; 151a,b; *294*

Adelpha iphiclus estrecha Willmott & Hall (1999: 9, fig. 6a,b, 11, 16a,b)

TL: Ecuador. **Types** (all Ecuador): **BMNH**(M): **HT**♂: "Ecuador. Hewitson Coll. 79-69 Heterochroa 1//Ecua."; **AT**♀: "Ecuador. Hewitson Coll. 79-69 Heterochroa 2//Ecua."; **BMNH**(R): **PT**♂, **PT**♀: "Quevedo, W. Ecuador. (V. Buchwald)"; **BMB**: **PT**♂: "St. Ana Maria. Quevedo. Ecuador. I. von Buchwald"; **KWJH**: **PT**♂: Lita, ridge east of Río Baboso; **PT**♀: El Durango; **PT**♂, **PT**♀: San Lorenzo-Lita rd., km 18; **PT**♂: San Lorenzo-Lita rd., km 20; **PT**♂: La Punta, km 44 Lita-San Loranzo rd.; 6**PT**♂: Río Tanti; **USNM**: "Alluriquín, 700m, Pichincha, Ecuador 28 Aug. 77 S.S. Nicolay"; **AMNH**: **PT**♂: "Ecuador//Coll. Frank Johnson"; **PT**♂: "Oriente Ecuador//Coll. Frank Johnson".

Adelpha iphicla funalis Fruhst., Strand (1918)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the much thinner postdiscal band that has a pale bluish tint and narrows anteriorly on the DFW, with the spot in cell Cu$_1$-M$_3$ being the widest, in addition to the more falcate forewing and reduced orange DFW subapical marking. There is slight variation in the width of the postdiscal band, in some specimens being considerably narrower than the figured paratype (Fig. 60e,f), but specimens with the broadest bands are still clearly distinct from *A. iphiclus iphiclus*.

A single specimen of this subspecies in the BMB has an Arthur Hall manuscript name, A. tenuivittata, attached to it, but this name was never described. Strand (1918) referred to it as *A. iphicla funalis*, a synonym of the nominate subspecies, probably based on Fruhstorfer's exaggerated original description of *funalis*. This taxon is regarded as conspecific with *A. iphiclus*, rather than *A. iphicleola* which the wing shape resembles, because of west Colombian specimens of *A. iphiclus* which have slightly more falcate wings and thinner postdiscal bands than typical *A. iphiclus*, the shape of the orange DFW subapical marking, and the apparent presence in western Ecuador of *A. iphicleola gortyna* or a new subspecies of *A. iphicleola* (see Willmott & Hall, 1999).

Range: West of the Andes in Ecuador, from the extreme north to the Quevedo area. Although this subspecies has not been recorded to date from southwestern Colombia, it probably occurs there.

Habitat and adult ecology: This subspecies is not uncommon in the wet season and early dry season from May to August, in association with disturbed primary and secondary forest, from sea level to 1000m. Both sexes may be found feeding at flowering bushes along forest edges, while males are attracted to rotting fish in ridge top forest light gaps. I have found males perching in ridge top forest light gaps 3m above the ground, and females flying along forest edges, or even roadsides. The parallel development of a thinner discal band and reduced orange DFW subapical marking in a number of western Ecuador *Adelpha* species (*A. serpa duiliae*, *A. basiloides*, *A. barnesia*, *A. iphicleola*, *A. erotia* form "lerna") suggests that these taxa are involved in mimicry.

Specimens examined (16♂, 4♀):

ECUADOR (16♂, 4♀): *Carchi*: Lita, ridge east of Río Baboso 900-1050m Jul. 1♂ KWJH; *Esmeraldas*: El Durango 400m Jul. 1♀ KWJH; San Lorenzo-Lita rd., km 18, 100m Jul. 1♂, 1♀ KWJH; San Lorenzo-Lita rd., km 20, 100m Aug. 1♂ KWJH; La Punta, km 44 Lita-San Lorenzo rd. 300m Aug. 1♂ KWJH; *Los Ríos*: Quevedo 1♂, 1♀ BMNH; St. Ana María, Quevedo 1♂ BMB; *Pichincha*: Alluriquín 700m Aug. 1♂ USNM; Río Tanti 750m May Jul.-Sep. 6♂ KWJH; *Not located*: "Oriente" 1♂ AMNH-error; no specific locality 1♂, 1♀ BMNH, 1♂ AMNH.

Additional locality data: **ECUADOR**: *Esmeraldas*: El Durango 300m Jul.; Mina Vieja, c. km 46 Lita-San Lorenzo rd. 300m Jul.; *Pichincha*: Río Tanti Jun. (Willmott & Hall, sight records).; *Chimborazo*: Los Llanos 1400m (Strand, 1918).

Adelpha iphiclus ephesa (Ménétriès, 1857)

Figs. **60g,h**; *294*

Heterochroa ephesa Ménétriès (1857: 104, pl. IX, fig. 2)

TL: Brazil. **Types**: **ZISP**: **LT**♂(?): "Bras.//Lectotypus Heterochroa ephesa Ménétriès, Lectotypus ♂ 1875 design. A. Lvovsky" [photograph examined]; **PLT**♂: "Bras." [not examined]; 2**PLT**: [not located]

=*Adelpha iphicla gellia* Fruhstorfer (1915: 523)

TL: Santa Catharina, to São Paulo [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//iphicla gellia Fruhst.//Brasilien Blumenau Fruhstorfer//TYPE//Type//Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//iphicla gellia Fruhst.//Brasilien Blumenau Fruhstorfer//TYPE//Type" [both examined]

=*Adelpha abyla abylina* Fruhstorfer (1915: 524)

TL: French Guiana; Brazil. **Types**: **MNHN**?: **ST**♀?: [not located]

Nymphalis iphicla Godt. [sic], Lucas (1835: 126, pl. 68); *Adelpha basilea* var. *ephesa* Mén., Kirby (1871); *Adelpha iphicla ephesa* Mén., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by having a larger orange DFW subapical marking, that typically broadly borders along vein M$_3$ or is at least represented in cell M$_3$-M$_2$ as a broad, triangle, instead of a small, attenuated point at the distal edge of the marking. The white postdiscal band is typically narrower. *Adelpha iphicleola leucates* is very similar, but it tends to have more pointed forewings, a straighter distal margin on the hindwing, noticeably broader postdiscal bands which are typically of equal width to the orange DFW subapical marking and broadest in cell Cu$_1$-M$_3$, instead of tapering, the distal edge of the orange DFW subapical marking in cell M$_1$-R$_5$ is typically concave rather than straight, the ventral surface has more heavily marked pale postdiscal and submarginal series and so appears lighter in colour, the pale VFW subapical marking is less obscured by brown scaling along the veins and the basal and distal edges are more clearly defined. The extent of the orange DFW subapical marking is variable in *A. i. ephesa*, either extending to border vein M$_3$, or just to touch it, while in some specimens orange continues as dashes down the outer postdiscal series in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$, a diagnostic character not found in any *A. iphicleola* examined, occurring particularly in specimens from São Paulo and Santa Catharina. The width of the white postdiscal band varies slightly, generally being thinner in specimens from São Paulo and Santa Catharina.

Ménétriès (1855: 33, n. 575) first introduced the name *ephesa* as a *nomen nudum* in a catalogue of specimens in the collection of the ZISP, then described and figured it two years later (Ménétriès, 1857) based on four specimens collected in Brazil. The description compares the subspecies with Cramer's figure of *Papilio basilea* (=*A. iphiclus*), but fails to note the only constant difference between this and the nominate subspecies, namely the larger orange DFW subapical marking. In fact, Ménétriès claims that this marking is smaller. The figure shows both surfaces of a specimen which has characters typical of this subspecies that distinguish it from the similar, possibly sympatric *A. iphicleola leucates*, including a relatively thin white postdiscal band and an orange DFW subapical marking that extends to the midpoint of cell M_3-M_2 in its basal half, and to vein M_3 in its distal half. I have also examined a photograph of a syntype specimen, courtesy of Anton Lvovsky, which differs from the original illustration in having a slightly broader orange DFW subapical marking extending to vein M_3 along most of its length, a character found in many specimens of this taxon. Since it is just possible that specimens of *A. iphicleola leucates* may be included within the type series, I designate this syntype specimen as the lectotype of *Heterochroa ephesa*, which bears the following label data: "Bras.//Lectotypus Heterochroa ephesa Ménétriès, Lectotypus ♂ 1875 [sic] design. A. Lvovsky". According to Lvovsky (pers. comm.), the specimen was placed above the following label in the drawer: "Ephesa nob. Brasil", in addition to a second syntype male specimen, simply bearing the label "Bras.". Fruhstorfer (1915) described *A. iphicla gellia* from an unspecified number of specimens from São Paulo to Santa Catharina, supposedly differing from *ephesa* in having a darker ventral surface and narrower postdiscal bands. Both of these differences are apparent in the two syntypes examined (Fig. 60g,h), but since they are minor and variable I agree with Hall (1938), who synonymised *gellia* with *ephesa*. There are other potential syntypes lacking both handwritten identification and type labels from Fruhstorfer's collection in the BMNH (Blumenau, 1♂, 1♀; São Paulo, 1♂; Espírito Santo, 1♀), all of which are typical *A. i. ephesa*. Lucas (1835) figured the dorsal surface of an *Adelpha* on plate 68, as *Nymphalis iphicla*, which he claimed was from French Guiana and Brazil. The figure shows a specimen very similar to the syntype female of *A. iphiclus gellia*, with an enlarged orange DFW subapical marking extending as dashes along the outer postdiscal series into cell Cu_2-Cu_1. Fruhstorfer (1915) however, without giving any explicit reason, regarded the figure as representing a new subspecies of *A. abyla*, which he named *abylina*, and this name was duly and correctly synonymised by Hall (1938) with *ephesa*. The type of *abylina* should be in the MNHN (Horn & Kahle, 1935-37), but I have not been able to locate it.

Although this taxon has an orange DFW subapical marking typical of subspecies of *A. iphicleola*, it otherwise has characters typical of *A. iphiclus*, such as the rounded wing shape and a pale VFW subapical marking that is more obscured by red-brown scaling and less sharply defined. Furthermore, there are rare specimens of *A. i. iphiclus* (e.g., one male, Peru, Boquerón Abad in the AME) which have the orange DFW subapical marking extending as dashes along the outer postdiscal series into cell Cu_2-Cu_1, in addition to similar specimens from probable blend zones, such as Paraguay and Mato Grosso. These strongly suggest that *ephesa* should be regarded as a subspecies of *A. iphiclus*.

Range: Eastern to southeastern Brazil, to Paraguay. Hayward (1931) figured a sketch of "*A. iphicla indefecta*" from Alto Paraná, and later (Hayward, 1973) reported the taxon from Misiones and Formosa, Argentina; the sketch (Hayward, 1931) shows the typically narrow DFW postdiscal band of *A. iphiclus ephesa*, compared with *A. iphicleola leucates*, and I tentatively identify it as the former.

Immature stages: Müller (1886) reported a species, "*A. iphicla*", from Santa Catharina, Brazil, to feed on *Bathysa* nr. *barbinervis*; this record might also apply to *A. iphicleola leucates*, but since *A. iphiclus ephesa* is clearly much more common in Santa Catharina, it most probably applies to the latter species. Müller (1886) also reported "*A. basilea*" to feed on *Calycophyllum* (Rubiaceae). Since *basilea* is a synonym of *iphiclus*, it is not possible to say to which species Müller was referring, but if his "*iphicla*" did not refer to this taxon, then it may be that his "*basilea*" did.

According to Müller (1886), the egg is deposited on the underside of the leaf at the tip. The larva is in general form similar to *A. lycorias lycorias*, with a dark transverse band on segment A2 as well as on segments A3-7, a tapering lateral stripe from T1-A2 and dark colouring on the dorsal surface in segment A7. The pupa has indistinct dorsal projections in the position of the scoli on segments T2, with more pronounced projections on A2-A4. Both D'Almeida's (1933) and Hoffmann's (1937b) description of the early stages of "*A. iphicla ephesa*" and "*A. iphicla-gellia*", respectively, probably also apply to this species. According to D'Almeida, the egg is pale yellow and deposited singly on the upper surface of the leaf near the tip. The first instar turns from whitish yellow to grey, with a pale brown head, the second instar is brown with small yellow "warts", and scoli begin to develop as spiny tubercles. The fourth instar is black on the first 4-5 segments and brown on remaining segments, with oblique black and yellowish stripes and yellowish "warts". The scoli and head capsule are black, the latter with dark yellowish chalazae and spines. The fifth instar is black with yellowish "warts" and scoli of similar or more greenish colour, darker towards the base, with those on T2 and T3 more reddish yellow. Both authors stated the scoli to be best developed on T2 and T3, with those on A7 and A8 larger than other abdominal scoli, and greenish at the base with reddish brown lateral spines (D'Almeida). The scoli on A10 are short, broad and black. The supraspiracular and subspiracular scoli are also present but very short, with the latter whitish yellow in colour. The head capsule is black with four small chalazae and numerous small pits, ringed with two rows of short, yellowish spines. Later the ground colour of the larva becomes yellowish brown turning partly reddish, with lateral oblique black markings, which towards pupation becomes a more or less reddish brown with black markings, or green markings on the four posterior segments. Dorsally, there is a reddish pattern consisting of several indistinct transverse rays extending from T2 to A2. The pupa has dorsal projections at A2 and T2, the former rounded and the latter pointed, and small conical head horns. It is dark brown (D'Almeida) or dark golden (Hoffmann), marbled with pale brown, paler on the wing pads and ventral surface, with dorsal gold markings and a silver streak ventrally at the base of the antennae (D'Almeida). Segments T2, T3 and A2 have small conical lateral projections, and the pupa is said to resemble that of *A. syma*

(Hoffmann).

The larvae retained the leaf mid-rib where they rested. Development times were as follows: 1st instar, 3 days; 2nd instar, 4 days; 3rd instar, 4 days; 4th instar, 5 days; 5th instar, 9 and 7 days; pupa, 8 days (2 individuals, D'Almeida) – 10 days (Hoffmann).

Habitat and adult ecology: Brown (1992) reports that this subspecies is common in disturbed forest areas, particularly at forest and stream margins, in the Serra do Japi, São Paulo. It is common in a wide variety of habitats, from humid, undisturbed forest along streams to open fields and gardens, and can also be found hill topping. D'Almeida (1933) reported the species to be common in hilly areas around Rio de Janeiro, and observed that the female held the wings closed while ovipositing. The subspecies has been recorded up to 1000m (Brown, 1992) and appears to fly throughout the year. Both author's comments may also apply in part to *A. iphicleola leucates*.

Specimens examined (62♂, 38♀): † - trans. to *A. i. iphiclus*.
BRAZIL (60♂, 37♀): *Bahia*: Cachimbo 1♂ BMNH; *Espírito Santo*: Leopoldina 1♀ BMNH; Linhares May-Sep. 6♂, 16♀ AME; Baixo Guandú Dec. 1♂ AME; Santa Cruz Feb. 1♀ AME; no specific locality 1♀ BMNH; *Goiás*: Goyaz 5♂ BMNH; Serra Dourada 1♂ AME; *Maranhão*: Montes Aureos 1♂ BMNH; *Mato Grosso*: Cuiabá-Corumbá river system 1♂† BMNH; Villa María-Diamantino Jan. 1♂ BMNH; *Minas Gerais*: Anápolis Apr. 1♂ AME; Mariana 1♂ AME; San Jacinto 1♂ BMNH; no specific locality 1♂ BMNH; *Rio de Janeiro*: Canto Gallo 1♀ MCZ; Corcovado 1♂ BMNH; Itabapoana 2♂, 1♀ BMNH, 1♀ MCZ; Itatiatia Mts. 3♂ MCZ; Laguna de Sacuarema 1♂ BMNH; Petrópolis 1♂ BMNH; P.N. da Tijuca Feb. 1♀ USNM; Rio das Ostras 1♂ AME; Rio Janeiro Apr. May Jul. 2♂, 1♀ AMNH, 1♂, 3♀ BMNH, 4♂ MNHN, 1♂, 1♀ MCZ, 1♂ USNM; Rio Teresópolis Jun. 1♀ AME; *Santa Catharina*: Rio Julio, 30 km N.W. Joinville 2500' Mar. 1♂ FSCA; Blumenau 1♂, 1♀ BMNH; Brusque Jul. 1♂ AME; Corupá 1♂ AMNH; no specific locality 1♂, 2♀ MCZ, 1♂ BMNH, 2♂ BMB, 1♀ AMNH; *São Paulo*: Anhangahy Nov. 1♂ BMNH; Araçatuba 450m Mar. 2♂ BMNH; Mendes 1♂ AME; Rio Pardo 2♂ BMB; São Paulo 2500' Oct.-Dec. 1♂ MCZ, 1♂ BMNH, 1♀ BMB, 1♂ USNM; *Not located*: no specific locality 2♂ MNHN, 1♂, 1♀ MCZ, 1♂ BMNH. **PARAGUAY** (2♂): *Central*: Asunción 1♂ MNHN; Santísima Trinidad Jul. 1♂ AMNH. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ MCZ.

Additional locality data: **BRAZIL**: *Minas Gerais*: Passa Quatro (Zikán & Zikán, 1968). *Santa Catharina*: Jaraguá Apr. May Jul. Aug. (Hoffmann, 1936); *São Paulo*: Serra do Japi (Brown, 1992).

Adelpha iphicleola (H. W. Bates, 1864)

Figs. **61**; 152; 235; *295*

Identification, taxonomy and variation:

This species cannot be distinguished from its sister species *A. iphiclus* by any single character, but I have, as in *A. iphiclus*, grouped taxa on the basis of characters shared with neighbouring taxa. In Central America, *A. iphicleola* is distinguished from *A. iphiclus* by having a more extensive orange DFW subapical marking, which extends to broadly border along vein M_3, instead of entering cell M_3-M_2 just as a narrow dash at the distal edge of the marking. In *A. iphicleola* the distal edge of the marking in cells M_3-M_2 and M_1-R_5 is typically concave, whereas in *A. iphiclus* the edge is straight or convexly rounded. The forewing and hindwing are typically more triangular than rounded, the forewing more falcate and the hindwing distal margin straighter but more dentate in *A. iphicleola* than in *A. iphiclus*. The white DFW postdiscal band on the DFW, in *A. iphicleola*, often broadens from the anal margin to cell Cu_1-M_3, so that the spot in cell Cu_1-M_3 is the widest, whereas in *A. iphiclus* it is usually slightly tapering from the anal margin to cell Cu_1-M_3. On the VFW, *A. iphicleola* has the pale subapical marking less obscured with red-brown scaling along the veins and around the edges of the marking, so that it is more sharply defined against the dark ground colour of the wing, while in *A. iphiclus* the ground colour at the basal edge of the marking is usually dark red-brown instead of black. The shape of the distal edges of the marking mirrors that of the forewing but is sometimes more obvious. The pale dashes which compose the VFW postdiscal series are typically more concavely curved in each cell in *A. iphicleola* than *A. iphiclus*, while on the VHW the inner and outer postdiscal series converge at vein M_3, where the inner series is marked more brightly with white; in *A. iphiclus* the series are more parallel and evenly marked with white. Many of the ventral characters are slightly variable, but if present enable identification. The enlarged orange DFW subapical marking helps to distinguish this species from *A. iphiclus* in the Amazon basin, while the ventral characters typical of *A. iphicleola iphicleola* also occur in various other subspecies. I discuss my rationale for considering each taxon as conspecific with the nominate subspecies in each account.

There is variation in the width of the postdiscal band, the size of the orange DFW subapical marking, and the expression of the ventral characters typical of the nominate subspecies, and I have recognised five subspecies. Several of these are only slightly differentiated and future collecting may show them to be merely part of clinal variation. For the present I recognise such subspecies to facilitate future identification and the study of the true nature of variation in this species.

This species has typically been regarded as a form or subspecies of *A. iphiclus*. However, throughout western Central America, and in eastern Ecuador, there occur specimens which are clearly phenotypically stable, sympatric with and consistently distinct from *A. iphiclus*. Closer examination of series of supposed *A. iphiclus* revealed the presence of two phenotypes in several other areas of the Neotropics, leading to the preliminary taxonomic arrangement adopted here, which was first proposed by Willmott & Hall (1999).

Range and status: Mexico to western Ecuador, eastern Ecuador to northeastern Peru, northwestern Venezuela and coastal areas of Venezuela to eastern Brazil, Paraguay and Trinidad. An isolated subspecies occurs on the island of Cuba. Very common in disturbed forest in Central America, uncommon to rare everywhere else, from sea level to 1500m.

Specimens examined: 786 (501♂, 285♀)

Adelpha iphicleola iphicleola (H. W. Bates, 1864)

Figs. **61a,b**; 235a,b; *295*

Heterochroa iphicleola Bates (1864: 128)

TL: Guatemala. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//131//B.C.A. Lep. Rhop. Adelpha iphicla Linn. Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9835 Heterochroa iphicleola ♂ Bates//Heterochroa iphicleola Bates Type//Guatemala// Polochic Valley F.D.G. & O.S.//♂//Type H.T.//Syntype"; **ST**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//132//B.C.A. Lep. Rhop. Adelpha iphicla Linn. Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9836 Heterochroa iphicleola ♀ Bates//Heterochroa iphicleola Bates Type//Polochic Valley F.D.G. & O.S.//♀//Type H.T."; **BMNH**(M): **ST**?♂: "Pacific slope//iphicleola[red label]//B.C.A. Lep. Rhop. Adelpha iphicla Linn. Godman-Salvin Coll. 1916.-4.//♂//Pacific Coast Guatemala F.D.G. & O.S." [all examined]

=*Adelpha iphicla massilides* Fruhstorfer (1915: 523)

TL: Western Mexico. **Types**: **BMNH**(T): **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//iphicla massilides Fruhst.//W. Mexico Fruhstorfer//TYPE//Type//Syntype" [examined]

Adelpha iphicla var. *iphicleola* Bates, Kirby (1871); *Adelpha iphicla massilia* Fldr., Fruhstorfer (1915) misid.; *Adelpha iphicla basiloides* Bates, Hall (1938) in part, misid.; *Adelpha massilia* Fldr., Beutelspacher (1976: fig. 4A, 5A), de la Maza (1987), Austin (1992), de la Maza & de la Maza (1993) misid.; *Adelpha iphicleola iphicleola* Bates, Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from the neighbouring *A. iphicleola gortyna* by typically having a larger orange subapical marking in cell M_3-M_2, in addition to the ventral surface characters that distinguish *A. iphicleola iphicleola* from *A. iphiclus* (discussed under general identification of *A. iphicleola*). Other distinguishing characters are discussed under each respective subspecies. There is some individual variation in the width of the white postdiscal band and therefore the spacing of the postdiscal and submarginal series on the ventral surface.

Bates (1864) described this species based on an unspecified number of male and female specimens from Guatemala, distinguishing it from *A. iphiclus* by the shape of the orange DFW subapical marking, in addition to several other characters listed above. He also mentions the presence of a "slender arcuated rufous line" in the VHW discal cell, actually the third cell bar, which may or may not be fused with the red-brown line at the basal edge of the white postdiscal band, and therefore this is not a constant character. I have examined the syntype male (Fig. 61a,b) and female in the BMNH and a further possible syntype male, and all are referable to this taxon. Fruhstorfer (1915) described *massilides* as a subspecies of *A. iphiclus* based on a specimen or specimens from western Mexico, and a syntype female is in the BMNH. It differs in no appreciable way from typical *A. iphicleola*, and the name was synonymised by Hall (1938), but then resurrected to full species status by Beutelspacher (1976). This was due to a misidentification by Beutelspacher of typical *A. naxia*, and the name was once again returned to synonymy by Neild (1996).

Adelpha iphicleola has had an ignominious taxonomic history, being usually treated as the Central American subspecies of *A. iphiclus* (Fruhstorfer, 1915; DeVries, 1987; D'Abrera, 1987; Lamas & Small, 1992), and remaining unrecognised as a distinct species until Austin (1992) figured it alongside typical *A. iphiclus* from Costa Rica. Fruhstorfer (1913, 1915) treated the taxon as *massilia*, with the result that the majority of subsequent authors referred to it under this name, including Austin (1992). Neild (1996) was the first author since Bates' original description to treat the species as distinct with the correct name (see Willmott & Hall, 1999).

Range: Mexico to eastern Panama, intergrading to *A. iphicleola gortyna* from Costa Rica to western Panama.

Immature stages: Almost certainly some of the hostplants records for *A. iphiclus* actually apply to this species, but given their close relationship the two probably share the same hostplants anyway. Similarly, the early stages of the species have probably been reared and reported under the name *A. iphiclus*. Given the phenotypic similarity of the adults there will probably prove to be no discernible differences in the early stages, and I summarise the available information under *A. iphiclus*.

Habitat and adult ecology: This is possibly the most common *Adelpha* species in the western parts of its range, extending from sea level to 1500m in humid and subhumid evergreen and semideciduous forest, where it flies throughout the year (de la Maza, 1987; de la Maza & de la Maza, 1993). Austin *et al.* (1996, as *massilia*) record it from a complete range of habitats in Guatemala, from fields and second growth to primary forest, where it is common throughout the year. In Costa Rica it is most frequently encountered in drier areas on the Pacific slope, where it flies with *A. iphiclus*, but it always appears to be more abundant than this species (Austin, 1992). DeVries (1987) reports various observations in Costa Rica under the name *A. iphiclus*, but these may apply to either that species or this (see the equivalent section under *A. iphiclus*). A single male in the AMNH was captured in Costa Rica on flowers of *Cordia*.

Specimens examined (310♂, 143♀): † - trans. to *gortyna*.

MEXICO (215♂, 92♀): *Campeche*: Campeche Jul. 2♂ AMNH; Chiccaná Ruins 1♂ AMNH; China Oct. 1♂ AMNH; Escarcega Aug. 1♂ FSCA; *Chiapas*: Campet Aug. 1♀ AME; Chajul, Río Lacuntún 200m Jul. 1♂ KWJH; Comitán Aug. 2♂ AME; Cuauhtémoc Sep. 2♂ AME; El Chorreadero Oct. 1♂ MUSM; El Sumidero Oct. 1♀ MUSM; La Chacona Aug. 2♂ MUSM; Las Delicias Jun.-Sep. 5♂ AMNH, 2♂, 1♀ AME; Mazatán Jul. 1♀ AME; Paraíso Oct. 1♂ AME; Musté Jul. 3♂ AMNH; Ocozocoautla Feb. 1♀ AMNH; Pínola Sep. 2♂ AME; Rancho Santa Ana Jun. 2♂ AMNH; Río Chixoy Aug. 2♂ AME; San Antonio Buenavista 1500m Aug. 1♀ MUSM; San Carlos Jul. 3♂, 2♀ AME; San Cristóbal de las Casas Jan. Feb. Aug. 1♂, 1♀ AMNH, 2♂ AME; San Jerónimo 600m Aug. 1♂ USNM; San Quintín Aug. Sep. 4♂ AME; Tapachula Aug. 1♂ AME; 1♂, 1♀ AMNH; Tonags Jan. 1♂ AMNH; no specific locality Jul. Sep. 4♂, 4♀ AMNH, 1♂ FSCA, 2♂ AME, 1♀ MNHN; *Colima*: Comalá 2100' Oct. 1♂, 1♀ AME; La Salada 1000' Jan. 1♂ AME; *Guerrero*: Acahuizotla Sep.-Nov. 1♀ BMNH, 3♂, 1♀ AME; Acapulco Sep. 4♂ AMNH, 1♀ AME; Chilpancingo Aug. 1200m 4♂ AMNH, 1♀ BMNH; Colotlipa 1020m Aug. 1♂ AME; Dos Arroyos 1000m Sep. 1♀ BMNH; El Treinte Sep. 2♂, 1♀ AMNH; Iguala 2♂ AMNH; Tierra Colorada 500m Aug. 1♂ AME; Zihuatenejo Dec. 1♂ AMNH; no specific locality 21♂, 1♀ BMNH, 1♂ USNM; *Jalisco*: Cumbre 1♀ AMNH; Magdalena 1380m Aug. 1♀ AME; Puerto Vallarta Oct. 1♀ USNM; San Luis Allende-Ayutla Aug. 2♂ BMNH; Tenacatitla 1♀ AMNH; *Michoacán*: Coahuayana Aug. 3♂, 4♀ AME; *Morelos*: Amacuzac Aug. 1♀ AMNH; *Nayarit*: Compostela Aug. 1♀ AME; Tepic 1♂ BMNH, 1♂ MNHN; Zapata 900m Aug. 1♂, 2♀ AME; no specific locality Oct. 1♀ AMNH; *Oaxaca*: Candelaria Loxicha 550m Aug.-Nov. 6♂, 4♀ AMNH, 1♂ USNM, 1♀ FSCA, 3♂, 1♀ AME; Chiltepec Aug. Oct. 2♂ AMNH, 2♂ AME; Comaltepec Oct. 1♂ AMNH; Espinal Jun. 1♀ BMNH; Juchatengo Dec. 1♀ AMNH; Mixtepec Dec. 1♂ AMNH; Naranjal-Chiltepec 6♂ AMNH; Oaxaca Aug. 1♀ BMNH, 1♀ USNM, 1♂, 2♀ AME; Rancho San Carlos Aug. 1♂ AMNH; Salina Cruz Jun. Jul. 1♀ BMB; Soyolapan el Bajo May 1♂, 1♀ AMNH; Valle Nacional 800m Jul. 1♂ MUSM, 1♀ AMNH; *Puebla*: Villa Juárez 1♀ AME; *Quintana Roo*: X-Can May Jul. Oct. 2♀ FSCA, 1♂ AMNH; *Sinaloa*: Mazatlán 30m Aug. 1♂ BMNH, 3♂, 3♀ AME; Papachal Dec. 1♀ AMNH; Sinaloa Feb. 2♂ AMNH; Sinaloa, 24 mi. N.W., 15 Jun. 1♂ AMNH; *Tabasco*: La Venta 10m Jan. 1♂ AME; Tepescuintla Aug-Oct. 15♂, 3♀ AMNH; *Veracruz*: Atoyac 1♂ BMNH; Coatepec 2♀ USNM; Córdoba Mar. Sep. Dec. 2♂ AMNH, 2♂ USNM, 1♂ BMNH; Fortín Aug. 1♂ AMNH; Jalapa May 1♂ BMNH, 4♂ USNM; Motzorongo 1♀ USNM; Nanchital sea level Feb. 1♂ AME; Orizaba 1♂ BMNH; Palo Gaucho Aug. 1♂ USNM; Popoctepetl Tuxtla 400m Oct. 1♂ MUSM; Presidio Jul.-Sep. 3♂, 1♀ AME, 3♂ USNM, 1♀ AMNH; Tezonapa Jul. 1♂ AME, 1♂ AMNH; Zongolica Jun. 2♂ BMNH; *Yucatán*: Dolores Otero Jul. 1♀ AMNH; Mérida Jul. 1♀ AMNH; Pisté Jul.-Sep. 18♂, 6♀ AMNH, 7♂, 4♀ AME, 4♂, 1♀ FSCA, 1♂ BMNH, 1♀ USNM; Tekax Sep. 1♂ AMNH; Tzitas 1♀ AMNH; Valladolid 1♂, 1♀ BMNH; *Not located*: W. Mexico 1♀ BMNH; no specific locality 4♀ AMNH, 2♀ BMNH, 1♂ BMB, 5♂, 1♀ MNHN, 2♀ USNM. **GUATEMALA** (46♂, 23♀): *Alta Verapaz*: Cubilguitz 1♂ BMNH; La Vega del Cuajilote 250m Aug. 1♀ AME; Polochic Valley 4♂, 2♀ BMNH; Tamahú 2♂ BMNH; Tucurú Jun. Jul. 4♂ BMNH; *Baja Verapaz*: Panimá 1♂, 1♀ BMNH; San Jerónimo 1♂, 2♀ BMNH; *Chiquimula*: Chiquimula 1♂ MNHN; *El Petén*: El Ceibal Nov. 1♂ AMNH; Sayaxché Sep. Oct. 15♂, 9♀ AMNH; *El Progreso*: Motagua Valley 1♂ BMNH; *Escuintla*: Escuintla Jul. 1♀ USNM; Palín Jul. Aug. 1♂ BMB; *Guatemala*: Amatitlán 3800' Jul.-Sep. 2♀ BMB; *Izabal*: Dartmouth 1♂ BMNH; Izabal 1♂ BMNH; Puerto Barrios 1♀ BMB; *Quezaltenango*: Volcán Santa María Jul. 1♀ USNM; *Retalhuleu*: San Sebastián 1♀ USNM; *Santa Rosa*: Guazacapán 1♂ BMNH, 1♂, 1♀ AME; *Zacapa*: Zacapa Aug. 1♀ USNM; *Not located*: El Chila 2200' Sep. 2♂ BMB; Pacific Coast 2♂ BMNH; no specific locality 4000' Dec. 2♂ BMNH, 2♂ BMB, 2♂ MNHN. **BELIZE** (1♂): *Corozal*: Sarteneja Dec. 1♂ FSCA. **EL SALVADOR** (2♂, 5♀): *La Libertad*: La Libertad 10m Dec. 1♂, 1♀ AME; *San Salvador*: Apopa 2000' Sep. 1♂ BMNH; Ilopango 1200' Sep. Oct. 1♀ BMNH; Santa Tecla 900m Nov. 2♀ AME; *Santa Ana*: Citalá 800m Oct. 1♀ AME. **HONDURAS** (4♂, 3♀): *Colón*: Trujillo Dist. 1♂ AMNH; *Cortés*: San Pedro Sula Jul. 1♀ USNM, 1♀ BMNH; *Francisco Morazán*: Tegucigalpa 1♀ BMNH; *Not located*: Las Minas Jul. 1♂ USNM; no specific locality 1♂ BMNH, 1♂ USNM. **NICARAGUA** (8♂, 7♀): *Boaco*: Comoapa 2000' Jul. 2♂ BMNH; *Chontales*: Chontales 2♀ BMNH; *Managua*: Managua Oct. Nov. 3♂, 1♀ AMNH, 2♀ USNM; Managua, 12 km S., Nov. 1♀ USNM; *Río San Juan*: San Carlos 1♂ AMNH; *Zelaya Sur*: Bluefields Dec. 1♀ AMNH; *Not located*: Rochonil Corozal Jul. 1♂ AMNH; no specific locality 2♂ AMNH, 1♂ BMNH, 1♂ MNHN. **COSTA RICA** (16♂, 9♀): *Alajuela*: San Mateo Dec. 1♂ BMNH; *Cartago*: Juan Viñas 2500' Jan. Sep. Nov. 4♂ BMB, 2♂ USNM; *Guanacaste*: Cañas Jul. 1♂, 1♀ FSCA; Cañas, 5 km N.W., Aug. 1♀ USNM; Cañas, 24 km N.W., 1♂ AMNH; Nosara Sep. 1♂ FSCA; Santa Rosa 100m Aug. Nov. 1♂ KWJH, 1♀ AME; San Antonio Feb. 1♀ AME; *Heredia*: San Antonio de Belén Aug. 1♂ USNM; *Puntarenas*: Palmar Norte Aug. 1♀ USNM; *San José*: Puriscal Nov. 1♀ USNM; Villa Colón 600m Jul. 1♂ USNM; *Not located*: no specific locality Sep. 2♀ BMNH, 2♂ MNHN, 1♀ USNM, 1♂ AMNH. **PANAMA** (11♂, 4♀): *Chiriquí*: Valle de Chiriquí 25-4000' 1♀ BMNH; *Colón*: Piña 1♀ AME; *Panamá*: Farfán Feb. 3♂ AME, 4♂, 2♀† AME; Howard AFB Oct. 1♂ AME; Madden Forest Feb. 1♂ AME; *Not* *located*: Caldena Hydro Plant, Canal Zone Jan. 1♂ USNM; no specific locality 1♂ USNM. **COUNTRY UNKNOWN** (7♂): no specific locality 1♂ AME, 6♂ MNHN.

Additional locality data: **MEXICO**: *Chiapas*: throughout - see de la Maza & de la Maza (1993); *Guerrero*: La Sabana; *Jalisco*: El Tuito; *Oaxaca*: Metates (de la Maza, 1987); *Quintana Roo*: Carrillo Puerto; Chumpón; Chunyaxché; Noh-bek; Tres Reyes; Tulúm (de la Maza & Bezaury, 1992); numerous records in Beutelspacher (1976: as *A. massilia*) and Warren *et al*. (1998: as *A. iphiclus massilides*) may apply to this species or *A. iphiclus iphiclus*. **BELIZE**: *Cayo*; *Orange Walk*; *Toledo* (Meerman, 1999).

Adelpha iphicleola leucates Fruhstorfer, 1915

Figs. **61c,d**; *295*

Adelpha iphicla leucates Fruhstorfer (1915: 523)

TL: Bahia [Brazil]. **Types**: **BMNH**(R): **HT**♀: "Holotype//TYPE//Bahia// Felder Colln.//ephesa Men.//iphicla leucates Fruhst." [examined]

=*Adelpha iphicla daceleia* Fruhstorfer (1915: 523)

TL: Trinidad. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285 // iphicla daceleia Fruhst. // Trinidad // TYPE // Type // Syntype"; **BMNH**(M): **PLT**?♂: "Trinidad//Fruhstorfer Coll. B.M. 1937-285" [both examined]

Adelpha iphicla Linn., Kaye (1904); *Adelpha iphicla phera* Fruhst., Hall (1938) misid.; =*Adelpha iphiclus* Linn., Hayward (1940); *Adelpha iphiclus phera* Fruhst., Neild (1996) misid.; *Adelpha iphicleola leucates* Fruhst., Willmott & Hall (1999)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by having slightly rounder wings, a broader white postdiscal band and a narrower orange DFW subapical marking, which usually consists of a triangle in cell M_3-M_2 that touches vein M_3 at its apex. It is distinguished from *A. i. iphimedia* by that subspecies having an even broader postdiscal band and narrower orange DFW subapical marking, which usually only extends into cell M_3-M_2 at its distal edge, not reaching vein M_3, and is narrower in cell M_1-R_5 than M_2-M_1. It is distinguished from both *A. i. thessalita* and *A. i. gortyna* by the broader postdiscal bands and characters of the pale VFW subapical marking that distinguish this species from *A. iphiclus* (see under species account for *A. iphicleola*). This subspecies is very similar, if not indistinguishable from, *A. iphiclus* in northern Venezuela and Trinidad. It is generally smaller, and I have used the characters discussed under the identification of *A. iphicleola* from *A. iphiclus* in species account of the former, particularly those of the ventral surface, to recognise specimens of *A. iphicleola leucates* from that area, but there are certain specimens that appear to be intermediate. This subspecies is also very similar to *A. iphiclus ephesa*, and the characters that distinguish it are discussed under the latter subspecies.

This subspecies is individually and geographically variable, and more material may reveal phenotypes that merit taxonomic recognition. For the present, given the relatively few specimens that I have examined and the individual variation, I treat all specimens of this species from northern Venezuela to Paraguay as a single taxon. Northern Venezuelan specimens typically have broader white postdiscal bands and a narrower orange DFW subapical marking, some of which approach *A. iphicleola iphimedia* and are marked with a † in the list of specimens examined below. Certain Trinidadian specimens approach these Venezuelan specimens, but the postdiscal band is variable and usually narrower. Certain specimens have an orange DFW subapical marking similar to *A. i. iphiclus*, in addition to a darker VHW and straighter VHW postdiscal and submarginal series, and these may actually represent *A. iphiclus*. For the present, however, I treat them as *A. iphicleola leucates*, since typical *A. iphiclus* also seems to be present on Trinidad; one female specimen in the BMNH collected by M.E. Fountaine is very much like the syntype of *exanima* figured by Neild (1996), considered here a synonym of *A. iphiclus iphiclus*, with a narrow orange DFW subapical marking typically shaped as in *A. i. iphiclus*, relatively broad postdiscal bands, larger size, a dark VHW, and parallel VHW postdiscal and submarginal series. I have seen few specimens from southern eastern Brazil, possibly because they are rare there, present and very similar to *A. iphiclus ephesa*, or simply absent. It is therefore unclear whether specimens from Paraguay represent an isolated population, but they appear to differ little phenotypically from the holotype of *leucates*.

Fruhstorfer (1915) described this subspecies based on a specimen from Bahia in the Tring Museum, and the holotype is now in the BMNH(R) (Fig. 61c,d). I have been unable to locate the specimens he also refers to from Pernambuco in Staudinger's collection, there are neither *A. iphiclus* or *A. iphicleola* in the ZMHU from that locality. He also described *daceleia* on the same page, largely based on its smaller size, from an unspecified number of specimens from Trinidad. Due to the difficulties in assigning Trinidadian specimens to *A. iphiclus* or *A. iphicleola*, I designate the specimen in the BMNH(T) as the lectotype of *Adelpha iphicla daceleia*, with the following label data: "Fruhstorfer Coll. B.M. 1937-285//iphicla daceleia Fruhst.//Trinidad//TYPE//Type// Syntype". This specimen has many of the ventral characters typical of *A. iphicleola*, except for rather straight VHW postdiscal series, and I therefore regard it as representing this species. For the reasons given above I also regard it as a synonym of *A. iphicleola leucates*. Hall (1938) synonymised both *leucates* and *daceleia* with *phera*, another Fruhstorfer taxon, here regarded as synonymous with *A. iphicleola iphimedia*. Neild (1996) also used the name *phera* to refer to Venezuelan specimens treated here as *A. iphicleola leucates*, and referred to *daceleia* as representing a distinct subspecies. I prefer to place *daceleia* as a synonym of *leucates*, rather than *vice versa*, since I am much more sure that the holotype of *leucates* is truly conspecific with *A. iphicleola iphicleola*, given the similar orange DFW subapical marking, shared ventral surface characters and apparent sympatry with typical *A. iphiclus*, whilst there is an element of uncertainty surrounding the identification of all Trinidadian specimens. The name *daceleia* is still available should north Venezuelan and Trinidadian specimens prove to be distinct from typical *leucates*.

Range: Coastal regions from northern Venezuela to eastern Brazil, Paraguay and Trinidad, and possibly southeastern Brazil.

Habitat and adult ecology: This subspecies is common in parts of its range, such as Trinidad, but generally rare in continental South America. It has been recorded up to 1100m throughout the year, at least in Venezuela. Matthew Cock (pers. comm.) reports that it is common and widespread in or near primary or secondary forest in Trinidad, while Barcant (1970) states that males are encountered as solitary individuals in sunny areas, and also puddle at damp sand.

Specimens examined (100♂, 74♀): † - very wide white postdiscal bands, reduced orange DFW subapical marking, very similar to *A. i. iphimedia* but smaller; ‡ - large specimens, narrower postdiscal bands, orange DFW subapical marking shaped as in *A. i. leucates*; * - DFW orange like *A. i. iphimedia*, resembles syntype *phera* – mislabelled?; **?** - identification uncertain, may be *A. iphiclus*.

VENEZUELA (21♂, 25♀): *Aragua*: El Limón 450m Feb. Jul. 1♂ MUSM, 1♂ AME; La Cesiva 700m Nov. 1♂ JFL; Portochuelo Pass 1100m Dec. 1♀ MUSM; Pozo Diablo, Maracay Oct. 1♂ FSCA, 3♂ AME; Rancho Grande Apr. Jun. 1♂, 1♀ USNM; *Bolívar*: Bolívar 1♀‡ BMNH; via El Dorado-Santa Elena km 92 500m Jun. 1♀**?** AFEN; *Carabobo*: Puerto Cabello Jul. 1♀† BMNH; San Esteban Jun.-Sep. 2♀**?** BMNH, 1♂, 1♀ BMB; Valencia Sep. 1♂ BMB; *Distrito Federal*: Caracas 3000' Feb. Sep. Oct. 1♀† BMNH, 1♂ AME, 2♂, 2♀ BMB; Macuto 400' Mar. 1♀† BMNH; *Lara*: Sanare 1♀ MNHN;

Monagas: Barrancas 3♂, 6♀ AME; *Táchira*: Cúcuta 1♀ BMB; *Not located*: no specific locality 2♂, 2♀ AMNH, 1♂, 2♀(1†,1‡) BMNH, 1♂, 1♀ MNHN, 1♂ MCZ. **TRINIDAD** (44♂, 33♀): *Caroni*: Brasso 1♂ AMNH; Tabaquite, Narieva 1♀ BMNH; *St. Andrew*: Curuto Oct.-Dec. 1♀ BMB; Santa Cruz Mar. 1♂ AMNH; *St. George*: Arima Jan. Oct.-Dec. 1♂, 1♀ BMB, 1♀ AMNH; Arima valley Mar. Dec. 3♀ AMNH; Caparo Valley 1♂ BMNH; Chancellor Rd., Port of Spain Feb. 5♂, 2♀ BMNH; Fondes Amandes 1♂ AME; Hololo Mt. rd. Mar. Aug. 3♂, 2♀ AMNH, 1♀ USNM; Maraval Oct.-Dec. 1♂ BMB; St. Anns Sep. Oct. Dec. 2♀ AMNH, 1♂, 1♀ AME, 2♂ BMB; Simla Dec. 2♀ AMNH; *St. Patrick*: La Brea Sep. 2♂ FSCA; Siparia Oct.-Dec. 1♂ BMB; *Victoria*: Mt. Diable Jan. May 2♀ BMNH; *Victoria*: Moruga 1♂ AME; *Not located*: Botanical gardens 2♀ AMNH; Northern Mts. Dec. Jan. 1♂ BMB; no specific locality Apr. May Oct. Dec. 16♂, 5♀ BMNH, 2♂, 2♀ AME, 1♂, 1♀ BMB, 1♂, 2♀ MNHN, 2♀ AMNH, 2♂ MCZ. **GUYANA** (1♀): *Upper Takutu/Upper Essequibo*: Annai, Essequibo 1♀**?** BMNH. **FRENCH GUIANA** (1♀): *Laurent du Maroni*: Maroni River 1♀ AME(may be mislabelled *gortyna* or *iphicleola*). "**PERU**" (5♂): *Not located*: "Peru//Schaus" 5♂ USNM-error. **BRAZIL** (17♂, 5♀): *Bahia*: Bahia 1♂ BMNH; Itabuna Jan. 1♂ AME; *Ceará*: Ceará 2♂ BMNH; *Mato Grosso do Sul*: Corumbá Apr. 4♂ BMNH; Urucum, 15 mi. S. Corumbá Apr. 3♂ BMNH; *Pará*: Pará 1♂**?**, 1♀ BMNH; *Pernambuco*: Pernambuco 2♂, 2♀ BMNH; *Rio de Janeiro*: Rio R. 1♀ BMNH; *Santa Catharina*: no specific locality 1♀ (identical to *A. i. iphicleola* - mislabelled?) BMB; *Not located*: no specific locality 2♂ BMNH, 1♂ MNHN. **PARAGUAY** (11♂, 6♀): *Boquerón*: Estancia Cooper, Alto Paraguay 1♂, 1♀ BMNH; *Central*: Patiño Cué 3♂, 3♀ BMNH; Santísima Trinidad Jun. Aug. 2♂ AMNH; *Guaíra*: Colonia Independencia Sep. 1♂ AME; *Paraguarí*: Sapucay 1♀(W. Foster 10/XI/04) BMNH, 1♂ BMB; *San Pedro*: Río Jejuy 1♂ BMNH; *Not located*: Central 1♂ BMNH; no specific locality 1♀ BMNH, 1♂* USNM. **ARGENTINA** (1♂): *Corrientes*: Ituzaingo Jul. 1♂ AME. **COUNTRY UNKNOWN** (1♂, 3♀): no specific locality 1♂, 1♀ BMNH, 1♀ AME, 1♀ MNHN.

Additional locality data: **ARGENTINA**: *Formosa*: Gran Guardia, 80 km N.W. of Formosa (G. Canals, pers. comm., MLP).

Adelpha iphicleola iphimedia Fruhstorfer, 1915

Figs. **61e,f**; *295*

Adelpha iphicla iphimedia Fruhstorfer (1915: 523)

TL: Cuba. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//iphimedia Fruhst.//Cuba//TYPE//Type//Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//iphimedia Fruhst.//Helguin, Cuba H. Rolle Berlin SW11//TYPE//Type" [both examined]

=*Adelpha iphicla phera* Fruhstorfer (1915: 523)

TL: locality stated as unknown. **Types**: **MHNG**: **ST**♂?: "Méxique//iphicla phera Fruhst." [photograph examined]

Nymphalis basilea Cram., Poey (1847: 48); *Adelpha basilea* Cram., Gundlach (1881); *Adelpha iphicla* Linn., Holland (1916); *Adelpha iphimedia* Fruhst., Brown & Heineman (1972); *Adelpha iphicleola iphimedia* Fruhst., Willmott & Hall (1999)

Identification, taxonomy and variation:

This subspecies is distinguished from all others by the very broad postdiscal bands and narrow orange DFW subapical marking, which scarcely enters into cell M$_3$-M$_2$ and is particularly narrow in cell M$_1$-R$_5$, noticeably more so than in cell M$_2$-M$_1$. In addition, in comparison with northern continental *A. iphicleola leucates*, the hindwing distal margin is slightly more produced at vein Cu$_1$. There is slight variation in the width of the postdiscal bands and orange DFW subapical marking, and some specimens have paler brown ground colour in the region of the upper DFW postdiscal band.

Fruhstorfer (1915) described this subspecies from an unspecified number of specimens from Cuba, mentioning both of the diagnostic characters, and two syntypes are in the BMNH(T) (Fig. 61e,f). A further three males in the BMNH(M) from Fruhstorfer's collection are also probable syntypes. The name *phera* was described by Fruhstorfer on the same page in comparison with his taxon *exanima* (figured by Neild, 1996), supposedly differing in wider postdiscal bands and relatively "small transcellular spots" on the ventral surface. He gave no indication of the number, sex or whereabouts of the type specimen(s), and stated that the locality was unknown. Hall (1938) interpreted *phera* to be what I have treated here as *A. iphicleola leucates*, while Neild (1996) applied the name just to northern Venezuelan *A. iphicleola* (as *A. iphiclus phera*). Both these decisions were entirely logical given Fruhstorfer's almost worthless description, but a specimen discovered by Gerardo Lamas in the MHNG, which appears to be a syntype and bears a label stating "iphicla phera Fruhst." in Fruhstorfer's hand, is clearly not from northern continental South America. Although this specimen is labelled "Méxique", and Fruhstorfer (1915) claimed the locality was unknown, it may be that he made a mistake or the label was subsequently added. The specimen has the very reduced orange DFW subapical markings and wide white postdiscal bands typical of the Cuban subspecies *iphimedia*, but is also very similar to a specimen in the USNM labelled "Paraguay". The latter specimen may be mislabelled, or it may be that specimens from Paraguay have converged on the Cuban phenotype. I regard the name for the present as representing, and therefore being synonymous with, *A. iphicleola iphimedia* (see Willmott & Hall, 1999)

This taxon has generally been treated as a subspecies of *A. iphiclus* or even a distinct species (Brown & Heineman, 1972), but the latter is untenable given the close similarity of certain northern Venezuelan specimens of *A. iphicleola leucates*. I place it as a subspecies of *A. iphicleola* for the same reasons as *leucates*, that it possesses all the characters typical of *A. iphicleola iphicleola* except for the reduced orange DFW subapical marking, which usually does not reach vein M$_3$.

Range: The island of Cuba and the neighbouring Isle of Pines (Riley, 1975).

Habitat and adult ecology: Riley (1975) states that in Cuba this is a forest butterfly encountered typically as solitary individuals, and although it is widespread, it is not common. It occurs in tall, semi-deciduous forest on limestone substrate, or, more rarely, in lower canopy scrub (Hernández *et al*., 1994). Alayo & Hernández (1987) state also that it tends to fly high in the canopy, where it rests occasionally.

Specimens examined (42♂, 61♀):

CUBA (40♂, 57♀): *La Habana*: Havana 2♀ AMNH; La Havane 1♀ BMNH; *Las Villas*: Soledad, Santa Clara 1♀ MCZ; *Matanzas*: Matanzas Apr. Sep. 1♂ BMNH, 2♂ BMB; *Oriente*: Baracoa 2♂ USNM; Guantánamo 1♀ AMNH; Holguín 10♂, 11♀ BMNH; Santiago Jul. Dec. 3♀ USNM, 1♂ AME, 1♀ BMB; Sierra Maestra 1000' 6♀ MCZ; Tánamo Jan. Mar. 1♂, 4♀ USNM, 1♂, 2♀ AMNH, 1♀ BMNH; Torquino Mass 3500' Jul. 3♂, 8♀ MCZ; Torquino River 100' 1♂ MCZ; *Pinar del Río*: N. of Viñales Sep. 1♀ AMNH; Santa Cristóbal 1♀ BMNH; *Not located*: E. Cuba 1♂, 4♀ BMNH; Mocha Apr. 2♂ BMB; no specific locality 7♂, 1♀ BMNH, 2♂, 1♀ MCZ, 3♀ BMB, 2♂ MNHN, 1♂, 2♀ USNM, 3♂, 3♀ AMNH. "**GUYANA**" (1♂): *Cuyuni/Mazaruni*: Kartabo 1♂ AMNH-error?. **COUNTRY UNKNOWN** (1♂, 4♀): no specific locality 1♂, 3♀ BMNH, 1♀ USNM.

Additional locality data: **CUBA**: *Pinar del Río*: Guanahacabibes peninsula Mar. Aug. Oct. (Hernández *et al*., 1994).

Adelpha iphicleola gortyna Fruhstorfer, 1915

Figs. **61g-j**; *295*

Adelpha iphicla gortyna Fruhstorfer (1915: 523)

TL: Bogotá, Colombia. **OTL**: Colombia, Cauca Valley. **Types**: **BMNH**(M): **LT**♂: "TYPE//Bogotá//Paratype//Fruhstorfer Coll. B.M. 1933-131"; **PLT**♂: "Columbien ex coll. H. Fruhstorfer//TYPE//Paratype" = *A. iphiclus*; **BMNH**(T): **PLT**♂: "Fruhstorfer Coll. B.M. 1937-285//iphicla gortyna Fruhst.//Columbien ex Coll. H. Fruhstorfer//Bogotá//TYPE//Type//Syntype" = *A. iphiclus* [all examined]

=*Adelpha iphiclus* Linn., Hayward (1940); *Adelpha iphiclus* Linn., DeVries (1987) misid.; *Adelpha iphiclus* Linn., DeVries (1987: pl. 27, fig. 1) ?; *Adelpha iphicleola* ssp. nov.? Neild (1996: pl. 3, fig. 130); *Adelpha iphicleola gortyna* Fruhst., Willmott & Hall (1999)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by generally lacking the ventral characters that typically separate this species from *A. iphiclus*, and by having a reduced orange DFW subapical marking which usually has a straight basal edge and just touches vein M$_3$, rather than broadly bordering this vein. It is thus very similar to *A. iphiclus iphiclus*, and its identification is discussed under that taxon. *Adelpha* *iphicleola thessalita* is distinguished by having a more extensive orange DFW subapical marking, typically broadly bordering vein M_3, and the white DFW postdiscal band tapers from the anal margin to cell Cu_1-M_3, with a less strongly concave distal edge, instead of being of even width. *Adelpha iphicleola leucates* has a wider white postdiscal band, and ventral characters typical of the nominate subspecies. There is slight individual variation in the width of the orange DFW subapical marking. The single specimen known from northwestern Ecuador differs from typical *A. i. gortyna* in having a narrower postdiscal band which is tinted greenish blue, and a narrower orange DFW subapical marking. Since these characters correspond to the wing pattern of the mimetic group of which this species is part in that area, it is probable that they occur stably in *A. iphicleola* throughout western Ecuador. However, given that I have only examined a single, slightly worn specimen, and the variability in this species, I do not describe it at present.

Fruhstorfer (1915) described this taxon as a subspecies of *A. iphiclus*, based on specimens from "Colombia, very common in the Cauca Valley". He compared it to *A. iphicleola iphicleola*, and said that it had a smaller orange DFW subapical marking and narrower postdiscal bands. I have located three syntypes in the BMNH, two which are typical Colombian *A. iphiclus* and a third which has a more extensive orange DFW subapical marking and white DFW postdiscal band which is broadest in cell Cu_1-M_3, which I regard as *A. iphicleola* (Fig. 61g,h). Since I otherwise regard Colombian *A. iphiclus* as representing the nominate subspecies, and the name *funalis* is available should it prove to be distinct, Willmott & Hall (1999) designated the third of these syntypes as the lectotype of *A. iphicla gortyna* and placed the name as a subspecies of *A. iphicleola*.

Despite the lack of shared ventral characters between this taxon and nominate *A. iphicleola*, the similar shape of the orange DFW subapical marking, and its geographic position, between the nominate subspecies and *A. iphicleola leucates*, which also has ventral characters similar to the nominate, suggests it is conspecific with both of these taxa. Furthermore, certain specimens from Panama appear to be intermediate between this subspecies and the nominate, with the ventral surface as in the former, but the orange DFW subapical marking as in the latter.

Range: Western Colombia to northwestern Ecuador, to northwestern Venezuela in the foothills of both slopes of the Mérida range to northwestern Colombia (Meta province). Very probably also occurring in eastern Panama.

Habitat and adult ecology: This subspecies is rare in collections. In western Ecuador I found a single male attracted to rotting fish in a river side trap at the edge of a road and primary forest, in bright sun, at the end of the wet season. This is the first record for the species from western Ecuador, where it appears to be much rarer than its close relative, *A. iphiclus*.

Specimens examined (30♂, 6♀): † - broader postdiscal bands; **?** – identification uncertain.

VENEZUELA (2♂): *Táchira*: Via Chorro del Indio, San Cristóbal Nov. 1♂ AFEN; Hda. Pánaga 800m Jul. 1♂ AFEN. **COLOMBIA** (27♂, 6♀): *Boyacá*: Muzo 1♂**?** MNHN, 1♂ AME; *Caldas*: Quebrada de Pidrias, Mpio. Anserma Apr. 1♂ ESM, 1♂ MHNUC; *Cauca*: Espejuelo, nr. Cali Mar. Apr. 1♂ BMNH; *Cundinamarca*: Bogotá 1♂ BMNH, 1♀ AMNH; Fusagasugá 1♀ AMNH; Mt. Redondo Dec. 1♀ AME; Tobia Feb. 1♂ KWJH; Villeta 1♂† AMNH; *El César*: Manaure 1♂, 1♀ BMNH; Río Chiquinla, Atánquez, Santa Marta 800m Jul. 1♀ BMNH, 1♂**?** MNHN; *Meta*: Restrepo May 1♂ JFL; "Villavicencio Meta Colombia 1800' July 13 1972, *leg.* R. Robbins//R.K. Robbins collection" 1♀† USNM; "Villavicencio Col. Spring 1924 [collector name illegible]" 1♂ AMNH; *Tolima*: Payande, Río Frío 950m Feb. Mar. 3♂ AME; Río Atá 1000m May 2♂ AME; *Not located*: de Bogotá a Buenaventura Dec.-Feb. 4♂ BMNH; no specific locality 4♂ BMNH, 2♂ AMNH.

ssp. nov.?

ECUADOR (1♂): *Esmeraldas*: Río Piguambí 800m Jul. 1♂ KWJH.

Adelpha iphicleola thessalita Willmott & Hall, 1999

Figs. **61k,l**; 152a,b; *295*

Adelpha iphicleola thessalita Willmott & Hall (1999: 10, fig. 7a,b, 17a,b)

TL: Finca San Carlo, Napo, Ecuador. **Types**: ECUADOR: **KWJH**: **HT**♂: Finca San Carlo Sep. 600m; **PT**♂: same data as HT; **PT**♂: El Capricho Napo 800m Oct.; 3**PT**♂: Las Minas de Misahuallí Napo 400m Jul.; 3**PT**♂: Pimpilala Napo 600m Sep.; **PT**♂, **PT**♀: Yarina Río Manduro nr. Coca 250m Sep.; 2**PT**♂: Puyo-Canelos rd. km 30 600m Oct.; **BMNH**(M): **PT**♂: "Canelos, Ecuador, A. Simson//♂//B.C.A. Lep. Rhop. Adelpha iphicla Linn. Godman-Salvin Coll. 1916.-4."; **BMNH**(R): **PT**♂: "Napo, Río Napo, E. Ecuador July 1927 (Dr. Spillmann)"; **AME**: **PT**♂: Puerto Misahuallí Napo 6 Nov. 1983 D. & J. Jenkins; **MNHN**: 2**PT**♂: Río Napo; **DAT**: **PT**♂: "Talag Ecuador Alt. 800m D.A.Trembath 15.IX.95 No. 14179". PERU: **AME**: **PT**♀: "Moyobamba, Peru, VI. 4. 1944//A. C. Allyn Acc. 1965-5" Jun. [all examined]

Identification, taxonomy and variation:

This subspecies is distinguished from *A. i. gortyna* and *A. i. leucates* under those subspecies, and from *A. iphiclus iphiclus* under that taxon. The extent of the orange DFW subapical marking is slightly variable, sometimes only bordering vein M_3 for a short distance.

Willmott & Hall (1999) described this taxon as a subspecies of *A. iphicleola* on the basis of the similar orange DFW subapical marking and hindwing shape, and apparent intermediate specimens in western Colombia.

Range: To date known only from eastern Ecuador to northeastern Peru, but very probably extending into southeastern Colombia.

Habitat and adult ecology: Although this subspecies is very rare in major museum collections, it is actually not uncommon in the field, in lowland forest habitats up to 850m. Males may be attracted to rotting fish in ridge top light gaps in primary forest, often several specimens to a single trap. They are also found perching in small groups in large clearings near rivers on tops of bushes 3-4m high, in a manner similar to *A. serpa* and *A. thoasa*. I have not observed this perching behaviour in *A. iphiclus*.

Specimens examined (19♂, 2♀):

ECUADOR (19♂, 1♀): *Napo*: El Capricho 800m Oct. 1♂ KWJH; Finca San Carlo 600m Sep. 2♂ KWJH; Las Minas de Misahuallí 400m Jul. 3♂ KWJH; Pimpilala 600m Sep. 3♂ KWJH; Puerto Misahuallí Nov. 1♂ AME; Puerto Napo Oct. 1♂ GWB; Río Napo 2♂ MNHN, 1♂ BMNH; Talag 800m Sep. 1♂ DAT; Yarina, Río Manduro, nr. Coca 250m Sep. 1♂, 1♀ KWJH; *Pastaza*: Canelos 1♂ BMNH; Puyo-Canelos rd., km 30, 600m Oct. 2♂ KWJH. **PERU** (1♀): *San Martín*: Moyobamba Jun. 1♀ AME.

Additional locality data: **ECUADOR**: *Napo*: Apuya Aug. Sep.; Chichicorrumi Jul.; Pimpilala Aug.; Río Shandia Sep.; Tiguino Aug. (Willmott & Hall, sight records).

Adelpha abyla (Hewitson 1850)

Figs. **62a,b**; 153a,b; 236a,b; *295*

Heterochroa abyla Hewitson (1850: 437, pl. IX, fig. 7)

TL: Jamaica. **Types**: **BMNH**(T): **ST**♀: "Jamaica//B.M. TYPE No. Rh. 9852 Heterochroa abyla ♀ Hew.//Type//Syntype"; **BMNH**(M): **ST**♀: "(Jamaica) Hewitson Coll. 79-69 Heterochroa abyla. 3.//Paratype// abyla//B.M. TYPE No. Rh. 9853 Heterochroa abyla ♀ Hew."; **ST**♂: "(Jamaica) Hewitson Coll. 79-69 Heterochroa abyla. 1."; **ST**♀: "(Jamaica) Hewitson Coll. 79-69 Heterochroa abyla. 2." [all examined]

Adelpha abyla Hew., Kirby (1871); *Adelpha iphicla abyla* Hew., Hall (1938); *Adelpha abyla* Hew., Riley (1975)

Identification, taxonomy and variation:

Adelpha abyla is easily distinguished from *A. iphiclus* and *A. iphicleola* by the pronounced hindwing margin at veins Cu_2 and Cu_1, the whitish submarginal line on the DHW, and the broad and dark subapical orange marking on the DFW. There is little variation in the specimens examined.

Hewitson (1850) described the species from an unspecified number of specimens in the British Museum and his own collection, and I have located 1 male and 3 female syntypes in the BMNH (Fig. 62a,b). The figure of the dorsal surface of the right hand pair of wings in the original description and the type locality leave no doubt as to the identity of this taxon.

The lack of sympatry of *A. abyla* and either of its two potential sister species, *A. iphiclus* and *A. iphicleola*, leave its specific status open to question. I have been unable to find any consistent genitalic differences between any of these three taxa, notwithstanding the claims of Schwartz (1989a) that the genitalia of *A. abyla* are indistinguishable from *A. f. lapitha* (and therefore would be very distinct from either *A. iphiclus* or *A. iphicleola*). I conclude that Schwartz's claim must have been based on misplaced specimens, since the genitalia that he describes as belonging to *A. fessonia* clearly belong to *A. iphiclus*, *A. iphicleola* or *A. abyla*. While the majority of authors (Fruhstorfer, 1915; D'Abrera, 1987; Schwartz, 1989a,b; Smith *et al.*, 1994) have regarded *A. abyla* as a good species, Hall (1938) placed it as a subspecies of *A. iphiclus*. I have been tempted to place it as a subspecies of *A. iphicleola*, but I retain it as a good species for three reasons: the modification in shape of the hindwing margin and the shape of the DFW orange subapical marking, which extends over the inner submarginal series, are two very distinctive characters which occur in no other mainland subspecies of either *A. iphiclus* or *A. iphicleola*. These wing shape and pattern differences are greater than occur between either *A. iphiclus* and *A. iphicleola*, and between any of their constituent subspecies. The shape of the DFW orange subapical marking is more similar to *A. iphiclus*, only just extending into cell M_3-M_2, while the hindwing shape and distally displaced white postdiscal spot in cell Cu_1-M_3 on the DFW are more similar to *A. iphicleola*. I am therefore unable to say with certainty whether *A. iphiclus* or *A. iphicleola* is the sister taxon to *A. abyla*. There are also hints of morphological differences in the early stages in the two published descriptions (Swainson, 1901; Smith *et al.*, 1994), discussed below.

It is interesting to note that the dorsal wing pattern of this species more closely resembles that of Central American *A. iphicleola iphicleola* and *A. iphiclus iphiclus* than the Cuban *A. iphicleola iphimedia*, geographically the closest and therefore the most plausible sister taxon if relatively recent dispersal were proposed to explain the distribution of the two taxa. Miller & Miller (1989) regarded the evolution of the Jamaican butterfly fauna to have been heavily influenced by the proximity of the island to Central America during the Eocene, and suggested that the ancestor of the endemic Jamaican swallowtail, *Pterourus homerus* (Fabricius), may have become isolated from the mainland population during this period. The phenotypic similarity of *A. abyla* to the mainland *A. iphiclus* and *A. iphicleola* suggests that it has not been isolated for a substantial period of time, but, if dispersal is invoked for the origin of *A. abyla* in Jamaica, its absence elsewhere in the Greater Antilles is puzzling.

Range: The island of Jamaica.

Immature stages: According to Ellwood & Harvey (1990), there is a watercolour painting of the larva and pupa by Lady Edith Blake, painted between 1889 and 1898, in the collection of the Entomology Library at the BMNH. A handwritten annotation on the painting notes that the adult eclosed in August, nine days after pupation. The depicted hostplant, *Mussaenda treutleri* (Rubiaceae), which shows larval feeding damage, is a cultivated ornamental, native to Asia. Swainson (1901) was the first to provide a description of the larva and pupa of this species, while Smith *et al*. (1994) summarised detailed notes on the early stages by Milner and Turner. The pale brown egg is laid singly beneath the tip of a young leaf on a sapling, and third to fifth instars are brown, greyish brown ventrally, with lateral black stripes, and pale grey dorsally on A1. The head capsule is dark brown with a paler median stripe, and in addition to the usual lateral chalazae it apparently has "numerous smaller, light brown spines". Since the front of the head capsule in *A. iphiclus/iphicleola* is notably smooth, this observation may be of taxonomic interest, or it may be simply referring to the usual, sparse, small setae which surround the chalazae and sides of the head capsule. There are several points of similarity between Milner and Turner's notes and those of Swainson, which suggest that the morphology of the larval scoli and pupa may be rather different in this species compared to *A. iphiclus/iphicleola* (figured by Aiello, 1984). Curiously, both state that scoli begin on the first two thoracic segments, but since no dorsal or subdorsal scoli are known on T1 in any other *Adelpha* species, I assume both incorrectly numbered the segments and regarded T2 as the first segment. Making this assumption, both state that there are pairs of anteriorly curving subdorsal scoli on T2 and T3, with that on T3 the longer, a pair of short scoli on A1, and pairs of larger, posteriorly curving scoli on A2, A8 and A10, the latter two described by Swainson as "branching stellate spines". Both descriptions also mention a series of subspiracular scoli, but any references to other subdorsal scoli are conspicuously absent. Since the subdorsal scoli of *A. iphiclus/iphicleola* are well developed on all abdominal segments from A2-A8, the implicit reduction of scoli on A3-A7 in *A. abyla* is of potential taxonomic significance. Milner and Turner's notes describe the pupa as being brown with reddish coloration and golden dorsal spots, having the dorsal projection on segment A2 curving anteriorly to meet the projection of T2, while Swainson states "the shape is very curious, resembling the pictures of "Punch", long nose and all". Both of these descriptions imply that the projection on A2 is much more produced anteriorly in *A. abyla* than in *A. iphiclus/iphicleola* (see Aiello, 1984), while Milner and Turner state that the head horns are short, pointed projections, as in *A. iphiclus/iphicleola*.

Habitat and adult ecology: Riley (1975) reports that this species is uncommon but widespread in foothills and mountains in open, sunny forest glades, from 100m to around 900m. Brown & Heineman (1972) quote Walker saying that the species, presumably males from the description of the behaviour, usually perches 4.5-6m above the ground, confirmed by Smith *et al*. (1994), who state that favoured perches are the tips of twigs where individuals typically rest with the wings open.

Specimens examined: 61 (33♂, 28♀)

JAMAICA (33♂, 27♀): *Manchester*: Coleyville 1♀ AMNH; *Portland*: Moore Town 3♂, 3♀ BMNH, 1♂ BMB; *St. Andrew*: Halfway Tree Jul. 1♀ AMNH; Jacks Hill 1♂ AMNH; Stony Hill Oct. Nov. 2♂ BMNH, 1♂, 1♀ BMB; *St. Catherine*: Holly Mount Aug. 1♂ AME; Orangefield Feb. 1♂ AMNH; *St. James*: Montego Bay 1♂ AMNH; *St. Thomas*: Bath [400'] Jul. 1♂ AMNH; Cuna Cuna Jul. 1♀ USNM; St. Thomas Jan. 1♀ AMNH; *Trelawny*: Jackson Town? Jul. 1♀ AME; Río Bueno Feb. 1♂ AMNH; *St. Mary*: Oracabessa Oct. 1♂ AME; *Not located*: Baron Hill 1200' Jun.-Aug. 3♂, 3♀ AME, 1♂ BMB; Blue Mts. 1200' Jul. 1♂ BMNH; Crownland Jan. 1♂, 1♀ AMNH; from a box of Jamaican things 1♂ MCZ; Manchester Jan. Feb. 2♂, 1♀ MUSM; Mt. Diablo Apr. Aug. 1♂, 1♀ AMNH, 1♂, 1♀ AME; Rochmore Mar. 1♂ AMNH; Wilson Run Feb. 1♀ AMNH; no specific locality 5♂, 6♀ BMNH, 1♂ AMNH, 1♀ ZMHU, 1♂, 1♀ BMB, 2♀ USNM. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ BMNH.

Additional locality data: **JAMAICA**: *Manchester*: Christiana; Hermitage; *Portland*: Ecclesdown; Corn Puss Gap; *St. Andrew*: Kingston; Long Mountain; Rock Hall; *St. Catherine*: Spring; *St. Elizabeth*: Accompong; *St. Mary*: Islington; *Trelawny*: Cave River; Warsop; *Not located*: John Crow Hill, Rockmore, Pantrepant, Pollyground, (Brown & Heineman, 1972).

Adelpha melona (Hewitson, 1847)

Figs. 6b,g,m,8a,9,13; **63**; 154; 237; *296*

Identification, taxonomy and variation:

This species is recognised by the broad orange postdiscal band on the DFW and lack of any subapical spots representing the postdiscal series, by the orange filling the area in the VHW discal cell between the second and third cell bars and continuing as a band to the vein $Sc+R_1$, and, in most subspecies, by having orange along the anal margin just basal of the DHW tornus. A unique character visible in all subspecies, except some specimens of the nominate and *A. m. pseudarete*, is a curving, thin red-brown line distal of the pale postdiscal band in the VFW subapical area. This red-brown line seems to be composed of the inner submarginal series in cell M_3-M_2, the space between the outer postdiscal and inner submarginal series in cell M_2-M_1, and possibly the outer postdiscal series in cell M_1-R_5. The male genitalia are unique within the genus in having the dorsal tip of the gnathos extended to form a long anterior arm. There is variation in the presence or absence of a white DHW postdiscal band, the amount of orange or white in the DFW postdiscal band and the extent to which this band is constricted at vein M_3, and the expression of the postdiscal and submarginal series on the ventral surface, and five subspecies are recognised.

Adelpha melona, as treated here, embraces three taxa typically considered as distinct species, the nominate subspecies, *A. melona leucocoma* and *A. melona deborah*. All, however, share the diagnostic characters discussed above, particularly the unique male genitalia.

The wing pattern of *A. melona* is highly modified and its relationships within the genus are difficult to ascertain. However, several characters point to it being most closely related to *A. ethelda* and *A. epione*. The valvae of the male genitalia, which have dorsally pointing spines near the posterior tip and a relatively long clunicula, are similar to those of both these species. All three of these species also share, on the VFW, the fusion of the postdiscal series and the postdiscal band and the loss of the submarginal series in cell Cu_1-M_3, the entire loss or reduction of the submarginal series in cells M_2-M_1 and M_1-R_5, the second and fourth discal cell bars converging to touch posteriorly, and on the VHW, the replacement in at least some subspecies of the inner and outer postdiscal series with a red-brown line, the merging in the discal cell of the of the first and second cell bars, and the third and postcellular bar, and orange scaling filling the area between the second and third discal cell bars forming a band extending to vein $Sc+R_1$. This consensus of characters suggests the placement adopted here, although the relationship of *A. melona*, *A. ethelda* and *A. epione* with respect to members of the *A. iphiclus* group, and other *Adelpha*, is not clear.

Range and status: Central Panama to northwestern Ecuador and northwestern Venezuela, to Bolivia, Brazil, Paraguay, northeastern Argentina, the Guianas and Trinidad. Not uncommon to very rare, in lowland forest from sea level to 1200m.

Specimens examined: 273 (184♂, 89♀)

Adelpha melona melona (Hewitson, 1847)

Figs. **63a,b**; *296*

Heterochroa melona Hewitson (1847: 258, pl. XX, fig. 2)

TL: "Colombia"-erroneous. **Types**: **BMNH**(M): **ST**♂: "Holotype ♂ Heterochroa melona Hewitson 1847 G. Lamas det. '99//BM(NH) Rhopalocera vial number 4413//32, 19, 140, 7//1869a" [examined]; **BMNH**(T): false ST♀: "Heterochroa melona Hewitson ♀ Syntype det. R.I. Vane-Wright 1983//Illustrated in The Butterflies of Venezuela A. Neild, 1996//162//B.M. TYPE No. Rh. 9843 Heterochroa melona ♀ Hew.//melona Hew.//Pará//Type//Syntype" = *melona leucocoma* [examined]

=*Heterochroa arete* Ménétriès (1857: 118) **syn. nov.**

TL: Bahia [Brazil]. **Types**: **ZISP**?: **ST**: [not examined]

=*Adelpha arete cibyra* Fruhstorfer (1915: 529) **stat. nov.**

TL: locality stated to be unknown. **Types**: **MHNG**: **HT**♀: [not examined]

Adelpha melona Hew., Kirby (1871) = *A. melona leucocoma*; *Adelpha arete* Mén., Kirby (1871)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. m. pseudarete* by having the DFW postdiscal band orange to the anal margin. Males are distinguished from *A. m. leucocoma* by the reduction of the ventral postdiscal and submarginal series and the loss or reduction of the pale postdiscal spot in cell Cu_1-M_3 distal of the postdiscal band, in addition to several characters discussed below. Females of this subspecies have a broad white submarginal series on the VHW, but still lack the whitish submarginal series in the VFW tornus and the reddish brown postdiscal line in cells Cu_2-Cu_1 and M_3-M_2, in addition to having reduced postdiscal series on the VHW.

Hewitson (1847) described this species based on an unspecified number of specimens which he stated were in the British Museum, from Colombia, and figured the dorsal surface of the left hand wing pair on plate 20, fig. 2. In the BMNH(T) there is a putative female syntype, labelled as from Pará (Brazil), and all subsequent authors have regarded the name as applying to the Amazonian subspecies of *A. melona*. However, a careful reading of Hewitson's description, coupled with an examination of his original black and white figure, leads me to believe that this is incorrect for a number of reasons. Hewitson's descriptions of other species in the same paper (Hewitson, 1847) are typically very detailed and accurate, as are the figures, which generally correspond very closely with syntype specimens in the BMNH. The illustrated specimen is clearly a male (the putative syntype is female) from the shape of the hindwing, which is much more triangular, has a narrow, elongate tornus and a relatively straight distal margin, and has a narrower and more evenly edged DFW orange band, which has a smoothly curved distal edge in cells M_3-R_5, is only slightly indented at the basal edge at vein M_3, and has no white at the anal margin. The only labelled Colombian specimen of *A. melona* in the BMNH is from Florida, on the Río Putumayo, and would not have been in the collection at the time of the description. Since *A. melona* is otherwise very rare in Colombia, it seems highly unlikely that Hewitson's specimen originated there, and much more plausible that it was either mislabelled, or Hewitson gave an erroneous locality. In fact, the shape and colour of the DFW band and the shape of the DHW band in Hewitson's figure correspond exactly to specimens from southeastern Brazil, the *arete* of authors. Hewitson's description of the ventral surface also fits much more closely the southeast Brazilian taxon, in the following respects: 1. The underside is described as "vinous brown", a perfect description, while Amazonian specimens have only a dark brown ground colour which is largely obscured by paler markings; 2. the postdiscal band on the VFW is said to have the "widest portion ...

clouded with brown", and this fits the VFW postdiscal band which widens continuously from anal margin to costa and has brown shading in cells M_3-M_2 and M_2-M_1, whereas in Amazonian specimens the band is of varying widths throughout and less noticeably obscured by brown scaling; 3. there are said to be four to five white dots in the VFW apex, and three narrow, white lunules in the VHW tornus, as in southeast Brazilian specimens, but there is no mention of the orange-brown submarginal line on the VFW or the prominent white submarginal markings in the tornus, or the broad white submarginal series and the two orange-brown postdiscal lines on the VHW, such as occurs in Amazonian specimens; 4. the discal cell of the VFW is said to have a "lilac" spot, corresponding to the area between cell bars two and four, whereas this area is pure white in Amazonian specimens. The only part of the description that does not fit typical specimens of the southeastern Brazil taxon is the mention of three blue spots distal of the VFW discocellulars; these are typically present in Amazonian *melona*, but usually absent or reduced in southeast Brazilian *melona*, though they are present in a single specimen in the BMNH. In conclusion, the weight of evidence points to Hewitson's specimen having come from southeast Brazil. In the BMNH(M) there are four male specimens of the latter taxon which lack locality data, though Gerardo Lamas has recently identified a specimen which appears to be that on which Hewitson's illustration was based. This specimen closely resembles the original illustration in both wing pattern, including having two whitish spots distal of the VFW discocellulars, and the manner in which the wings are set, and Lamas (*in lit.*) states that it "has 2 round labels, one with the numbers "39, 19, 140, 7" running clockwise, the other saying "1869a". The first label means that it was accessioned in 1839, the accession bearing number 7.19, and the specimen (140) belongs to "Vanessa", was from "Sta. Fe de Bogota", and was "bought from M. Parzudacki" (this information is from the Accessions Book at the Entomological Library)." This information fits perfectly with the date of description of the taxon and the type locality.

Notwithstanding the above discussion, the situation is further complicated by Hewitson (1867a: pl. 26, fig. 2) again figuring *melona*, but this time the ventral surface, and this is clearly a specimen of the Amazonian population. He figured a specimen of the southeast Brazilian population under the name *arete* beside it, and stated that *melona* was distinguished by having the orange band "more sinuated on its inner border, more so usually than is represented in my former figure" (Hewitson, 1867a: 47). Probably Hewitson could not recall the exact nature of the taxon he had described 20 years previously from specimens that were not in his collection, especially since he had only figured the dorsal surface and incorrectly believed the specimen to be from Colombia. When he received specimens of the true Amazonian population subsequent to his original description (Kirby, 1879), he must have assumed that his name applied to them, one of which he figured for comparison with *arete*.

Ménétriès (1857) described *Heterochroa arete* based on an unspecified number of specimens from Bahia, and although I have not seen any syntype specimens, which should be in the ZISP, the description is sufficiently detailed to recognise the taxon described. Ménétriès mentions the orange DFW band being somewhat as in *Adelpha nea nea*, the ventral surface being of a violaceous colour, accurately described the postdiscal band and more basal white band, states that the VFW cell pattern is as in *A. melona*, and makes no mention of ventral white submarginal markings. He distinguished it from *A. melona* by lacking the blue spots distal to the VFW discocellulars, which I regard as individual variation, and lacking the white "lunules" in the VHW tornus, although he appears to have just misunderstood Hewitson's use of the word. Fruhstorfer (1920: pl. 110Ab) correctly figured typical *arete* as having almost no white in the DFW postdiscal band, since Ménétriès stated that the white band "sur les supérieures se perd immédiatement en se fondant dans le bande fauve". The three male specimens that I have examined of this subspecies from Bahia are identical on the dorsal surface to Hewitson's figure of *melona*, and so I place *arete* as a synonym of *melona* (**syn. nov.**). Fruhstorfer (1915) described a subspecies of *arete*, *cibyra*, based on a single female in the Geneva museum, which lacked any trace of white on the DFW. Since, however, this description corresponds exactly to *arete*, Hall (1938) placed it as a synonym of that name, and I further place it as a synonym of *melona* (**stat. nov.**).

Range: I have examined specimens of this subspecies from only three localities, Bahia, Itaparica and Rio, with all remaining specimens lacking any precise data. The latter in particular is a general locality for specimens from all over southeastern Brazil. It is therefore difficult to say what the true range of this phenotype is, and whether or not it is sympatric with *A. m. pseudarete*.

Habitat and adult ecology: This subspecies appears to be very rare and no field observations have been published.

Specimens examined (13♂, 5♀): † - trans. to *A. m. pseudarete*.
BRAZIL (7♂, 4♀): *Bahia*: Bahia 3♂ BMNH; Itaparica Dec. 1♀ BMNH; *Rio de Janeiro*: Rio 2♂, 3♀(1†) BMNH; *Not located*: no specific locality 2♂ BMB. **COUNTRY UNKNOWN** (6♂, 1♀): no specific locality 4♂, 1♀ BMNH, 1♂ USNM, 1♂ MNHN.

Adelpha melona pseudarete Fruhstorfer, 1915 **stat. nov.**

Figs. **63c,d**; *296*

Adelpha arete pseudarete Fruhstorfer (1915: 529)

TL: locality stated to be unknown. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//arete pseudarete Fruhst.//Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha arete* Mén., Hall (1938) form

Identification, taxonomy and variation:

This subspecies differs from the nominate in having the postdiscal band on the DFW white in cell 2A-Cu_2, and often in cell Cu_2-Cu_1. In the case of the latter, the orange in cell Cu_2-Cu_1 may extend, gradually tapering, almost to the anal margin, otherwise it terminates at vein Cu_2. Specimens from further west, especially Paraguay, usually have the orange terminating at vein Cu_2.

Fruhstorfer (1915) described this subspecies as differing from *arete* in having the white on the DFW extend to vein Cu_1, and this closely matches the single Fruhstorfer specimen in the BMNH, which is a syntype. Hall (1938) regarded this as representing no more than a form of *A. m. melona*, and there is much evidence that this is the case. I have seen one female from Bahia which is intermediate to *A. m. melona*, and another male, from Morro do Chapéu, which is more typical *A. m. pseudarete*. The ranges of both phenotypes, as currently known, seem to widely overlap, clearly inconsistent with the subspecies concept. I retain *pseudarete* as a distinct subspecies (**stat. nov.**) since I have examined so few specimens in collections with accurate data that is impossible to say whether or not it is sympatric with *A. melona melona*. It is also probable that the two phenotypes are maintained through mimicry, and it is therefore of potential interest that *A. melona melona* differs from the typical southeast Brazilian mimicry complex, perhaps indicating that it does not occur with typical members. Finally, since the few specimens I have examined from further west, such as São Paulo and Paraguay, seem to be phenotypically relatively stable, it seems possible that the two forms really do represent valid subspecies. I hope that by retaining them here it will provide more information and provoke workers in the field to seek to determine accurately their ranges and so test the validity of this taxonomic arrangement.

Range: The range of this subspecies is difficult to determine, but it has been reported from inland areas in Bahia throughout the Atlantic coastal area to São Paulo, in Minas Gerais, and across to Paraguay and northeastern Argentina. More information is needed on its distribution with respect to *A. melona melona*.

Habitat and adult ecology: Nothing has been reported on the biology of this rare subspecies, which has been captured up to 1200m.

Specimens examined (14♂, 6♀): † - trans. to *A. m. melona*.
BRAZIL (12♂, 4♀): *Bahia*: Bahia 1♀† BMNH; Morro do Chapéu 1200m Apr. 1♂ USNM; *Espírito Santo*: Linhares Aug. 2♂, 1♀ AME; no specific locality 2♂ BMNH, 1♂ MCZ; *Minas Gerais*: Leopoldina 1♂ ZMHU; "*Pará*": Etat de Pará 1♂ BMNH-error; *Rio de Janeiro*: Rio Janeiro 1♀ MNHN; *São Paulo*: Borhumi 1♀ BMNH; São Paulo 1♂ BMNH; *Not located*: no specific locality 1♂ BMNH, 1♂ ZMHU, 1♂ MNHN. **PARAGUAY** (1♂, 2♀): *Paraguarí*: Sapucay 1♀ BMNH; *Not located*: Central Paraguay 1♂ BMNH; no specific locality 1♀ BMNH. **COUNTRY UNKNOWN** (2♂, 2♀): no specific locality 2♂, 2♀ BMNH.
Additional locality data: **ARGENTINA**: *Misiones* (Hayward, 1951).

Adelpha melona leucocoma Fruhstorfer, 1915 **stat. rest**.

Figs. 6b,g,m,8a,9,13; **63e,f**; 154a,b; 237a-c; *296*

Adelpha melona leucocoma Fruhstorfer (1915: 529)

TL: Upper Amazon. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//melona leucocoma Fruhst.//Fruhstorfer//TYPE//Type//Syntype//Published as leucocoma Fruhst. (S.T.)"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//leucocoma Fruhst.//Amaz. S. Fruhstorfer//TYPE//Type"; **BMNH**(M): **ST**♂: "TYPE//Peru H. Fruhstorfer//no indication of what this is a type of?//apparently a paratype of leucocoma (G.T.)" [all examined]

=*Adelpha melona meridionalis* Fruhstorfer (1915: 529) **syn. nov.**

TL: Santa Catharina [Brazil]. **Types**: **BMNH**(R): **HT**♀: "melona meridionalis Fruhst.//Santa Catharina//TYPE//Syntype" [examined]

=*Adelpha biedermanni* Fruhstorfer (1915: 530) **syn. nov.**

TL: not stated. **Types**: **BMNH**(M): **ST**♂: "Joicey Bequest Brit. Mus. 1934-120//Syntype//61. 28//biedermanni ♂ Fruhst. Amazonas" [examined]

=*Adelpha melona nonsecta* Kaye (1925: 413) **syn. nov.**

TL: Trinidad. **Types**: **AME**: **ST**♀: "Type H.T.//Trinidad R. Dick//Adelpha melona Hew. 1847 nonsecta Kaye 1925"; **ST**?♀: "Trinidad, 1898, May, N.J. Kaye//Adelpha melona Hew." [both examined]

Adelpha melona Hew., Kirby (1871), D'Abrera (1987); *Adelpha melona melona* Hew., Fruhstorfer (1915), Hall (1933) misid.; *Adelpha melona thesprotia* Fldr., Fruhstorfer (1915) misid.; *Limenitis melona meridionalis* Fruhst., Brown & Mielke (1967)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate and *A. melona neildi* under those taxa. It differs from *A. m. pseudarete* by the same ventral characters which distinguish it from the nominate. This subspecies is very similar on the dorsal surface to *A. nea*, but easily distinguished by the VFW discal cell pattern, which has the white area between the second and fourth cell bars divided into three by a black line in *A. nea*. There is variation in this subspecies in the width of the orange DFW postdiscal band, the extent to which it is constricted at vein M_3, in some specimens being almost completely broken, the amount of white in the postdiscal band at the anal margin, and whether or not the pale spot distal to the postdiscal band in cell Cu_2-Cu_1 on the VFW is isolated from the band or not.

This taxon has historically been regarded as the nominate subspecies, but for the reasons outlined above under *A. melona melona*, this is not the case. Fruhstorfer (1915) described *A. melona leucocoma*, and later figured it (Fruhstorfer, 1920; pl. 110Aa, missp. as *leucosoma*), based on specimens from the Upper Amazon, which had white at the DFW anal margin, broader white DHW postdiscal bands and a paler ventral surface (Fig. 6e,f). The figure shows a probably slightly melanic specimen with the orange DFW band completely broken. Hall (1933) was right to regard there as being no distinct populations of *A. melona* within the Amazon, but since his synonymy of *leucocoma* with *melona* was based on misidentification of *melona*, I reinstate *leucocoma* as a subspecies of *melona* (**stat. rest.**). Fruhstorfer (1915) described a second subspecies a few lines later, as *A. melona meridionalis*, and later figured it (Fruhstorfer, 1920: pl. 110Aa), based on a single female labelled "Santa Catharina" in the Tring Museum. The holotype is in the BMNH(R) and does not differ from typical females of this subspecies, and the locality, as Fruhstorfer suspected, is clearly erroneous. Given the latter fact, I prefer to use the name *leucocoma* to refer to the Amazonian and Guianan subspecies of *A. melona*, and so synonymise *meridionalis* with *leucocoma* (**syn. nov.**).

Without giving any indication of the number or sex of specimens, where they were collected or in which collection they were deposited, Fruhstorfer (1915) described a species, *A. biedermanni*, which closely matches a single specimen in the BMNH labelled with Fruhstorfer's handwritten label "biedermanni ♂ Fruhst. Amazonas". This specimen was figured by D'Abrera (1987), and it is clearly a melanic aberration, and therefore a synonym of, *A. melona leucocoma* (**syn. nov.**). Notable characters that identify it as *A. melona* include very close discal cell bars on the VHW with orange filling the space between cell bars three and four, the shape and placement of the VFW discal cell bars, with a broad, gradually tapering area between cell bars two and four, and the orange shading at the DHW anal margin near the tornus.

Kaye (1925) described *A. melona nonsecta* based on an unspecified number of Trinidadian specimens, which are now in the AME, on the basis that the DFW orange band was less constricted at vein M_3. However, this is a variable character which also typically occurs in lower Amazonian specimens, and I therefore regard it as not sufficiently distinct or consistent to warrant subspecific recognition, and synonymise *nonsecta* with *leucocoma* (**syn. nov.**).

This subspecies has typically been considered to represent a distinct species from the nominate, but I treat them as conspecific since females of the nominate show several of the ventral characters of this subspecies, and the genitalia are identical.

Range: East of the Andes from Venezuela to Bolivia, throughout Amazonian Brazil as far southeast as the Brazilian plateau, and in the Guianas and Trinidad.

Immature stages: Moss (1933) reared this species in Brazil (Pará), and figured both the last instar larva (pl. I, fig. 6, 7) and the pupa (pl. II, fig. 7). Early instars are typical of the genus in appearance and habits, and later become greenish with very dense scoli, very closely resembling a fragment of moss. The scoli are relatively long with lateral spines on all segments except A1, though they are longest on T2 (Fig. 6b), T3 (Fig. 6g), A2, A7 and A8 (see also Fig. 6m). The head capsule is equipped with short, thick chalazae, of which the anterior series is noticeably pronounced (Fig. 9). The pupa is dull maroon and very distinctive in the dorsal projection on segment T2 terminating in a sharp, triangular point, being extended to touch the projection from segment A2, which is more typical in size (Fig. 13). The head horns are leaf-shaped, elongated at the tip and sharply curved posteriorly. The larval foodplant is a creeper on tree trunks, and the larvae feed within 2m of the ground.

Habitat and adult ecology: This subspecies is not uncommon in relatively intact lowland rain forest habitats up to 1200m, where it flies throughout the year. I have frequently found males in light gaps caused by logging in primary forest, almost always attracted to rotting fish in traps, though they may also be found feeding on sap from freshly cut trees, and on rotting banana. Females are rarer, and are generally encountered in the afternoon in large light gaps with secondary growth. I have never observed males perching, suggesting that they may typically perch in the canopy.

Specimens examined (129♂, 74♀):

VENEZUELA (3♂, 2♀): *Amazonas*: Gavilán, 35 km S.E. Puerto Ayacucho 100m Mar. 2♂ AFEN; *Bolivár*: El Dorado-Santa Elena, km 107, 520m Aug. 1♀ MUSM; San Ignacio de Yuruani Jun. 950m 1♂ AFEN; *Not located*: no specific locality 1♀ BMNH. **COLOMBIA** (4♂): *Amazonas*: Florida 1♂ BMNH; Leticia Oct. 1♂ LMC; Puerto Nariño Dec. 1♂ LMC; *Not located*: no specific locality 1♂ BMB. **ECUADOR** (12♂, 2♀): *Napo*: Apuya 600m Aug. 1♂ KWJH; Chichicorrumi 450m Sep. 1♂ KWJH; Finca San Carlo 600m Feb. Oct. 2♂ DAT, 1♀ KWJH; Pimpilala 600m Feb. 1♂ KWJH; Río Napo 1♂ BMNH; Santa Rosa Apr. 1♀ MJP; Sinde Oct. 1♂ MJP; *Pastaza*: Puyo 2♂ JFL; 32 km S. of Puyo 1000m 1♂ GWB; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Nov. 1♀ PJD; Limoncocha Feb. 1♂ USNM; *Not located*: no specific locality 1♂ USNM. **PERU** (45♂, 6♀): *Cuzco*: Cosñipata Valley 1♂ BMNH; *Huánuco*: Cord. del Sira 800m Aug. Sep. 1♂ MUSM; *Junín*: Satipo 2♂ AMNH; *Loreto*: Balsapuerto 220m May 1♂ MUSM; Cocha Shinguito, Río Samiria 130m Jun. 1♂ MUSM; Río Sucusari 140m Sep. 1♂ MUSM; Iquitos Mar. Apr. 2♂, 1♀ BMNH, 1♂, 1♀ ZMHU, 2♂, 1♀ AME, 1♂ USNM, 1♂ AMNH; Iquitos-Nauta, km 15, 120m Sep. 2♂ MUSM; Naranjal, km 82 Tarapoto-Yurimaguas 1♂, 1♀ MUSM; Pebas Nov. 2♂ BMNH, 1♂ ZMHU; Quebrada Shihua, Río Momón 120m Sep. 1♂ MUSM; San Roque 1♂ AME; Yurimaguas 1♂ ZMHU, 1♂ BMB; *Madre de Dios*: Boca Río La Torre 300m Oct. 1♂ MUSM; *Puno*: Chaquimayo 2500-3500' Aug.-Oct. 1♂ BMNH; Yahuarmayo 1200' Feb. Mar. 1♂ BMNH; *San Martín*: Achinamiza Dec. 1♂ AMNH; Jepelacio 7♂, 1♀ AMNH; Río Negro, nr. Rioja Sep. 1♂ MUSM; *Not located*: Río Huallaga 1♂ USNM, 4♂ AMNH; Río Ucayali 1♂ BMNH; no specific locality 2♂ BMNH, 1♂ USNM, 1♀ BMB. **BOLIVIA** (8♂): *Cochabamba*: Cristal, Chaparé May 600m 1♂ MUSM; *La Paz*: Caranavi 1200m Feb. 1♂ MUSM; La Paz 1000m 1♂ BMNH; Río Songo 2♂ ZMHU; *Santa Cruz*: Prov. del Sara 1♂ BMNH; Río Juntas 300m 1♂ ZMHU; *Not located*: no specific locality 1♂ MCZ. **BRAZIL** (29♂, 32♀): *Amazonas*: Manaus Jan.-Mar. 3♂ BMB; Manicoré 1♂ ZMHU; São Paulo de Olivença 1♂ BMNH; *Maranhão*: "Maranham" 1♀ BMNH; *Pará*: Itaituba, 15 km S., 1♂ USNM; Óbidos Apr. 1♂, 1♀ BMNH, 1♂ BMB; Pará 16♂, 25♀ BMNH, 1♂ MNHN; Santarém Oct. 1♂, 1♀ BMNH, 1♀ ZMHU, 1♂ AME; "*Santa Catharina*": Santa Catharina 1♀ BMNH-error; *Not located*: S. Brazil 1♀ BMB; no specific locality 2♂ ZMHU, 1♀ BMB. **GUYANA** (1♂, 7♀): *Cuyuni/Mazaruni*: Bartica Dec. 1♂ BMNH, 1♀ BMB; Carimang R. 1♀ BMNH; *Potaro/Siparuni*: Potaro River Oct. Nov. 1♀ AME; *Not located*: no specific locality 4♀ BMNH. **FRENCH GUIANA** (8♂, 11♀): *Cayenne*: Camp St. Elie, pk. 15-5 on D21 Nov. 1♀ USNM; Cayenne 1♂ BMNH, 1♂ ZMHU, 1♂, 2♀ USNM; Matoury Dec. 1♀ MUSM; *Laurent du Maroni*: La Mana 1♂ MNHN; Maroni River 2♀ AME; St. Jean du Maroni 1♂, 1♀ BMNH; *Not located*: Rochambeau Mar. 1♂ FSCA; no specific locality 2♂, 2♀ BMNH, 1♀ USNM, 1♀ BMB. **SURINAM** (6♂, 3♀): no specific locality 6♂, 3♀ BMNH. **TRINIDAD** (3♂, 3♀): *St. George*: Hololo Jan. 1♂ AME; St. Anns Oct.-Dec. 2♀ BMB; *Not located*: Northern Mts. Dec. Jan. 1♂ BMB; no specific locality 1000' Feb. 1♂, 1♀ AME. **COUNTRY UNKNOWN** (11♂, 7♀): Amazonas 1♂ BMNH; Amazon 3♀ BMNH, 2♂ USNM, 2♂ BMB, 1♂ MCZ; Amaz. S. 1♂ BMNH; lower Amazon 1♂ MCZ; Tarinas 2♀ BMNH; U. Amazon 1♂ BMB; no specific locality 1♀ BMNH, 1♀ ZMHU, 1♂ USNM, 1♂ BMB.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Santiago Sep.; *Napo*: Apuya Oct. Dec.; Chichicorrumi Feb.; nr. Coca 300m Aug.; El Capricho Oct.; Finca San Carlo Aug. Sep. Dec.; Pimpilala Aug.; Río Tiputini Jun.; Satzayacu Sep.; Yasuní Jul.; *Sucumbíos*: Pañacocha Oct. (Willmott & Hall, sight records). **BRAZIL**: *Goiás*: Campinas Jan. (Brown & Mielke, 1967). **TRINIDAD**: *St. George*: Morne Catherine Mar.; *Not located*: Las Lappas Trace 2000' Sep. (M. Cock, pers. comm.).

Adelpha melona neildi Willmott, **ssp. nov.**

Figs. **63g,h**; *296*

Description and diagnosis: FW length of HT: 30 mm. This subspecies is distinguished from *A. melona leucocoma* by having a broader orange DFW postdiscal band which is typically less indented at vein M_3 at the basal edge, by typically having a narrower white DHW postdiscal band, increased orange scaling separating the pale postdiscal spot in cell Cu_2-Cu_1 on the VFW from the postdiscal band, and by having the inner postdiscal series on the VHW marked as a red-brown line, instead of silvery grey. All of these characters are variable to some extent. It is distinguished from *A. melona deborah* in having a white DHW postdiscal band.

Types: ***Holotype*** ♂: PANAMA: *Colón*: Colón (Sta. Rita), 1500', 12 Jan. 1972 (S.S. Nicolay); in the USNM. ***Allotype*** ♀: *Panamá*: Distrito de Panamá, Cerro Jefe, 900m, 15-17-III-78 (Gordon B. Small); in the USNM. ***Paratypes***: PANAMA (4♂, 3♀): *Colón*: **1**♀: nr. Colón, 1000', March 1969, G.B. Small; in the USNM; **2**♂: Parque Nacional Soberanía, Camino del Oleducto 200m 1 Aug. 1998, A. Orellana; in the AO; *Panamá*: **1**♂: Summit, Panamá, C.Z. V-2-64; in the USNM; **1**♂: Summit, Panamá, C.Z. III-22-64; in the USNM; **1**♀: same data as AT; in the USNM; **1**♀: same data as AT except IV-20-78; in the USNM.

Etymology: I name this subspecies for my good friend Andrew Neild, who has willingly provided an enormous amount of help in photographing specimens and recording data from Venezuelan collections, been always eager to enter into long discussions on taxonomic problems, and whose work on *Adelpha* represents the most careful and insightful taxonomic work on the genus to date (Neild, 1996).

Taxonomy and variation: This subspecies is somewhat variable in the width of the white DHW postdiscal band, which may be almost obsolete, and the extent to which the basal edge of the orange DFW band is incised at vein M_3. It is superficially very similar to *A. m. leucocoma*, but the shape of the orange DFW band and the generally darker ventral surface, in addition to its closer geographic proximity to *A. m. deborah*, which isolates it from *A. m. leucocoma*, show it to be most closely related to *A. m. deborah*. The variation in the white DHW postdiscal band may well indicate some intergradation to *A. m. deborah*, which perhaps occurs in the Darién.

Range: All the specimens of this subspecies that have been collected to date are from central Panama, and it presumably occurs further west, possibly into Costa Rica, though it was not reported by DeVries (1987).

Habitat and adult ecology: This subspecies is clearly very rare and all records are from lowland rain forest below 500m, from January to August. Andrés Orellana (pers. comm.) reports to me that he encountered two specimens feeding on fermenting fruits hanging on a *Bunchosia cornifolia* (Malpighiaceae) tree in August.

Specimens examined (3♂, 4♀):

PANAMA (3♂, 4♀): *Colón*: Colón (Sta. Rita) 1500' Jan. 1♂ USNM; nr. Colón 1000' Mar. 1♀ USNM; *Panamá*: Cerro Jefe 900m Mar. Apr. 3♀ USNM; Summit C.Z. Mar. May 2♂ USNM.

Adelpha melona deborah Weeks, 1901 **stat. rest**.

Figs. **63i,j**; *296*

Adelpha deborah Weeks (1901: 353)

TL: Colombia. **Types**: **MCZ**: **ST**♂: "Strecker can't May '99//Syntypus//Adelpha deborah//767 Slide no. M.C.Z.//Type//In British Museum from Bogotá unnamed//This specimen photographed for G. Lamas by A. Aiello Jan. 1981"; **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//10//[Bogotá] 98-234 from H. Ellis Bolivia//Type" [examined]

Adelpha melona deborah Weeks, Lamas & Small (1992); *Adelpha deborah* Weeks, Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from all others by the lack of a white postdiscal band on the DHW. There is slight individual variation in the width of the orange DFW band.

Weeks (1901) described this taxon in a paper entitled "Description of nine new Bolivian butterflies", but the habitat is listed as "Colombia", and the only information on the specimen(s) on which the description was based is a comment that a single specimen "of this has been found in the British Museum collection without a name". This is the BMNH syntype, though the MCZ specimen, from Weeks collection, is presumably that on which the description was founded, since Weeks (1911: pl. 34) later figured a specimen that corresponds exactly in wing pattern to the latter specimen. Most subsequent authors have regarded the taxon as a distinct species (Fruhstorfer, 1915; Hall, 1938; D'Abrera, 1987), but Lamas & Small (1992) placed it as a subspecies of *A. melona*, since the variation in the DHW postdiscal band in *A. melona neildi*, from Panama, shows the presence or absence of this band to be a relatively weak character. Furthermore, the genitalia do not differ from typical *A. melona* and the taxon is clearly parapatric with respect to *A. melona neildi* and *A. melona leucocoma*. Neild (1996) accorded it specific status, with reservations, and I place it once more as a subspecies of *A. melona* (**stat. rest.**).

Range: This subspecies occurs west of the Cordillera de Mérida in Venezuela to northwestern Ecuador, west of the Andes. The variation in the white DHW postdiscal band in *A. m. neildi* suggests that *A. m. deborah* may also occur in eastern Panama, and intergrades to *A. m. neildi* in central Panama. The single record from "Palo Alto, Río Tigre" in Venezuela is probably an error, since this locality appears to be in northeastern Venezuela within the range of *A. melona leucocoma*.

Habitat and adult ecology: This subspecies is rare throughout its range, and occurs in wet lowland rain forest from near sea-level up to 800m. I have only encountered it twice; one male was attracted to a trap baited with rotting fish, 5m above the ground in a deep river canyon lined with forest, in bright sun, at around 11am. After circling the trap several times the butterfly landed on my hand and began to feed on sweat. I also once observed several males perching along a 200m stretch of road lined with secondary forest, in the middle of a very hot, sunny day. Individual males appeared to occupy territories of 50m or so along the road, and perched on bushes 4-5m above the ground. They frequently patrolled up and down the road, and encounters with other males led to vigorous, spiralling chases.

Specimens examined (25♂):

VENEZUELA (2♂): *Trujillo*: La Gira Betijoque 570m Dec. 1♂ AFEN; *Not located*: Palo Alto, Río Tigre Oct. 1♂ USNM-error. **COLOMBIA** (20♂): *Boyacá*: Muzo 1♂ BMNH; Otanche Feb. Apr. Aug. 4♂ JFL, 1♂ ESM; *Caldas*: Río de la Miel Mar. 1♀ ESM; *Cundinamarca*: Bogotá 2♂ BMNH; Bogotá-Bolivia 1♂ BMNH; env. de Bogotá 3♂ BMNH; *Santander*: El Centro 1♀ AMNH; La Soledad Dec. 1♂ AMNH; *Tolima*: Río Chili Apr.-Jun. 2♂ BMB; *Valle del Cauca*: Zacarias, Río Dagua 70m Mar. 1♂, 1♀ LMC; *Not located*: no specific locality 2♂ BMNH, 1♂ ZMHU, 1♂ AMNH. **ECUADOR** (1♂): *Esmeraldas*: Río Piguambí 800m Jul. 1♂ KWJH. "**PERU**" (1♂): no specific locality 1♂ BMNH-error. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ MCZ.

Additional locality data: **ECUADOR**: *Esmeraldas*: La Chiquita 50m May (Willmott & Hall, sight records).

Adelpha ethelda (Hewitson, 1867)

Figs. **64**; 155; 238; *296*

Identification, taxonomy and variation:

This species can be distinguished from *A. epione* by the less rounded hindwing which has a more angled apex, a broader tornus and a more dentate distal margin. The majority of subspecies also have, on the VHW, the distal margin of the postdiscal band slightly concave, a complete row of silvery grey submarginal spots, a more complete red-brown outer postdiscal series, and an orange DFW band. There is variation in the colour of the DFW band, its width and orientation, the presence on the DHW of an orange band, and the expression of the VHW postdiscal band and distal series, and six subspecies are recognised.

The systematic status of the taxon treated here as *A. ethelda* is open to debate, since it appears to be paraphyletic with respect to *A. epione*. *Adelpha epione* and *A. ethelda* share many distinctive local and universal synapomorphies, including: the complete loss of the postdiscal series anterior of vein Cu_1 on the forewing (the postdiscal series and postdiscal band could also be fused, but an examination of *A. melona*, probably closely related to these species, suggests a loss is more likely), the entire loss of the outer submarginal series on the ventral surface on both wings and its replacement with a red-brown border, the replacement of the inner and outer postdiscal series on the VHW by red-brown bands, and the VHW postdiscal band being displaced basally to border the third discal cell bar, while the first and second appear to be fused to form a single dark line. The fusion of many of the principal character elements on the VFW and otherwise highly modified wing pattern makes it difficult to place these two species within the genus. However, the male genitalia, which are indistinguishable, have dorsally pointing spines at the distal tip of the valvae and a relatively elongate clunicula, strongly resembling those of *A. melona*, *A. iphiclus* and relatives of the latter species. Sparse orange-brown scaling at the base of the DFW, and the expression of the outer postdiscal series on the DHW, are two characters usually found in more primitive *Adelpha* (Willmott, 1999, in prep.), where I have preliminarily placed these taxa for the present. DeVries (1987) states that the immature stages are similar to *A. cytherea*, also consistent with a relatively primitive position in the genus.

Since I am unable to isolate with certainty the sister species of *A. ethelda/epione*, although it may well be *A. melona* (see under that species), an analysis of the relationships of their constituent taxa is more complicated. The reduced white VHW postdiscal band occurs only in *galbao*, *epione* and *agilla*, as does the extensive orange scaling in the cell posterior to vein 3A on the VHW. Since these characters do not occur in *A. melona* or any *A. iphiclus* group members, or other relatively primitive *Adelpha*, I regard them as synapomorphies. The taxa *epione* and *agilla*, treated here as *A. epione*, both share a rounded hindwing shape and white DFW band, both of which appear to be local synapomorphies uniting them as sister taxa. There are thus several possible ways of classifying the taxa of *A. ethelda* and *A. epione*, depending on taxonomic philosophy. Adopting a phylogenetic species definition, since *A. epione* and *A. ethelda* form a monophyletic group, and excluding *A. epione* would make the resulting group paraphyletic, the taxa should be regarded as forming a single species. My reasons for not following this approach concern the close proximity of *A. epione agilla* and *A. ethelda zalmona* in Colombia and the complete lack of evidence that these taxa intergrade, or that there is, or has been for a substantial period of time, any gene flow between them. Since areas of the Cordillera Oriental extend below 1500m, these taxa, which both occur above 1500m elsewhere in their range, might be expected to cross from one slope to the next. This seems to happen in *A. lycorias*, which has a similar altitudinal range, and intermediate specimens between the east Andean *A. lycorias lara* and *A. lycorias melanippe* are known to occur. To date there are insufficient locality data from Colombia to determine whether *A. epione agilla* and *A. ethelda zalmona* are sympatric, but a consensus suggests that they are not, *A. epione agilla* occurring on the eastern slopes and *A. ethelda zalmona* on the west. *Adelpha epione agilla* is more closely related to *A. epione epione* from southeastern Brazil, and then to *A. ethelda galbao*, than to *A. ethelda zalmona*, from which it is separated by only a few tens of kilometres. Adopting a more biological species definition, I regard it as highly unlikely that *A. epione agilla* and *A. ethelda zalmona* would be able to, or do, freely and successfully interbreed under natural conditions, and therefore I prefer to regard them as distinct species, for the present. The systematic position of *galbao* is purely arbitrary, but since there is no evidence that *A. ethelda* is monophyletic with its exclusion, and given its closer overall similarity to *A. ethelda* in the more visually obvious characters of wing shape and pattern, I prefer to treat it as a subspecies of *A. ethelda*.

Range and status: Mexico (Chiapas) to western Ecuador, throughout Colombia west of the Cordillera Oriental to northwestern Venezuela on the western slopes of the Cordillera de Mérida, with a single disjunct subspecies in the Guianan highlands from Venezuela to French Guiana. Males not uncommon in lower montane rain forest and cloud forest habitats from 100-2000m, females very rare.

Specimens examined: 281 (274♂, 7♀)

Adelpha ethelda ethelda (Hewitson, 1867)

Figs. **64a,b**; *296*

Heterochroa ethelda Hewitson (1867a: 47, pl. 26, fig. 3, 4)

TL: Quito [Ecuador]. **Types**: **BMNH**(T): **ST**♂: “B.M. TYPE No. Rh. 9816 Heterochroa ethelda ♂ Hew.//Quito Hewitson Coll. 79-69 Heterochroa ethelda. 1.//Type//Syntype” [examined]

Adelpha ethelda Hew., Kirby (1871)

Identification, taxonomy and variation:

This subspecies is distinguished from all others by the orange band on the DHW. There is little variation in the specimens examined.

Hewitson (1867a) described and figured both surfaces of this species from an unspecified number of male specimens, and there has never been any confusion as to its identity. A syntype is in the BMNH. Although this subspecies is superficially very distinct from the remaining subspecies, it is parapatric, shares all important wing pattern and genitalic characters with these subspecies and occurs at similar altitudes in similar microhabitats. Furthermore, I have examined two specimens, one of which is in the AME and was figured by Steinhauser & Miller (1977) as an aberration of *Adelpha eponina* (fig. 19, 20, in that work, Fig. 64c,d, here), which are phenotypically intermediate between *A. e. ethelda* and typical *A. e. eponina*. Despite the similarity of the dorsal surface with *A. leuceria*, the species are not closely related and the pattern is achieved in each species through different modifications of the wing pattern ground plan. In *A. ethelda*, the orange DHW band represents the fusion of the inner and outer postdiscal series, while the postdiscal band is absent, whereas in *A. leuceria* the orange DHW band is the postdiscal band and the postdiscal series are absent. The same may also be true of the DFW band, although it is difficult to say how this is derived in *A. ethelda* (see species introduction).

Range: Western slopes of the Andes from Colombia (Tambito) to northern central Ecuador.

Habitat and adult ecology: This subspecies remained something of a rarity for many years following its description, the type being the only specimen known to Fruhstorfer (1915). Samson (1978) summarised all the data then known on this subspecies, concluding that it was restricted to cloud forests of the western Ecuadorian Andes. In my experience this is the case, and I have found it to be common during the late wet season and early dry season in both heavily disturbed and primary forest from 700-1900m. Males are typically encountered along rivers and forest edges, where they puddle at damp sand, and may be attracted to traps baited with rotting fish or banana. I have never seen the female in the field, and only a single specimen in collections. It is tempting to speculate that the marked difference in the dorsal pattern of this subspecies with respect to others is the result of mimicry, although the only species in western Ecuador with a similar pattern is *A. leuceria*. This species is much more rarely encountered, at least by the lepidopterist, although it does occupy a similar elevational range.

Specimens examined (23♂, 1♀):
COLOMBIA (3♂): *Cauca*: Tambito 1200m 22/3/96 T. Pyrcz 1♂ JFL; *Nariño*: El Palmar, Aug. ‘45 1300m K. von Sneidern 1♂ AMNH; “*Santander*”: La Belleza Aug. 1♂ ESM-error. **ECUADOR** (19♂, 1♀): *Carchi*: Las Juntas, Río Golondrinas 1400m Nov. 1♂ KWJH; *Chimborazo*: Huigra 25-3000' Feb. 2♂ BMB; *Imbabura*: Paramba 1♂ BMNH, 1♂ BMB; “*Napo*”: Misahuallí 1♂ MUSM-error; *Pichincha*: Alluriquín Aug. 1♂ USNM; Quito 1♂ BMNH, 1♀ AMNH; Río Las Palmeras 1900m Aug. 1♂ KWJH; Río Tanti 750m Jul. Aug. 3♂ KWJH; Sto. Domingo 4♂ AMNH; *Not located*: Baños/Sto. Domingo area 2♂ BMNH; W. Ecuador Feb. 1♂ BMB. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMB.

Additional locality data: **ECUADOR**: *Carchi*: Lita, ridge east of Río Baboso Jul.; *Esmeraldas*: El Encanto Jul.; Río Chuchuví Jul.; Río Piguambí Jul.; *Imbabura*: Río Verde 1200-1450m Aug.; *Pichincha*: Río Tanti May Jun. (Willmott & Hall, sight records).

Adelpha ethelda eponina Staudinger, 1886 **stat. nov.**

Figs. **64c-f**; *296*

Adelpha epione eponina Staudinger (1886: 143)

TL: Cauca Province, Colombia. **Types**: **ZMHU**: **HT**♂: “Eponina Stgr.//Cauca [illegible]//Origin//Syntype” [examined]

=*Adelpha eponina volupis* Fruhstorfer (1915: 512)

TL: Río Aquaca Valley, Colombia. **Types**: **BMNH**(T): **ST**♂: “Fruhstorfer Coll. B.M. 1933-131//eponina volupis Fruhst.//Río Aguacatal Colomb. W. Cord. 2000m Coll. Fassl//TYPE//Type// Syntype” [examined]

Adelpha zalmona eponina Stdgr., Hall (1938); =*Adelpha zalmona* Hew., D’Abrera (1987) form

Identification, taxonomy and variation:

This subspecies is easily distinguished from all others by the white DFW band. It also differs from *A. e. zalmona* and *A. e. sophax* in having a fully developed silvery grey VHW postdiscal band and a well developed orange-brown outer postdiscal series. It is distinguished from *A. epione* by the concave, instead of convex, distal edge of the red-brown band distal of the silvery VHW postdiscal band, by the silvery inner submarginal series of spots on the VHW, by the less rounded hindwing and by the white instead of orange cell posterior of vein 3A. The thickness of the DFW band is subject to individual variation and it may or may not reach tornus.

Staudinger (1886) described this taxon as a subspecies of *A. epione* based on a single specimen from Cauca Province in Colombia, and the holotype is in the ZMHU. Hall (1938) placed it as a subspecies of *A. zalmona*, Fruhstorfer (1915) and Steinhauser & Miller (1977) regarded it as a full species, while D’Abrera (1987) considered it to be an infrasubspecific form of *A. zalmona*. Since it is closely parapatric and has all the VHW characters typical of *A. ethelda* (see general identification section), I place it as a subspecies of that species (**stat. nov.**). Fruhstorfer (1915) described the taxon *volupis* from an unspecified number of specimens from the Río Aquaca valley at 2000m, and stated that it differed from *A. e. eponina* in having a narrower and less extensive white DFW band. Any differences apparent in the syntype in the BMNH (Fig. 64e,f) merely represent individual variation and the name was synonymised with *A. e. eponina* by Hall (1938).

Range: *Adelpha e. eponina* occurs along the western slope of Cordillera Occidental in Colombia, as far south as Río Calima, south of which it is replaced by *A. e. ethelda*. Other fragmentary data indicate that it probably occurs along the western slopes of the Cordillera Central at least as far north as Antioquia and along the eastern slope of the Cordillera Oriental. More accurate data are needed to assess the range of this subspecies with respect to *A. e. zalmona* and *A. e. ethelda*.

Habitat and adult ecology: Little has been reported on the habitat or behaviour of this subspecies, but it appears to be locally common in cloud forest habitats from 1000-2000m, where it appears to fly throughout the year. Its geographic and elevational ranges closely match those of the white-banded *A. lycorias melanippe*, and the two taxa are probably involved in mimicry.

Specimens examined (68♂): † - trans. to *A. e. ethelda*.

COLOMBIA (68♂): *Antioquia*: Antioquia 1♂ ZMHU; *Caldas*: Manizales 1♂ BMNH; "*Boyacá*": Muzo Apr. 1♂ USNM-error; *Chocó*: San José del Palmar Jan. 3♂ JFL; "*Cundinamarca*": Bogotá 3♂ BMNH-error; *Risaralda*: Distrito de Pereira 2♂ BMNH, 1♂ BMB; Quebrada Río Negro, area a Pblo. Rico 1550m Aug. 2♂ MHNUC; Río Tamaná 2500' Aug. 1♂ BMNH; *Valle del Cauca*: Cali-Buenaventura 1000m Mar. 2♂(1†) ESM; Farallones, km 55 1200m Jul. 1♂ KWJH; Juntas Dec. 2♂ BMNH, 1♂ ZMHU; Lago Calima Oct. 1♂ ESM; Queremal 1200m Jul. 1♂ LMC; bet. Queremal & Buenavista 3500-4000' Feb. 2♂ AMNH; Río Aguacatal 2000m 2♂ BMNH, 1♂ BMB, 1♂ MCZ; Río Anchicayá 1000-1150m Oct. Dec. Jan. Feb. 12♂(1†) AME; Río Bravo, Calima May 1♂ LMC; Río Calima 1300m Nov. Jan. 3♂ AME; Río Dagua 600-1600m Sep. 6♂ BMNH, 5♂ ZMHU, 1♂ LMC; Valle 1♂ JFL; Yatacué, Alto Anchicayá Aug. 2♂ LMC; *Not located*: Cauca 2♂ BMNH, 1♂ ZMHU; Quibdó-Bolívar 1000m Feb. 1♂ ESM; Villa Eloira 1♂ BMNH; no specific locality 1♂ BMNH, 1♂ BMB, 1♂ AMNH.

Adelpha ethelda zalmona (Hewitson, 1871) **stat. nov.**

Figs. **64g,h**; *296*

Heterochroa zalmona Hewitson (1871: 165)

TL: New Granada [Colombia]. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//14// N. Granada Hewitson Coll. 79-69 Heterochroa zalmona 1.//B.M. TYPE No. Rh. 9796 Heterochroa zalmona ♂ Hew.//zalmona//Type//Syntype"; **BMNH**(M): **ST**?♂: "N. Granada Hewitson Coll. 79-69 Heterochroa zalmona 2."; **ST**?♂: "N. Granada Hewitson Coll. 79-69 Heterochroa zalmona 3" [all examined]

Adelpha zalmona Hew., Kirby (1871); *Adelpha zalmona zalmona* Hew., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. e. sophax* by the more irregular distal edge of the orange DFW band in cells Cu_2-Cu_1 and Cu_1-M_3, which is straight in *A. e. sophax*, and by the duller black-brown postdiscal area on the VHW, with the outer postdiscal series represented by a pale greyish line instead of a red-brown line. Although these differences are slight, they are consistent and also suggest that *A. e. sophax* may be more closely related to *A. e. eponina*, which shares both of these characters, than to *A. e. zalmona*. *Adelpha ethelda* ssp. nov. is distinguished under that taxon. There is little variation in this subspecies, except in two specimens, listed below, that are transitional to *A. e. sophax* and *A. e. eponina*.

Hewitson (1871) described this taxon based on an unspecified number of specimens in the collection of Saunders and Hewitson, and I have examined a syntype (Fig. 64g,h) and two further possible syntypes in the BMNH which correspond well with the original description. This taxon and remaining subspecies have usually been considered as a species distinct from *A. ethelda ethelda*, but for the reasons discussed under that subspecies I treat them all as conspecific and therefore place *zalmona* as a subspecies of *ethelda* (**stat. nov.**).

Range: This subspecies occurs from Colombia, where it is found from the northern tip to the eastern slopes of the Cordillera Central south to southern Tolima, and on the western slope of the Cordillera Oriental from Bogotá to Santander, northwards to the western slopes of the Cordillera de Mérida in Venezuela. Although it has yet to be recorded in the Sierras de Perijá and Nevada de Santa Marta in Colombia, it probably occurs there also.

Habitat and adult ecology: Judging from the number of specimens in collections this subspecies is locally common throughout its range. Neild (1996) reports that males are typically encountered as solitary individuals along forest edges, often puddling on trails. It has been recorded from 400-1000m throughout the year.

Specimens examined (144♂): **†** **-** trans. to *A. e. eponina*, whitish in middle of DFW band.

COLOMBIA (133♂): *Antioquia*: Frontino 2♂(1†) BMNH-error?; Medellín 3♂ BMB; Mesopotamia 1♂ AMNH; Valdivia 3♂ BMB; *Boyacá*: Muzo 4-800m Jun. Jul. 1♂ BMNH, 3♂ AME, 1♂ USNM, 20♂ BMB; Otanche Jan. May Aug. 5♂ JFL; *Caldas*: Victoria 1♂ ESM; *Cundinamarca*: Bogotá 17♂ BMNH, 4♂ USNM, 17♂ BMB, 1♂ MNHN; env. de Bogotá 11♂ BMNH; head Río Carare 2-5000' 2♂ USNM; *Santander*: La Lechera 850m Feb. 2♂ AMNH; La Soledad Dec. 1♂ AMNH; Río Opón Dec. 1♂ AMNH; Río Quirata 5-700m Nov. Dec. 1♂ AMNH; *Tolima*: Río Chili Apr.-Jun. 3♂ BMNH, 1♂ BMB; "*Valle del Cauca*": Cali 1000m Oct. Nov. 2♂ MUSM-error; *Not located*: Pipiral 1♂ MNHN; no specific locality 20♂ AMNH, 4♂ BMNH, 2♂ ZMHU, 3♂ BMB. **VENEZUELA** (2♂): *Trujillo*: La Gira Betijoque 520m Dec. 2♂ AFEN. "**PERU**" (1♂): no specific locality 1♂ BMB-error. **COUNTRY UNKNOWN** (8♂): no specific locality 6♂ MCZ, 2♂ USNM.

Adelpha ethelda sophax Godman & Salvin, 1878 **stat. nov.**

Figs. **64i,j**; 155a,b; 238a,b; *296*

Adelpha sophax Godman & Salvin (1878b: 265)

TL: Cache, Costa Rica. **OTL**: Costa Rica; New Granada. **Types**: **BMNH**(T): **LT**♂: "B.M. TYPE No. Rh. 9797 Adelpha sophax ♂ G. & S.//Type. sp. figured//B.C.A. Lep. Rhop. Adelpha sophax G. & S. Godman-Salvin Coll. 1916.-4.//Cache Costa Rica H. Rogers//Type H.T.//Syntype//♂"; **BMNH**(M): 2**PLT**?♂: "B.C.A. Lep. Rhop. Adelpha sophax G. & S. Godman-Salvin Coll. 1916.-4.//Cache Costa Rica H. Rogers"; **PLT**?♂: "B.C.A. Lep. Rhop. Adelpha sophax G. & S. Godman-Salvin Coll. 1916.-4.//Cache Costa Rica H. Rogers//♂//16 71"; **PLT**?♂: "Bogotá, Colombia C. Felder//B.C.A. Lep. Rhop. Adelpha sophax G. & S. Godman-Salvin Coll. 1916.-4." = *ethelda zalmona* [all examined]

Adelpha zalmona sophax G. & S., Fruhstorfer (1915), Lamas & Small (1992)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. e. zalmona* and *A. ethelda* ssp. nov. under each of those subspecies. Costa Rican specimens differ from Panamanian specimens by the orange on the DFW extending over the outer submarginal series in the tornus. This is a minor and slightly variable difference, and there is otherwise little variation in the series examined.

Godman & Salvin (1878b) appear to have been unaware of the Hewitson's (1871) description of *zalmona* when they described this taxon, since they only mentioned *A. epione* and *A. boreas* in the original description and described it as a full species. The description was based on an unspecified number of male specimens from Costa Rica, collected by H. Rogers, and Colombia, all in their own collection, and I have examined a number of valid and possible syntypes in the BMNH. The single Colombian specimen is referable to the older name *A. e. zalmona*, so to preserve the name *sophax* for the Costa Rican subspecies, as it has been used by subsequent authors (DeVries, 1987; Lamas & Small, 1992), I designate the specimen figured as this taxon by Godman & Salvin (1884) as the lectotype of *Adelpha sophax*, with the following label data: "B.M. TYPE No. Rh. 9797 Adelpha sophax ♂ G. & S.//Type. sp. figured//B.C.A. Lep. Rhop. Adelpha sophax G. & S. Godman-Salvin Coll. 1916.-4.//Cache Costa Rica H. Rogers//Type H.T.//Syntype//♂" (Fig. 64i,j). For the reasons discussed under the nominate subspecies I consider *sophax* to be a subspecies of *A. ethelda* (**stat. nov.**).

Range: To date this subspecies is known only from central Panama to Costa Rica, where it occurs on both slopes of the Cordillera Central and Talamanca. It may well also occur in Nicaragua.

Immature stages: The egg is pale green and deposited singly, up to several times per plant (DeVries, 1986, 1987: Costa Rica). The mature larva is mottled dark and pale brown, with scoli similar to *A. cytherea*, and the head capsule is dark brown with short lateral spines (DeVries, 1987). The pupa is apparently similar to *A. cytherea*. Both these brief descriptions suggest a rather different early stage morphology from *A. melona*, but unfortunately I have been unable to examine any early stage material or adult voucher specimens, and the relationships of this species within the genus remain uncertain.

Larvae are solitary and feed on new, then old leaves of plants along roadsides and riparian edges, in bright sun (DeVries, 1986). They also make frass chains and rest in later instars on damaged portions of the leaf (DeVries, 1987).

Habitat and adult ecology: DeVries (1987) reports this subspecies to be locally common from 500-1200m on the Atlantic slope in cloud forest habitats, particularly in the February-March dry season. Males may be encountered perching as solitary individuals along forest edges and river sides during sunny periods in the morning, up to around 10:00am. Hall & Willmott (1993) reported the species from the Pacific slope, where males were observed perching around 10m above the Río Angel, in small groups. In my experience, the general behaviour of this subspecies is similar to that of the nominate.

Specimens examined (25♂, 3♀):
PANAMA (13♂, 1♀): *Chiriquí*: Bugaba 2♂ BMNH; Chiriquí 3♂, 1♀ ZMHU, 2♂ USNM, 1♂ BMB, 1♂ MCZ; *Colón*: Piña Jul. 1♂ AME; *Panamá*: Cerro Campana 2500' Jun. Sep. 1♂ FSCA, 2♂ USNM. **COSTA RICA** (12♂, 2♀): *Alajuela*: Río Angel, nr. Cariblanco 750m Sep. 2♂, 1♀ KWJH; *Cartago*: Cache 4♂, 1♀ BMNH; Juan Viñas 1♂ USNM; Tuis 1♂ USNM; *Not located*: no specific locality 1♂ BMNH, 1♂ ZMHU, 2♂ BMB.

Adelpha ethelda ssp. nov.

Figs. **64k,l**; *296*

Adelpha sophax G. & S., de la Maza & de la Maza (1985); *Adelpha zalmona sophax* G. & S., de la Maza & de la Maza (1993).

Identification, taxonomy and variation:

This subspecies is distinguished from *A. e. sophax* by the much more diagonal DFW orange band, which is thinner, of more even width, and does not cover the outer submarginal series in the DFW tornus. There is little variation in the specimens examined.

This subspecies is represented in several collections, including, in addition to those listed below, the collection of Mast de Maeght in Brussels, where there is at least one male from Chiapas, according to a photograph taken by Yves Hiernaux in the drawer containing *A. e. zalmona* at the BMNH. I do not describe it here since Lee and Jacqueline Miller (pers. comm.) have been intending to describe it for some time and will do so shortly.

Range: To date this subspecies is known only from Mexico, from the Atlantic slopes in the states of Oaxaca, Veracruz and Chiapas, though the majority of specimens are from the latter state. It almost certainly occurs in Guatemala, and possibly also to Honduras.

Habitat and adult ecology: De la Maza & de la Maza (1993) report this subspecies, as *A. zalmona sophax*, from humid lowland rain forest in Chiapas from 100-500m. Judging from the number of specimens in collections and the range of sites recorded by de la Maza & de la Maza (1993), it is not uncommon in the field. It has been collected from August to December and once in May.

Specimens examined (12♂, 3♀):
MEXICO (12♂, 3♀): *Chiapas*: "Chiapas, Mex coll. W. Schaus" 1♂ USNM; Comitán Nov. 1♀ AME; Río Chixoy Aug. 6♂ AME; *Oaxaca*: Chimalapa Dec. 1♀ AME; Río Sarabia Sep. Oct. 1♂, 1♀ AME; Zuzla [??] May 1♂ AME; *Veracruz*: "Franca Vieja, V.C., Mexico VIII '44. M. Guerra, coll. Frank Johnson Donor" 1♂ AMNH; "Pajaritas, V.C., Mex. VIII 1944 M. Guerra, coll. Frank Johnson Donor" 1♂ AMNH; San Manuel Oct. 1♂ AME; *Not located*: photo in drawer of specimen from Mexico 1♂ BMNH.
Additional locality data: **MEXICO**: *Chiapas*: Chajul 150m (de la Maza & de la Maza, 1985); Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona (de la Maza & de la Maza, 1993).

Adelpha ethelda galbao Brévignon, 1995 **stat. nov.**

Figs. **64m,n**; *296*

Adelpha epione galbao Brévignon (1995: 17, fig. 25, 26)

TL: Saül, French Guiana. **Types**: **LCB**: **HT**♂: Saül, 3 Sep. 1993 [original photograph examined]; **JYG**: **2PT**♂: same locality data as HT except Sep. 1982, 5 Sep. 1987; **Musée Départmental de Cayenne**: **PT**♂: same locality data as HT, Nov. 1970, coll. R. P. Barbotin [not examined]

Identification, taxonomy and variation:

This subspecies is distinguished from all others by the broader, more vertically orientated orange DFW band, which is slightly paler in the basal half, by the silvery grey VHW postdiscal band being reduced to a spot near the costa, and by the orange shading over the cell posterior to vein 3A. The two specimens I have examined are very similar in wing pattern.

Brévignon (1995) described this taxon as a subspecies of *A. epione*, with which it shares the reduced VHW postdiscal band, and the cell posterior of vein 3A on the VHW being orange. These two characters appear to be local synapomorphies which group *A. epione epione*, *A, epione agilla* and *galbao*. The systematic placement of *galbao* depends, however, on the adopted species definition, and I place it as a subspecies of *A. ethelda* (**stat. nov.**) for the reasons given in the discussion of this species.

Range: This recently discovered subspecies is known from two sites approximately 1400km apart, one in southern Venezuela and one in French Guiana, but obviously it must be more widespread, presumably occurring throughout the Guiana shield area in montane areas. Even so, its range is clearly disjunct with respect to remaining *A. ethelda* subspecies.

Habitat and adult ecology: This subspecies is very rare in collections, and I have seen no specimens in any that I have examined. In addition to the original description, I have also examined a photograph, courtesy of Andrew Neild, of a specimen captured by Roberto de la Fuente in southern Venezuela. According to Brévignon (1995), males may be encountered in areas of secondary growth during the hottest hours of the day.

Specimens examined (2♂):
VENEZUELA (1♂): *Amazonas*: Ashidowa Teri. Alto Siapa 1♂ DLF(photograph). **FRENCH GUIANA** (1♂): *Laurent du Maroni*: Saül Sep. 1♂ LCB(photograph).

Adelpha epione (Godart, [1824])

Figs. **65**; 156; 239; *296*

Identification, taxonomy and variation:

This species is most closely related to *A. ethelda*, from which it is distinguished by the rounded hindwing shape, with the hindwing apex less angular and the distal margin less dentate, and the oblique white band on the DFW, which also occurs in *A. ethelda eponina*. *Adelpha ethelda eponina* is further distinguished by several characters on the VHW, including a complete silvery grey postdiscal band, a complete orange-brown outer postdiscal series, and a complete submarginal series of silvery grey spots. I discuss other distinctive characters of this species under *A. ethelda*. There is geographic variation in the shape of the white DFW band and the expression of the VHW postdiscal series, and two subspecies are recognised.

This species appears to be monophyletic, but its recognition as distinct from *A. ethelda* probably makes that species paraphyletic, and my reasons for retaining both species are discussed under *A. ethelda*.

Range and status: Eastern slopes of the Andes from Colombia to Bolivia, to southeastern Brazil. Not uncommon in lower montane cloud forest habitats up to 1600m, but also occurring in lowland rain forest as low as 200m up to 200 km away from the Andes.

Specimens examined: 343 (333♂, 10♀)

Adelpha epione epione (Godart, [1824])

Figs. **65a,b**; *296*

Nymphalis epione Godart ([1824]: 342, 405)

TL: Brazil. **Types**: **MNHN**?: **ST**♂: [not located]

Adelpha epione Godt., Kirby (1871)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. epione agilla* by the narrower white DFW band, which is of more even width and has more even distal and basal margins, and on the VHW by having traces of the silvery grey spots of the inner submarginal series, by the postdiscal band being narrower with a straighter distal edge, and by the red-brown outer postdiscal series being uniformly faint throughout instead of more pronounced in its anterior half. There is little variation in the specimens examined.

Godart ([1824]) described this species based on males from Brazil, and since the description refers to the oblique white DFW band and five reddish brown bands on the VHW, corresponding to the basal band, the discal cell band, and the inner and outer postdiscal and outer submarginal series, there can be no doubt as to its identity. I have been unable to locate any syntype specimens in the MNHN. The name *maina*, introduced by Martín *et al*. ([1923]) as a subspecies of *A. epione*, is a *nomen nudum*.

Range: Southeastern Brazil, from Espírito Santo to São Paulo and Minas Gerais.

Habitat and adult ecology: This subspecies is uncommon in collections and there are no published observations of it in nature.

Specimens examined (27♂, 5♀):

BRAZIL (27♂, 3♀): *Espírito Santo*: no specific locality 1♂, 2♀ BMNH; *Minas Gerais*: no specific locality 1♂ BMNH; *Rio de Janeiro*: Petrópolis 3♂ BMNH; Rio de Janeiro 1♂ ZMHU; *São Paulo*: Araçatuba 450m 3♂ BMNH; Bahuru 3♂ BMNH; Casa Branca 2♂ BMNH, 1♂ ZMHU; Rio Batalha 1♂ BMNH; São Paulo 6♂ BMNH, 2♂ BMB; *Not located*: no specific locality 1♂, 1♀ BMNH, 1♂ BMB, 1♂ MNHN. **COUNTRY UNKNOWN** (2♀): no specific locality 2♀ BMNH.

Adelpha epione agilla Fruhstorfer, 1907

Figs. **65c,d**; 156a,b; 239a,b; *296*

Adelpha epione agilla Fruhstorfer (1907: 172)

TL: Colombia. **Types**: **BMNH**(T): **HT**♂: "epione agilla Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Columbien ex coll. Fruhstorfer// TYPE//Holotype//Type" [examined]

Adelpha epione Godt., Staudinger (1886) in part

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account. There is little variation except in a single specimen from Upper Paraguay River, which is intermediate in wing pattern to the nominate subspecies, having a broad but evenly edged white DFW band.

Fruhstorfer (1907) described this subspecies based on a single male collected by Stichel in 1896 in Colombia, and the putative holotype is in the BMNH (Fig. 65c,d). He described several differences such as the broader white DFW band and dark silver-grey VHW postdiscal band, and cited the latter character as distinguishing it from *A. ethelda eponina*.

Range: Colombia to Bolivia, across to northern Paraguay (by range extrapolation). In Colombia it seems to occur only on the eastern slopes of the Cordillera Oriental. There are several specimens labelled as from localities west of here, such as Antioquia and Muzo, but I regard these as probable mislabellings and believe that its presence outside the eastern slope has yet to be demonstrated.

Habitat and adult ecology: This taxon is rather local but can be common in relatively undisturbed habitats, and typically occurs in cloud forest from 600-1600m, although individuals may also be found as far as 200 km from the base of the Andes in flat lowland rain forest at around 200m. Males are usually encountered along mountain rivers puddling at damp sand, and are also attracted to rotting fish in traps along forest edges or in light gaps. They may also be seen perching 5-7m above the ground on the tops of bushes in large forest light gaps along streams. Females are much rarer than males, the only individual I have seen was flying low along a wide ridge top path with abundant secondary growth in the early afternoon. The subspecies seems to fly throughout the year.

Specimens examined (306♂, 5♀): † - trans. to *A. epione epione*.

COLOMBIA (58♂, 1♀): "*Antioquia*": Río Cocorná 800-1000m Aug. 1♂ AMNH-error; "*Boyacá*": Muzo 2♂ AME-error; Santa María Dec. 1♂ ESM; *Cundinamarca*: Bogotá 14♂ BMNH, 2♂, 1♀ USNM, 1♂ BMB; env. de Bogotá 9♂ BMNH; *Meta*: Villavicencio Jan. 1♂ ESM; *Not located*: no specific locality 21♂ AMNH, 2♂ BMNH, 1♂ ZMHU, 1♂ AME, 2♂ USNM. **ECUADOR** (65♂, 1♀): "*Chimborazo*": Río Bamba 1♂ AME-error; *Morona-Santiago*: Macas Oct. 2♂ AMNH, 1♂ BMNH; Méndez 850m Oct. 1♂ MJP; Méndez-Santiago rd., km 40, Oct. 1♂ MJP; Río Abanico 1600m Nov. 1♀ KWJH; 2°-4°S, 78°W 875m Nov. Dec. 1♂ AMNH; *Napo*: Talag Sep. 1♂ DAT; Yasuní 300m Aug. 1♂ KWJH; *Pastaza*: Hda. Moravia, nr. Shell Feb. 1200m 1♂ KWJH; Lorocachi, Río Cururay 200m Jul. 1♂ KWJH; Mera Oct. 1♂ AME; Puyo-Tena rd. Jun., km 17, 1♂ DAT; Río Llandia Nov. 1♂ DAT; Sarayacu 200m Mar. 1♂ AME; *Tungurahua*: Río Chinchin Grande 1400m Oct. 1♂ AME; Río Negro Jul. 2♂ FSCA; Río Tigre 1200m Aug. 1♂ AME; Río Topo 4500' Apr. Jun. Jul. Oct. 2♂ DAT, 1♂ JFL, 1♂ BMNH, 1♂ FSCA, 1♂ USNM; Río Zuñac 1300m Jul. 1♂ KWJH; Santa Inéz 1♂ MCZ; Yunguilla, nr. Baños Apr. 2♂ USNM; *Zamora-Chinchipe*: Quebrada Chorillos 1250m Apr. 1♂ KWJH; Zamora 3-4000' 16♂ BMNH; *Not located*: Oriente 3♂ AMNH; "Pacific slope" 2♂ USNM-error; no specific locality 3♂ BMNH, 1♂ MCZ, 1♂ JFL. **PERU** (105♂, 1♀): *Amazonas*: Falso Paquisha 800m Oct. 1♂ MUSM; Huambo 3700' 1♂ BMB; *Cuzco*: Callanga 1500m 1♂ ZMHU; Cosñipata Valley 1♂ BMNH; Hda. Cadena 1000m 1♂ MUSM; Marcapata 4500' 2♂ MUSM, 1♂ BMNH; Quincemil Nov. 1♂ MUSM; *Huánuco*: Divisoria Jun. 1♂ AME; Puente Cayumba, Río Huallaga 800m Apr. 7♂ AMNH, 1♂ MUSM; Tingo María 800m Mar. Jun. Jul. Nov. 2♂ FSCA, 3♂ AME, 1♂ MUSM; U. Marañon 1♂ BMNH; no specific locality 1400m Apr. 1♂ USNM; *Junín*: Alto Yurinaqui 1000m May 1♂ MUSM; Chanchamayo 1200-1400m Sep. 2♂ BMNH, 1♂ ZMHU, 1♂, 1♀ AME, 1♂ USNM, 2♂ BMB; La Merced 1♂ BMNH, 1♂ MUSM, 1♂ AMNH; Río Colorado 2500' Mar. Apr. Aug. Oct. 2♂ BMNH, 1♂ AME, 3♂ BMB; Río Ipoki May 1♂ MUSM; San Ramón 3000' Oct. 1♂ BMB; Satipo May Dec. 2♂ AME; *Loreto*: Iquitos 1♂ BMNH, 1♂ AMNH; Marotta Jul. 1♂ AME; Nauta 1♂ BMNH; Pebas 2♂ BMNH, 1♂ ZMHU; Río Cachiyacu 1♂ BMNH; Río Morona Jan. 1♂ AMNH; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Albergue Amazonia 600m Oct. 1♂ MUSM; Boca Río la Torre 300m Oct. Nov. 2♂ MUSM; Puerto Maldonado 250m Aug. 1♂ AME; *Pasco*: Pichis trail 600-1200m Apr. 1♂ ZMHU, 1♂ BMB; Pozuzo 800-1000m 10♂ BMNH, 1♂ MUSM; *Puno*: La Oroya-Agualani Oct. 1♂ BMNH; La Unión, Río Huacamayo 2000' Dec. 4♂ BMNH; Río Távara 450m Aug. 1♂ MUSM; San Gaban 2500' Mar. Apr. 1♂ BMNH; Sto. Domingo 1♂ BMNH; Yahuarmayo 1200' Feb. Mar. Oct. Nov. 3♂ BMNH; *San Martín*: Huayabamba 3500' 2♂ BMNH, 1♂ ZMHU; Jepelacio 1♂ AMNH; Moyobamba 1♂, 1♀ BMNH, 1♂ BMB; Río Huambo Feb. 1♂ MUSM; *Not located*: E. Peru 1♂ BMB; middle Río Ucayali Jun. Jul. 5♂ AMNH; Ucayali 1♂ ZMHU; S. Peru 1♂ BMB; no specific locality 2♂ AMNH, 1♂ BMNH, 1♂ USNM, 1♂ MCZ. **BOLIVIA** (64♂, 1♀): *Cochabamba*: Alto Palmar 1100m 1♂ MUSM; Charaplaya 1300m Jan. 1♂ BMNH; Cochabamba 4♂ BMNH; Cristal Mayo, Chaparé Mar. 1♂ JFL; El Palmar May 2♂ AME; 5 days N. Cochabamba 4♂ MCZ; San Mateo

1♂ BMNH; Yungas del Esp. Santo 1♂ BMB; *El Beni*: Cachuela Esperanza Sep. 2♂ AME; Muschay, Río Beni Aug. 3♂ BMNH; Reyes Jul. 2♂ BMNH; Río Quiquibby 600m Sep. 2♂ KWJH; *La Paz*: Coroico 1200-2000m May 1♂ BMNH, 1♂ ZMHU, 1♂ AME; Cusilluni May 1♂ BMNH, 1♂ MCZ; Guanay 1500' Aug. Oct. 1♂ JFL, 1♂ BMNH; Río Songo 1200m 1♂ ZMHU; San Ernesto 1000m Sep. 1♂ BMNH; Yungas 1200m Nov. 2♂ BMNH; no specific locality 3♂ BMNH, 1♂ ZMHU, 1♂ AME; *Santa Cruz*: Buenavista 400m Oct. 1♂ AMNH, 3♂, 1♀ AME, 1♂ MUSM; Prov. Sara Mar. Apr. 10♂ BMNH; Santa Cruz 2♂ USNM; *Not located*: no specific locality 3♂ AMNH, 3♂ BMNH, 1♂ BMB, 1♂ MNHN. **PARAGUAY** (1♂): *Presidente Hayes*: Santa Cruz, Up. Paraguay R. Sep. 1♂† BMNH. **COUNTRY UNKNOWN** (13♂, 1♀): no specific locality 4♂ BMNH, 3♂, 1♀ AME, 2♂ USNM, 3♂ MCZ.
Additional locality data: **ECUADOR**: *Napo*: Pimpilala 600m Sep.; *Pastaza*: Shell 1000m Apr.; *Zamora-Chinchipe*: Quebrada Chorillos 1250m Nov. (Willmott & Hall, sight records).

Adelpha syma (Godart, [1824])

Figs. **66a,b**; 157a,b; 240a,b; *297*

Nymphalis syma Godart ([1824]: 335, 374)
TL: Brazil. **Types**: **MNHN**?: **ST**: [not located]
=*Adelpha pravitas* Fruhstorfer (1913: pl. 107f; 1915: 522) **syn. nov.**
TL: [no locality stated]. **Types**: **BMNH**(R): **ST**♀: "syma forma pravitas Fruhst.//f. pravitas Fruhst.//R//107 f3//Syntype//TYPE" [examined]
Adelpha syma Godt., Hübner (1824: pl. 99, fig. 571, 572; 1827-1831: 37); *Heterochroa syma* Godt., Westwood (1850); *Adelpha syma* Godt., Fruhstorfer (1915)

Identification, taxonomy and variation:

The distinctly banded ventral surface and the very broad orange DFW marking distinguish this species from all others. There is little variation.

Godart ([1824]) described this species based on specimens from Brazil, and mentions the very large orange DFW marking and the ventral surface being entirely red-brown with white bands, lined with black, of which there were six on the forewing and five on the hindwing. There is therefore little doubt as to the identity of the species, despite the fact that no type specimens are known to exist, and both wing surfaces were figured shortly after by Hübner (1824). Fruhstorfer (1913) figured a specimen, as *pravitas*, which had the DFW postdiscal and DHW tornal orange markings entirely white, and later stated that he believed it to be an aberrant form of *A. syma* (Fruhstorfer, 1915). Since the female specimen in the BMNH(R), which is clearly that figured in the original description, does indeed represent an aberration, I synonymise *pravitas* with *syma* (**syn. nov.**).

Due to the highly modified wing pattern it is difficult to determine this species' relationships within the genus, but the male genitalia, the straight, continuous white postdiscal band on the VFW and the straight postdiscal series, suggest it may be related to *A. cytherea*.

Range: This species is known from the eastern Brazilian coast at Espírito Santo, south as far as Uruguay, and west across to northeastern Argentina and Paraguay. There are single records from Bahia and Natal, in Río Grand do Norte, which require confirmation, and three records from the Amazon which are certainly erroneous.

Immature stages: Hoffmann (1937a) reared this species in Santa Catharina and described the immature stages and behaviour in detail, and except where noted, the description below is compiled from his notes. Recently, Freitas *et al*. (in press) also reared this species in São Paulo, and they describe and figure the fifth instar and pupa. The egg is deposited singly at the point of a lateral "tooth" of a hostplant leaf, and up to four eggs may be laid on a single leaf. The egg is typical of the genus, and the first instar is brownish grey, later brown, with a brown head. The second instar is matt brown with paler developing scoli, and remains similar in form up to and throughout the fourth instar. Müller (1886) also reared this species in Santa Catharina, but reported that the early instars were green. The last instar is greenish with a brown dorsal mark near the centre of the body (Müller (1886) reports black dorsal colouring on segments T1-A2, and A8 and sometimes A7, similar to *A. plesaure* and *A. viola viola*), and has pairs of brownish, fleshy, spined tubercles on segments T2, T3 and A2, the first pair inclined anteriorly, the second vertical, and the third inclined posteriorly. There are similar but smaller pairs of scoli on A7 and A8, while segments A3-A6 only have very small scoli. The prepupa is pale brownish. The pupa is light brown with a gold gloss, most pronounced on the thoracic segments, and differing in form from *A. serpa*. The abdominal segments are laterally compressed, with the wing edges protruding. There is a flat, dorsal keel which is composed of the projections on T2 and A2, and these appear to almost meet in the middle, similar to *A. melona*. The remaining abdominal segments each have a pronounced dorsal keel, ending sharply at the end of each segment. The head ends in two flat horns, which are dorso-ventrally compressed. The spiracles are dark-brown. The "first abdominal segments" have small projections in the same position as the last instar scoli. Hoffmann also stated that the pupa "rests" 31-35 days during the winter, possibly indicating diapause, and that the adults eclosed in July. Hayward (1931) also reared this species in Argentina and states that the larva is dark green and covered with protuberances with terminal spines, changing to a yellowish brown, presumably prior to pupation, in the last instar.

The development time was listed by Hoffmann (1937a) as follows: egg, 5 days; 1st instar, 10 days; 2nd-4th instar, 10-13 days (oviposition-moult of last instar, 48 days); 5th instar, 10 days; pupa, 31-35 days. Hoffman speculated that this protracted development time, 89-94 days, was due to the low temperatures in June and July, when his rearing records took place. Certainly this time is much greater than other reported *Adelpha*, the next longest being *A. bredowii californica*, at 65 days (Comstock & Dammers, 1932).

The early instar larval behaviour of extending the leaf midrib with frass fastened with silk is typical of the genus, while the fifth instar abandons these perches and rests on top of the leaf. The larva appears to rest in the Front-Arched-Rear-Up Position of Aiello (1984), with the head pressed to the leaf. Hoffmann also reported parasitisation of larvae by an unidentified Hymenoptera ("wasp").

Habitat and adult ecology: This is one of the most common species throughout its range, and its phenotypic stability suggests it may well be a model species in mimicry rings from this region. It flies throughout the year, and although there is a single record of 2100m, this requires confirmation since all other records are from 200m to 1400m. Ebert (1969) found it to be common in Minas Gerais in a variety of habitats, from primary to secondary forest, along rivers and in hilly areas. Brown (1992) reports it to be common in disturbed forest areas in the Serra do Japi, São Paulo, Brazil. Hoffmann (1936) reported that the species could often be found feeding at flowers of *Mikania* in Santa Catharina, Brazil.

Specimens examined: 367 (289♂, 78♀)
BRAZIL (269♂, 74♀): "*Amazonas*": Canuma Apr. 1♂ AMNH-error; *Bahia*: Bahia 1♂ BMNH; *Distrito Federal*: Brasília 1♂ ZMHU, 2♂ USNM; *Espírito Santo*: Baixo Guandú Dec. 2♂, 1♀ AME; Santa Teresa Oct. 1♂ MUSM; no specific locality Oct. 1♀ BMB, 1♂ AMNH; *Minas Gerais*: Campo Belo 1♂ BMNH; Itamonte, 15 km S.E., Feb. 1♀ USNM; Mariana 14♂ AME; Nova

Lima Apr. Aug. 1♂ USNM, 1♂ AME; Ouro Prêto Apr. 1♂ BMNH; Passa Quatro 1000m 2♀ BMNH, 1♂ MNHN; Rio-Belo, km 290, May 1♂ USNM; Serra do Espinhaço Apr. 3♂ AME; no specific locality 2100m Feb.-Apr. Aug. 17♂ BMNH, 1♀ MNHN; "*Pará*": Óbidos 1♂, 1♀ AME-error; *Paraná*: Castro 2900' Jan. Mar. Apr. 3♂, 2♀ BMNH, 1♂ AME, 1♂, 1♀ USNM; Caviúna 2♀ AMNH; Curitiba Mar. 1♂ FSCA, 2♀ MNHN; Fernández Pinheiro 2600' Apr. 2♂ AME; Gurrahaia Apr. 1♂ AME; Iguaçu Oct. 2♂ BMNH; Ponta Grossa 3500' May Dec. 3♂ AME, 3♂ BMB; São Luiz do Puruna 900m Mar. 1♂ FSCA; Tibagy 2400' Mar. 1♂ AME; Tijucas do Sul 850m Apr. 1♀ MUSM; União da Vitória 2000' Dec. Jan. Mar. 6♂, 2♀ BMB, 1♂ MUSM; *Rio de Janeiro*: Itabapoana 1♂ BMNH; Laguna de Sacuarema 2♂ BMNH; Nova Friborgo 3000' Jan. 1♀ BMNH, 1♂ AMNH, 2♂ AME, 8♂ USNM, 6♂ BMB, 1♂ MNHN; Petrópolis Mar. Nov. 10♂, 4♀ BMNH; Rio 5♂, 2♀ BMNH; Teresópolis 3♂, 1♀ BMNH; *Rio Grande do Norte*: Natal 1♀ MNHN; *Rio Grande do Sul*: Northeast 1♀ BMNH; Pelotas Jan.-Apr. Jun. Dec. 47♂, 8♀ AMNH, 6♂, 6♀ MCZ, 1♀ BMNH, 2♂ MUSM, 1♀ AME, 8♂, 4♀ USNM; Rio Grande do Sul May Jun. 2♂, 4♀ BMNH, 1♂, 1♀ ZMHU, 2♂, 1♀ AME, 3♂ MNHN; Santa Cruz 1♂ AME; *Santa Catharina*: Rio Natal, nr. Rio Vermelho 900-1450' Mar. 1♂ FSCA; Blumenau 24♂, 4♀ MCZ, 1♀ BMNH, 2♂ ZMHU; Cauna Mar. Apr. 2♂, 1♀ AMNH; Joinville 1♀ AMNH; Pinhal Apr. 1♂ USNM; Rio Negro 1♂ MNHN; Rio Vermelho 3350-3550' Mar. 1♂ FSCA; São Bento do Sul 850m Feb. Mar. 6♂, 1♀ AME; Trombudo Alto Jan. 2♂ AME; Villa de Lages 2♂ BMNH; no specific locality 5♂, 3♀ AMNH, 4♂ MCZ, 1♀ ZMHU; *São Paulo*: Alto da Serra Santos 2600' Feb. Apr. 1♂ BMNH, 2♂ AME, 1♀ MCZ; Bahuru 7♂ BMNH; Itaquaquetetuba Jun. 1♂ BMB; Jacarei Jaguari May 2♂ AME; São Paulo 2500' Nov. Dec. Feb. Apr. 3♂, 2♀ BMNH, 1♂, 1♀ ZMHU, 1♂ USNM, 3♂, 2♀ BMB, 1♂ MCZ; Villa Mathias, Santos Nov. 1♂ MNHN; *Not located*: Rio River 1♀ BMNH; S. Brazil 1♀ BMNH; no specific locality 4♂ BMNH, 1♂ BMB, 3♂ MNHN, 3♂, 1♀ AMNH. **ARGENTINA** (1♂): *Misiones*: San Ignacio May 1♂ USNM. **PARAGUAY** (9♂): *Caaguazu*: Yhú Sep.-Dec. 2♂ BMNH; *Central*: Trinidad Jul.-Sep. 1♂ AMNH; *Paraguarí*: Sapucay Jan. Sep. Nov. Dec. 3♂ BMNH, 1♂ BMB; *Not located*: S. Paraguay 2♂ BMNH. **URUGUAY** (1♂, 2♀): *Montevideo*: Montevideo Nov. 1♂, 2♀ AMNH. **COUNTRY UNKNOWN** (9♂, 2♀): no specific locality 1♂, 1♀ BMNH, 1♂ AME, 5♂, 1♀ MNHN, 2♂ MCZ.

Additional locality data: **BRAZIL**: *Minas Gerais*: Poços de Caldas 1000-1400m Jan.-May Nov. Dec. (Ebert, 1969); *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *Rio Grande do Sul*: Cascata; Monte Bonito Mar. Apr. May (Biezanko, 1949); *Santa Catharina*: Rio Negrucho 850m (Hoffmann, 1936); *São Paulo*: Mata de Santa Genebra, nr. Campinas (Ecoforça, 2000); Serra do Japi (Brown, 1992).

Adelpha cytherea (Linnaeus, 1758)

Figs. **67**; 120; 158; 241; *297*

Identification, taxonomy and variation:

This species is distinguished from all similar species by having the orange postdiscal series on the DFW fused with the white postdiscal band anterior of vein M_3 at least, usually to vein Cu_2, forming an even band to the costa. The presence of the third discal cell bar on the VFW helps to distinguish it from species that may be superficially similar, such as *A. cocala*, *A. mythra* and *A. plesaure*. The male genitalia are distinctive in having a high dorsal medial lobe on the valva, positioned very close to the dorsal basal lobe, and a short clunicula. There is considerable variation in the width of the white DHW postdiscal band, the presence or absence of orange along the postdiscal series on the DHW, and the extent of orange on the DFW in cell 2A-Cu_2, particularly along the inner postdiscal series, which immediately borders the distal edge of the white postdiscal band. I recognise seven subspecies, several of which may prove, when additional material becomes available, to only represent clinal variation.

The relationships of this species are somewhat obscure, but there is some evidence to suggest that it may be relatively closely related to *A. salmoneus* and *A. viola*. All of these species share similar male and female genitalia and the presence of a third discal cell bar on the VFW. The latter character is found in the most primitive members of the genus, but its presence in these three species may represent a reversal and therefore a synapomorphy. In addition, the larval hostplants and early stages of all three species are similar.

Range and status: Mexico to western Ecuador and northwestern Venezuela, to Bolivia, Brazil, northeastern Argentina, the Guianas and Trinidad. In secondary growth habitats from sea level to 1500m, very common.

Specimens examined: 1689 (1256♂, 433♀)

Adelpha cytherea cytherea (Linnaeus, 1758)

Figs. **67a,b**; *297*

Papilio cytherea Linnaeus (1758: 481, n. 139)

TL: "Indiis"-erroneous. **Types**: **Linnaean coll.**: **ST**♂: [photograph examined]

=*Papilio eleus* Linnaeus (1758: 486, n. 176) **stat. rest.**

TL: "Indiis"-erroneous. **Types**: **Coll. unknown**: **ST**: [not located]

=*Adelpha lanilla* Fruhstorfer (1913: 108b; 1915: 521)

TL: [Peru; Bolivia; Mato Grosso (Brazil)]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//cytherea lanilla Fruhst.//Yungas Bolivia//TYPE//Type//Syntype"; **ST**♀: "Peru H. Fruhstorfer//TYPE//Type"; **BMNH**(M): **ST**♂: Peru H. Fruhstorfer//cytherea lanilla Fruhst.//Fruhstorfer Coll. B.M. 1937-285"; 2**ST**?♂: Mato Grosso//Fruhstorfer Coll. B.M. 1937-285"; **BMNH**(R): **ST**♂: "cytherea lanilla Fruhst.//Pozuzo Huánuco 800-1000m (W. Hoffmanns)//R" [all examined]

Papilio cytherea Linn., Linnaeus (1764: 305, n. 123), Clerck (1764: tab. 39 [fig. 3, numbered in register at back]); *Papilio eleus* Linn., Linnaeus (1764: 312, n. 130), Herbst (1793: 133, pl. 147, fig. 3, 4); *Papilio elaea* [sic] Linn., Müller (1774: 613, pl. 19, fig. 10); *Papilio elea* [sic] Cramer (1779: 83, pl. 242, fig. D, E); *Najas cytherea* Linn., Hübner (1808: pl. 62, fig. 1, 2, 3, 4); *Adelpha elea* [sic] Linn., Hübner ([1819]); *Adelpha cytherea* Linn., Hübner ([1819]); *Nymphalis cytherea* Linn., Godart ([1824]: 373); *Heterochroa cytherea* Linn., Westwood (1850); *Adelpha cytherea* Linn., Kirby (1871); *Adelpha cytherea* Linn., Aurivillius (1882)

Misapplication of names:

Papilio cythereus [sic] Linn., Herbst (1793: 137, pl. 148, fig. 1, 2) = *Adelpha iphiclus iphiclus*; *Papilio cytherea* Linn., Müller (1774: 619, pl. 19, fig. 6) = *Speyeria idalia* (Drury); *Papilio cytherea* Linn., Cramer (1781: 170, pl. 376, fig. C, D) = *Adelpha thoasa calliphiclea*

Identification, taxonomy and variation:

The nominate subspecies is distinguished from others by the outer postdiscal series on the DFW extending to the anal margin as an orange line, but the inner series terminating at vein Cu_2, so that the white postdiscal band is separated from the orange dash of the outer postdiscal series by a dark brown area in cell 2A-Cu_2. *Adelpha c. marcia* also has a similar arrangement in cell 2A-Cu_2 on the DFW, and although sometimes indistinguishable, it typically has a narrower orange DFW band. I retain the two as distinct since they are clearly disjunct in range. *Adelpha c. aea* typically has no orange in cell 2A-Cu_2 on the DFW, and the white extends to vein Cu_1. Both *A. c. daguana* and *A. c. insularis* have the inner postdiscal series on the DFW orange in cell 2A-Cu_2, while the latter also has orange scaling lining veins Cu_2-M_2 in the postdiscal area of the DHW. The nominate subspecies is rather variable both individually and geographically, but I do not regard any of the observed differences as sufficiently stable to warrant separate subspecific recognition. Specimens from the lower Amazon and the Guianas often have a scalloped distal edge to the DFW orange band, and some have bright orange band in the DFW discal cell between the second and fourth discal cell bars (the latter also occurs in specimens from the Orinoco delta (Neild, 1996)). The white hindwing band tends to thin clinally from west to east across the Amazon basin, especially in females, with specimens from Santarem and Maranhão having very thin white bands. Specimens from Pernambuco have the orange on the DFW extending to the white band in cell 2A-Cu_2, while a single male from Quipapa (Pernambuco) and one from Tombador Falls (Mato Grosso), have the white band extended along the inside edge of the orange as far as vein M_3. I have seen insufficient specimens from Pernambuco to determine whether any of the variation there represents a distinct subspecies and treat those specimens here as the nominate subspecies.

This is another species which has suffered a varied taxonomic history, again due to a poor original description by Linnaeus. Linnaeus' (1758: 481) description of *Papilio cytherea* is as follows (words and translation in square brackets added by me): "*P.* [Papilio] *N.* [Nymphales] *alis crenatis flavis fascia communi argentea: subtus fascia lanceolata argentea. Alae supra cinereo nebulosae: primores disco flavo.*" ["P. N. with scalloped yellow wings, common silver band: silver lance-shaped band beneath. Wings above dark ashy grey: forewings with yellow disc."]. Clerck (1764: tab. 39) then figured both surfaces of a specimen under this name which clearly belongs to *A. cytherea* as treated here (from now on referred to as *A. cytherea*), except that he omitted the orange tornal spot on the DHW. Several pages later, and shortly after his description of *Papilio iphiclus*, Linnaeus (1758: 486) described *Papilio eleus* as follows: "*P.* [Papilio] *B.* [Barbarus] *alis dentatis fusco-nebulosis concolouribus: fascia primoribus flava, positicis alba.*" ["P. B. with dentate wings, uniformly dark brownish: yellow band on forewings, white on hindwings."]. This species was not, however, figured by Clerck, but Linnaeus (1764) embellished this somewhat curt original description as follows: "*Alae primores supra basi margineque exteriore fusco nebulosae. Fascia disci lata, flava. Posticae supra flava-nebulosae. Fascia alba, transversa, angusta, quae etiam tangit anteriorum. Subtus omnes flavescentes margine albo undulato. Fascia alba fenestrata f. perspicua*" ["Forewings above, base and exterior margin dark brown. Wide yellow band at disc. Hindwings above dark yellowish. White, narrow, transverse band, which also touches the former. Beneath yellowish with undulate white margin. White fenestrated band f. perspicua(?)"]. This latter description corresponds well with *A. cytherea* as treated here, and it is thus not surprising that Müller (1774), Cramer (1779) and Herbst (1793) all figured typical *A. cytherea* under various spellings of the name *Papilio eleus*. The same authors, however, figured as *Papilio cytherea* the North American species *Speyeria idalia* (Drury) (see Müller, 1774), *Adelpha thoasa calliphiclea* (see Cramer, 1781) and *Adelpha iphiclus* (see Herbst, 1793), clearly being unable to recognise Linnaeus' description as applying to *A. cytherea*.

Hübner ([1819]) listed both names in his new genus *Adelpha*, referring to an earlier figure of his (Hübner, 1808) as representing *A. cytherea*, and indeed that figure is an accurate depiction of the species and was selected as the typical figure by Aurivillius (1882). Shortly after, Godart ([1824]) suggested for the first time that Linnaeus' *Papilio eleus* and *Papilio cytherea* were in fact one and the same species, *eleus* merely representing the female, and synonymised *eleus* with *cytherea*. Both Westwood (1850) and Kirby (1871) followed the same course, but Aurivillius (1882) stated that he did not believe Godart's theory, and instead regarded *eleus* as applying to a species such as *A. erotia* or *A. cocala*. Since there is no known type of *Papilio eleus*, and the description is so brief, Aurivillius (1882) decided to reject the name *eleus* on the grounds that it could not be determined to which taxon it referred. I agree with Aurivillius that it is very hard to believe that *eleus* and *cytherea* simply represent different sexes, the sexes being externally almost indistinguishable in *A. cytherea*, but I disagree that *eleus* refers to a species other than *A. cytherea*. Instead, I believe it possible that Linnaeus' *Papilio cytherea* was not based on a specimen of *A. cytherea* as currently regarded, the only evidence of which is Clerck's figure and the specimen which he figured, the putative syntype, which lacks any labels and is in the Linnaean collection in London. Linnaeus (1758) described *cytherea* in the midst of a number of species now in the nymphaline subtribe Melitaeina, in a different "phalanx" (Barbarus as opposed to Nymphales) to both *eleus* and *iphiclus*, and he later (Linnaeus, 1764: 305) stated that the body size of *cytherea* was equal to that of the European species *Aglais urticae*, while that of both *eleus* and *iphiclus* was only a third the size. However, given the brevity of the description, there is no way to determine to what species Linnaeus was really referring as *Papilio cytherea*, and it is true that the description, with some allowance for artistic interpretation, could also be regarded as referring to true *A. cytherea*. Linnaeus (1764) also refers to Clerck's figure as representing his *Papilio cytherea*, and since all authors subsequent to Hübner (1808) have treated *A. cytherea* under that name, I adopt the theory of Martin Honey (pers. comm.) at the BMNH, who has made a thorough study of the Linnaean butterfly names, that Linnaeus was simply careless and described the same species twice. The outcome is clearly desirable in terms of nomenclatural stability, and since Aurivillius (1882) resurrected the name *eleus* from synonymy with *cytherea*, I return it once more (**stat. rest.**).

The type of *A. cytherea* probably came from the Guianas, but as I can find no consistent differences between specimens from there and any other localities in the Amazon basin, I follow Hayward (1951) in regarding the name *lanilla*, figured (Fruhstorfer, 1913) and later described as a subspecies of *A. cytherea* by Fruhstorfer (1915) based on specimens from Peru, Bolivia, and Mato Grosso, as a synonym of *A. c. cytherea* .

Range: Venezuela, in forested areas east and south of the llanos, to Bolivia, throughout the Amazon basin, east to the coast of Brazil in Pernambuco and in the Guianas. Occasional specimens phenotypically the same as this subspecies occur in Rio de Janeiro, within the range of *A. c. aea* (see discussion under that subspecies), while Hayward (1931, 1951) figures a sketch of this subspecies based on an Argentinian specimen.

Immature stages: Moss (1933) reared this taxon in Brazil (Pará) and reports that early instars are brown, later instars are in two shades of brown, and figures the last instar in colour (Pl. I, fig. 2). The figure shows darker lateral stripes on the abdominal segments. Scoli are most developed on T2, T3, A2, A7 and A8, where they have lateral spines, while remaining scoli are short reduced lateral spines. The head capsule has chalazae a3 and a4 very reduced, a1 and a2 are small, and the remainder are long and thin. Lateral and ventral views of the pupa were figured (pl. II, fig. 1); the projections on T2 and A2 are relatively short, and the head horns are short and triangular. Early instars rest on the extended midrib, later instars rest in the Front-Curved position (as figured) and the Front-Arched-Rear-Up position (Aiello, 1984).

Habitat and adult ecology: This is the most common species of *Adelpha*, and it is widespread and abundant in most secondary growth habitats from sea level to 1200m, where it flies throughout the year. The hostplant grows along roadsides and open forest paths (Moss, 1933), and these areas, in addition to river sides and forest edges, are frequented by this species in numbers. Males may be attracted to traps baited with rotting fish or banana, and also perch on low bushes less than a metre high from 8.30am-5pm in secondary growth areas and small fields, where they flit from one bush to the next with a gliding flight, with few wing beats. Experiments to date indicate that this species is palatable to both jacamars

(Srygley & Chai, 1990) and kingbirds (Pinheiro, 1996). One male in the USNM was apparently caught at a blacklight.

Specimens examined (461♂, 198♀): † - trans. to *A. c. aea*; ‡ - trans. to *A. c. olbia*; * - DFW white extends to vein M_3, orange extends to white in cell 2A-Cu_2; # - as previous, except white to vein Cu_1, trans. to *A. c. insularis*; **?** – identification uncertain, could also be *A. c. marcia*.
VENEZUELA (26♂, 7♀): *Amazonas*: San Carlos Mar. 1♂ USNM; San Carlos de Río Negro-Solano 100m Mar. 1♂ AFEN; *Bolívar*: El Dorado, 500' Jun. 1♂ FSCA; Jabillal, L. Caura River 100m Aug. 1♂ BMNH, 1♂ AFEN; Kavanayén rd., km 10, 900m Aug. 1♂ AFEN; La Vuelta, Caura R. 1♂ BMNH; Reserva Forestal Imataca 200m Dec. 1♂ MUSM; Suapure Mar. 3♂ BMNH, 2♂ MCZ; *Delta Amacuro*: Caño Guayo Jan. 2♂ MUSM; Río Acure 2♂#, 2♀# AME; *Monagas*: Barrancas 1♂# AME; Caripito 4♂, 2♀ AMNH; La Pica Oct. 1♀ MUSM; *Sucre*: Santa Fé, S.W. of Cumaná 60m Nov. 1♂, 1♀ AFEN; *Not located*: Alto Orinoco Nov. 1♂ USNM; no specific locality 1♂ BMNH, 1♀ MNHN, 1♂ AMNH. **COLOMBIA** (32♂, 11♀): *Amazonas*: La Pedrera, Río Caquetá 170m Dec. 1♂ MHNUC; El Tacana 150m Dec. 1♂ MNHUC; Río Tacana Nov. 2♂, 3♀ AMNH; Florida May 2♂ BMNH; Leticia Apr. May 1♂, 3♀ AMNH, 5♂ USNM, 1♂ ESM; lower Río Putumayo Oct. 1♂ AMNH; Puerto Leguizamo Apr. 1♂ ESM; "*Boyacá*": Muzo 5♂, 3♀ AME-error; *Caquetá*: Florencia 1300' Jan. 1♂ USNM; Río Bodoquero Jan. 1♂, 1♀ USNM; Río Orteguaza Aug. 1♂ AMNH; Vereda San Jorge, Moravia Jan. 1♂ MHNUC; *Meta*: Villavicencio Jun. 500m (Robbins 14/6/72) 1♂ USNM; *Vaupés*: Mitú Jun. 3♂ USNM; Río Vaupés 3♂‡ BMNH; *Not located*: Santa Catharina 1♂, 1♀ MNHN. **ECUADOR** (57♂, 18♀): *Morona-Santiago*: Bomboiza Nov. 1♂ DAT; Méndez Oct. 1♂ MJP; Méndez-Santiago rd., km 40, Oct. Nov. 1♂ MJP, 1♂ DAT; Santiago Sep. 1♂ KWJH; *Napo*: Coca May-Jul. 1♂ BMNH; Cord. Galeras 850m Apr. 2♂, 1♀ MJP; Cotundo Jul. 3♂ USNM; Misahuallí Mar. Jul. 1♂ KWJH, 1♂ MUSM; Pimpilala 600m Oct. 1♂ KWJH; Río Coca Jun. 3♂, 5♀ AME; Río Jondachi 1000m Nov. 1♂, 2♀ USNM; Río Tiputini Apr. 1♂, 1♀ MJP; San Rafael 1♂ USNM; Satzayacu Sep. Nov. 1♂, 1♀ DAT, 1♂ AME; Via Venezia 550m Feb. 1♀ AME; *Pastaza*: Canelos Jun. 1♂ DAT, 1♂ MCZ, 1♂ AMNH; Puyo-Tena rd., km 9, Oct. 2♂ MJP; Puyo-Tena rd., km 25, 1♀ USNM; Puyo May Jun. Nov. Dec. 1♂, 1♀ AMNH, 1♂ USNM, 1♂ FSCA, 1♂(blacklight P.J. Spangler & D.R. Givens) USNM; Zulaya Dec. 1♂ AMNH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Feb. Nov. 2♂(1‡), 1♀‡ PJD; *Tungurahua*: Río Tigre 1200m Aug. 1♂ AME; Topo Mar. Sep. Nov. Dec. 3♂ USNM, 1♂, 1♀ AME; *Zamora-Chinchipe*: Cumbaratza Jun. 1♂ USNM; Río Numbala 1♂ BMNH; Zamora 7♂, 1♀ BMNH; *Not located*: middle Ecuador 1♂ AMNH; Río Pescado 3♂ AMNH; no specific locality 3♂, 1♀ AMNH, 1♂ BMNH, 1♂ MNHN. **PERU** (108♂, 28♀): *Amazonas*: Falso Paquisha 800m Oct. 1♀ MUSM; *Cajamarca*: Charape 1200m Nov. 1♂ MUSM; *Cuzco*: "Cuzco" 1♂ MNHN-error; Pilcopata 750m Feb. 1♂ MUSM; Quebrada Quitacalzón, Cosñipata 1050m May 1♀ MUSM; *Huánuco*: Palcazu 1♂ BMNH; Tingo María Feb. Mar. May Jun. Aug. Nov. 4♂, 1♀ FSCA, 6♂, 3♀ AME, 3♂ MUSM, 1♂ USNM, 1♂ AMNH; Tournavista 2♂ AME; *Junín*: Río Perené Mar. 3♂ MNHN, 1♂ BMNH, 1♂ MUSM; Satipo 1♂ AMNH; Satipo, 25 km N., 800m May 1♂ MUSM; *Loreto*: Arcadia 150m Oct. 1♂ MUSM; Castaña 150m Oct. 1♂, 2♀ MUSM; Curaray 1♂ MNHN; Iquitos Feb.-Apr. Jun. Aug. 10♂, 6♀ AMNH, 8♂ BMNH, 1♂ ZMHU, 3♂ FSCA, 3♀ AME; Pebas 3♂ BMNH, 1♀ ZMHU; Puerto Almendras 120m Sep. 1♂ MUSM; "Río Negro" [=Río Huallaga] 1♂ BMNH; Río Sucusari 140m Sep. 3♂, 5♀ MUSM; Yanamono Jul. 2♂ MUSM; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Boca Río La Torre Jun. Jul. 300m 2♂ MUSM; Pakitza 400m Nov. 1♂ MUSM; Puerto Maldonado 250m Aug. 3♂ AME; Puerto Maldonado, 15 km E., 200m Nov. 1♂ MUSM; Alto Río Madre de Dios 420m Jul. 1♀ AME; *Pasco*: Chuchurras 2♂ MUSM; Oxapampa 1♀ MUSM; Pozuzo 4♂ BMNH; Villa America-Santos Ortiz Oct. 1♂ MUSM; *Puno*: Chaquimayo Apr. 1♂, 1♀ BMNH, 1♂ AMNH; La Unión 2000' Nov. 3♂ BMNH; Río Távara Aug. 1050m 1♂ MUSM; Yahuarmayo Apr.-Jul. 3♂ BMNH; *San Martín*: Jepelacio 2♂ AMNH; Pongo del Cainarache Aug. 2♀ MUSM; Tarapoto 400m Sep. 1♂ MUSM; *Ucayali*: Boquerón Abad Mar. 1♂ AME; *Not located*: Huallaga 1♂ AMNH; Ucayali 1♂ BMNH; upper Río Marañón Jan. Sep. Dec. 6♂ AMNH; no specific locality 7♂, 1♀ BMNH, 1♂ BMB, 1♂ USNM. **BOLIVIA** (5♂, 1♀): *La Paz*: Río Songo 1♂ ZMHU; Yungas 1♂ BMNH; *Santa Cruz*: Río Juntas 1000m 1♂ ZMHU; *Not located*: no specific locality 1♂, 1♀ MCZ, 1♂ BMNH. **BRAZIL** (122♂, 59♀): *Amazonas*: Benjamin Constant 1♂ AMNH; Fonte Boa 2♂ BMNH; Humaitá Jul.-Sep. 2♂ BMNH; lower Rio Madeira 2♂ BMNH; Madeira 1♂ BMNH; Manicoré Jun. 1♂ ZMHU, 2♀ AME; Maués 1♂ ZMHU; Puraquequara Apr. 1♀ AMNH; Rio Caiari-Uaupés Nov. 3♂, 1♀ AMNH; Rio Negro 1♀ AMNH; San Juan, Solimões 1♂ BMNH; São Paulo de Olivença Aug. 2♂ BMNH, 1♀ AMNH, 1♂ ZMHU; Serpa Jan.-Mar. 3♂, 1♀ BMB; Tefé Jun. 1♂, 1♀ MCZ, 3♂ BMNH; Thamar, Rio Negro 1♂ ZMHU; *Bahia*: Bahia 3♂ BMNH; *Maranhão*: "Maranham" 2♂, 2♀ BMNH; Maranhão May 2♂, 3♀ BMNH; Mts. Aureos 1♀ BMNH; *Mato Grosso*: Chapada 1♂ BMNH; Cuiabá 1000' May 1♀ BMNH; Tombador Falls 2000' Aug. 1♂* BMNH; no specific locality 2♂ BMNH; *Minas Gerais*: San Jacinto Apr. 2♂ BMNH; Tijuco 2♂ BMNH; no specific locality 2100m 1♂ BMNH, 1♂ MNHN; *Pará*: Belém 1♀ AME; Cuiabá-Santarém, km 958, 1♂† AME; Cuiabá-Santarém, km 1164, 1♂ AME, 3♂, 1♀ AMNH; Juruty 3♂, 1♀ BMNH, 1♀ ZMHU; Mosqueiro, Rio de Pará Mar. 1♂ BMNH; Óbidos Jun. Sep. 6♂, 1♀ BMNH, 3♂, 2♀ AMNH, 1♂ USNM, 1♂ ZMHU; Pará Aug. 23♂, 14♀ BMNH, 4♂ BMB, 1♂, 2♀ AMNH, 1♂, 1♀ MCZ; Rio Tapajós 1♀ AMNH; Santarém Nov. 4♂, 4♀ BMNH, 1♀ AME; *Pernambuco*: Pernambuco 6♂, 1♀ BMNH, 1♀ MCZ; Quipapá 1♂* BMNH; Recife Sep. 1♀ MCZ; Tirua Jul. 1♀ MCZ; *Rio de Janeiro*: Casmirode Abieu Jan. 1♀† USNM; Petrópolis 2♂ BMNH; Rio de Janeiro 3♂(1†) BMNH, 1♂, 2♀ MNHN; Tijuca 1♀ USNM; *Rondônia*: Cacaulândia Mar. Oct. Nov. Dec. 2♂, 1♀ FSCA, 2♂, 1♀ USNM; Porto Velho Feb.-Mar. 3♂ BMNH; *Not located*: no specific locality 6♂, 1♀ BMNH, 1♂, 2♀ AMNH, 3♂ MNHN, 1♀ USNM. **GUYANA** (40♂, 33♀): *Barima/Waini*: Mabaruma Dec. Jan. 1♂ BMB; *Cuyuni/Mazaruni*: Bartica Mar. Apr. Dec. 1♂, 1♀ BMNH, 1♂, 2♀ AMNH, 1♂ AME, 2♂, 1♀ BMB; Kamakusa 1♂ AMNH; Kartabo 6♂, 7♀ AMNH; Roraima 1♂ BMNH; *Demerara/Mahaica*: Georgetown 1♂ BMNH; *Essequibo Is./West Demerara*: Parika Dec. 1♂, 1♀ BMB; *Pomeroon/Supenaam*: Dawa, Pomeroon Mar. 1♀ AME; *Potaro/Siparuni*: Kaietur Falls Feb. Mar. 4♀ BMB; Kangaruma 1♀ AMNH; Potaro River Mar. Jul. 2♂ BMNH, 1♂, 4♀ AME; Tumatumari Aug. 1♂, 1♀ AMNH, 1♂, 1♀ AME; *Upper Demerara/Berbice*: Berbice 1♀ BMNH; Omai 2♂, 2♀ BMNH; Wismar 1♀ AMNH; *Not located*: Demerara 1♂ BMNH, 1♀ BMB; Essequibo River 1♂ AMNH; Essequibo R. 140 mi. inland 2♂ BMNH; Río Demerara 7♂ BMNH; no specific locality 5♂, 2♀ BMNH, 1♂, 2♀ AMNH. **FRENCH GUIANA** (48♂, 28♀): *Cayenne*: Cacao 500' Jan. Mar. 2♂, 1♀ FSCA; Cayenne Jan. Oct. 7♂ BMNH, 1♂, 1♀ USNM, 1♂ ZMHU, 1♂ FSCA, 1♂ BMB; Kaw Apr. 3♂ AMNH; Matoury Oct. Nov. 2♂, 1♀ USNM; Roura-Kaw rd. Sep. 1♀ AMNH; Route N1 6, 1♂ AMNH; St. Georges Jun. 1♀ MUSM; *Laurent du Maroni*: Maroni River 14♂, 7♀ AME; Nouveau Chantier Jun. 1♂, 1♀ BMNH; St. Jean du Maroni 2♀ BMNH, 2♂ USNM, 1♀ BMB; St. Laurent du Maroni Dec. 2♂, 1♀ BMNH, 1♂ USNM; Saül Nov. 1♀ MUSM, 1♀ USNM; *Not located*: Placer Trésor Jun. 1♂, 1♀ FSCA; no specific locality 3♂, 5♀ BMNH, 5♂, 3♀ MNHN. **SURINAM** (7♂, 2♀): *Marowijne*: Albina Jan. 2♂ BMNH; Aroewarwa Creek, Maroewym Valley Feb. Jun. 1♂, 1♀ BMNH; *Brokopondo*: Berg-en-Dal Mar. 1♂ BMNH; *Para*: Bersaba 1♀ ZMHU; *Not located*: no specific locality 3♂ BMNH. **COUNTRY UNKNOWN** (14♂, 10♀): Amazon 2♂ BMNH, 2♂ MCZ; Bura Bura 1♀**?** MCZ; no specific locality 2♂, 7♀ BMNH, 1♂ ZMHU, 1♀ AME, 4♂ MNHN, 2♂, 1♀ MCZ, 1♂ AMNH.
Additional locality data: **ECUADOR**: *Morona-Santiago*: Bomboiza May Jul.; Río Miriumi Oct.; Taisha Jun.; *Napo*: Apuya Feb. Apr. May Aug.-Oct.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Jul. Sep.; Finca San Carlo Feb. Aug. Sep.; Pano Apr.; Pimpilala Apr. Aug. Sep.; Río Achiyacu Jul.; Río Jatunyacu Jul.; Río Tiputini Jun.; Tiputini Biodiversity Station 300m Aug.; Yasuní Jul. Aug.; *Pastaza*: Lorocachi Jul.; Pitirishca Jul.; Puyo-Canelos rd., km 30, Oct.; Río Llandia Aug.; Shell Feb.; *Zamora-Chinchipe*: Chachacoma Nov.; Quebrada Chorillos Apr.; Zumba-Loja rd., km 35, Jul. (Willmott & Hall, sight records). **BRAZIL**: *Amazonas*: Ilha de Maracá (Mielke & Casagrande, [1992]). **ARGENTINA**: *Misiones* (Hayward, 1931, 1951).

Adelpha cytherea marcia Fruhstorfer, 1913

Figs. **67c**; 120; *297*

Adelpha marcia Fruhstorfer (1913: 108b; 1915: 521)

TL: San Pedro Sula, Honduras. **OTL**: [Guatemala to Colombia]. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//cytherea marcia Fruhst.//Honduras San Pedro Sula ex coll. Fruhstorfer//TYPE//Type//Syntype"; **PLT**♀: "Honduras San Pedro Sula ex coll. Fruhstorfer//TYPE//Type"; **BMNH**(R): **PLT**♂: "Burica I., Col., 4 II. 02 (J.H. Batty)//cytherea marcia Fruhst.//R" trans. to *cytherea daguana* [all examined]

Adelpha cytherea marcia Fruhst., Fruhstorfer (1915); *Limenitis cytherea marcia* Fruhst., Ross (1964); *Adelpha cytherea marcia* Fruhst., DeVries (1986)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. c. daguana* by the inner postdiscal series on the DFW not being orange in cell 2A-Cu_2, in addition to having a generally thinner orange DFW band. The nominate subspecies is very similar, but disjunct, and typically has a broader orange DFW band. Both the DFW orange band and the DHW white band thin clinally through Central America from the southeast to the northwest.

Fruhstorfer (1913) figured this taxon, later placing it as a subspecies of *A. cytherea* and stating that his description was based on specimens from Guatemala to Colombia (Fruhstorfer, 1915). He distinguished it from the nominate by the narrower orange and white dorsal postdiscal bands. I have located two apparent syntypes in the BMNH, both of which are labelled as from Honduras, and a third from "Burica I., Col.". The latter locality is actually in Panama, and explains why Fruhstorfer erroneously listed Colombia in the range of this subspecies. Since this third specimen is transitional to *A. c. daguana*, and the first two syntypes closely resemble the original illustration and description, I designate the male specimen in the BMNH(T) as the lectotype of *Adelpha marcia*, with the following label data: "Fruhstorfer Coll. B.M. 1937-285//cytherea marcia Fruhst.//Honduras San Pedro Sula ex coll. Fruhstorfer//TYPE//Type//Syntype". Although the locality does not match the original description, I assume that this is due to later mislabelling or an error by Fruhstorfer in the original description.

Range: Mexico, in the state of Oaxaca, to the Costa Rica-Panamanian border, with intergrades to *A. c. daguana* in both extreme eastern Costa Rica and extreme western Panama.

Immature stages: According to DeVries' (1986, 1987) observations in Costa Rica, the egg is white and deposited singly, up to several times per plant. The mature larva is dark brown, the head capsule darker brown and the entire body covered with short setae. The pupa (Fig. 120) is apparently similar to that of *A. boreas*.

DeVries (1986) states that the larvae are solitary and rest on frass chains in all instars and feed on new, then old leaves of plants along river and forest edges and light gaps, in bright sun. However, it is only first to third instars which make frass chains, which they cover with dead leaf material, and later instars rest on damaged portions of leaves (DeVries, 1987). Jim Mallet (pers. comm.) reports that 9 chalcid wasp parasites hatched from a single pupa that he collected in Costa Rica.

Habitat and adult ecology: This subspecies is common throughout its range. It has been reported in Mexico from lowland rain forest between 100-500m, where it flies from April to October (de la Maza, 1987; de la Maza & de la Maza, 1993). DeVries (1987) states that it is widespread and common in Costa Rica from sea level to 900m on both slopes in all humid to wet forest habitats, particularly in areas of secondary growth where its hostplant is an early successional weed. Such areas include forest edges, beaches and large treefalls, where both sexes occur in association with the hostplant, frequently perching on the low tangles of *Sabicea*. Both sexes visit rotting fruits and flowers of *Cephaelis* and various Asteraceae. Although it occurs throughout the year, larvae are most abundant during the dry season.

Specimens examined (130♂, 46♀): †- trans. to *A. c. daguana*.
MEXICO (16♂, 3♀): *Chiapas*: Chajul 200m Jul. 1♂ KWJH; Pichucalco Jul. 1♂ AME; Río Lacantún 120m May 1♂ AME; no specific locality Sep. 2♂, 1♀ FSCA; *Guerrero*: no specific locality 1♂ BMNH; *Oaxaca*: Soyolapan el Bajo Oct. 2♂ AMNH; *Tabasco*: La Venta 10m 1♂, 1♀ AME; San Manvil 1♂ AME; Teapa Mar. 2♂ BMNH; *Veracruz*: Coatzacoalcos 1♂ AME; Presidio Jun. 1♂ AME; S. José del Carmen Apr. 1♀ FSCA; Tezonapa Jun. 1♂ AME, 1♂ AMNH. **GUATEMALA** (26♂, 8♀): *Alta Verapaz*: Cahabón 2♂ BMNH; Choctún 1♂ BMNH; Cubilguitz 1♂, 2♀ BMNH; Polochic Valley 2♂ BMNH; *Izabal*: Cayuga 1♂ USNM; Izabal 1♂ BMNH; Lívingston 1♂, 1♀ BMB; Puerto Barrios Dec. 7♂, 4♀ BMB; Quiriguá Feb. 1♂ USNM; Tenedores Jun. Jul. Sep. 4♂ AME, 2♂, 1♀ AMNH; *Not located*: no specific locality 2♂ BMNH, 1♂ USNM. **BELIZE** (19♂, 5♀): *Cayo*: Camp Sibún 200m Aug. 2♂ AME; *Stann Creek*: Stann Creek Jun. Aug. Sep. Nov. 4♂, 1♀ BMNH, 1♀ FSCA, 4♂ AME; *Toledo*: Blue Creek Jan. 1♂ AME; Punta Gorda Mar. Jun. Jul. 1♂, 1♀ BMNH, 1♂ FSCA, 1♀ AMNH; Río Grande 1♀ AMNH; *Not located*: no specific locality 6♂ BMNH. **HONDURAS** (11♂, 4♀): *Atlántida*: La Ceiba, 18 km W., Aug. 1♀ USNM; *Cortés*: San Pedro Sula 6♂, 3♀ BMNH; *Olancho*: Río Patuca Jul. 1♂ USNM; *Not located*: Petuc 3♂ AMNH; no specific locality 1♂ ZMHU. **NICARAGUA** (12♂, 10♀): *Chontales*: Chontales 2♂ BMNH; *Zelaya Sur*: Bluefields Dec. 3♂, 6♀ AMNH; rd. to Rama Jul. 1♂, 1♀ AME; Nueva Guinea Oct. 1♂ AME; *Zelaya Norte*: Jct. Río Waspuk & Río Wanks 300' Apr. 1♂ BMNH; San Ramón Mar. May-Jul. 3♂, 3♀ BMNH; *Managua*: Managua 1♂ AMNH. **COSTA RICA** (40♂, 16♀): *Cartago*: Irazú 6-7000' 1♀ BMNH; Juan Viñas 1♀ BMB; Pejevalle Mar. 1♀ USNM, 1♀ AME; Peralta 2000' Oct. 1♂ USNM; Tuis Jun. 1♂ USNM; Turrialba Jun. Jul. Sep. Nov. 3♂ AME, 1♂, 2♀ USNM; *Heredia*: Chilamate Mar. Aug. Dec. 7♂ FSCA, 2♀ AMNH, 1♂ AME; Finca La Selva 75m May Jun. Dec. 3♂ USNM; Puerto Viejo Mar. 1♂, 1♀ FSCA, 1♂ AME; *Limón*: Bribri Sep. 1♂ AME; Cahuita Mar. 1♂ FSCA; Guápiles Jan. Nov. 2♀ AMNH, 1♂ BMNH; Limón Sep. Oct. 5♂(3†) BMNH, 2♂, 1♀ USNM, 2♀ BMB; Petroleo Apr. 1♂ AME; Río Sixaola Apr. Sep. 1♂ BMNH, 1♂† USNM; Santa Clara Valley 1200' 1♂ BMNH; *Puntarenas*: Buenos Aires Sep. 1♂ AME; Osa Peninsula Jul. 1♀ AMNH; Palmar Norte Mar. 1♂ AME; *San José*: Carrillo Sep. Oct. 1♂ BMNH, 1♀ BMB; *Not located*: no specific locality 2♂ BMNH, 2♂ AMNH. "**BRAZIL**" (1♂): no specific locality 1♂ USNM-error. **COUNTRY UNKNOWN** (5♂): no specific locality 5♂ MCZ.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Selva Lacandona; Macizo Central (de la Maza & de la Maza, 1993); *Oaxaca*: Ayotzintepec; *Veracruz*: Playa Vicente (de la Maza, 1987); **BELIZE**: *Stann Creek*: S. of Melinda (Ross, 1964).

Adelpha cytherea insularis Fruhstorfer, 1913

Figs. **67d**; *297*

Adelpha insularis Fruhstorfer (1913: 108b; 1915: 521)

TL: [Trinidad]. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//118//cytherea insularis Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Trinidad//TYPE//Type//Syntype"; **BMNH**(R): **ST**♀: "TYPE//Trinidad//cytherea insularis Fruhst.//13//R" [both examined]

Adelpha cytherea Linn., Kaye (1904); *Adelpha cytherea insularis* Fruhst., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate in having the white in the DFW postdiscal band extend to vein Cu$_1$, while the inner postdiscal series in cell 2A-Cu$_2$ is orange. The DHW has veins Cu$_2$-M$_2$ lined with orange scales in the discal area, and the edge of the DFW distal margin is scalloped, as in Guianan specimens of *A. c. cytherea*.

Fruhstorfer (1913) figured and later described (Fruhstorfer, 1915: 521) this subspecies based on an unspecified number of specimens from Trinidad, and I have examined two syntypes in the BMNH (Fig. 67d). Barcant (1970: 154) heads his account of this taxon "*Adelpha cytherea insularis* (Sp. Nov.)", but I assume this is an error since he does not appear to have attempted to describe the name a second time, there being no mention at all of the specimens on which any description might have been based.

Range: This subspecies is confined to the island of Trinidad, with possible occasional strays to northeastern Venezuela, and Fruhstorfer's (1915) comment that it occurs on other West Indian islands is erroneous (Smith *et al.*, 1994).

Habitat and adult ecology: This subspecies is fairly common throughout Trinidad at all altitudes (Barcant, 1970), while Matthew Cock (pers. comm.) reports that it feeds on flowers of *Bidens pilosa*. It seems to fly throughout the year.

Specimens examined (74♂, 20♀):
TRINIDAD (72♂, 20♀): *Caroni*: Tabaquite Oct.-Dec. 1♂ BMNH, 1♂ BMB; *Mayaro*: Maloney rd., Majoro City Feb. 4♂ AMNH; *Nariva*: Bush Bush Island Dec. 2♂ AMNH; *St. George*: Ariapita Rd. Oct.-Dec. 2♂, 2♀ BMB; Arima Oct.-Dec. 1♀ BMB; Arima Pass May Dec. 6♂ AMNH; Arima rd. 1♀ AMNH; Arima valley Jan. 2♂ AMNH; Blanchisseuse Sep. 1♂ FSCA; Caparo Jan. 3♂ BMNH; Cascade Mt. rd. 2♂, 1♀ AMNH; Caura Aug. 1♂ BMNH; Fondes Amandes Oct.-Dec. 2♂, 1♀ AME, 1♂ BMB; Fort George Sep. 3♂ BMNH; Guanapo Jan. 2♂ AMNH; Hololo Nov. 1♂ AME; Hololo Mt. rd. Apr. 2♂ AMNH; Maraval Nov.-Feb. 1♀ BMB; Mt. Tucuche 2♂ AMNH; Port of Spain Feb. 1♂, 1♀ BMNH, 2♀ MCZ; St. Anns Nov. Dec. 2♂ BMB; Santa Cruz Valley Apr. 1♂, 1♀ AMNH; Simla 1♀ AMNH; *St. Patrick*: La Brea Apr. Sep. 1♂ AMNH, 1♂ FSCA; Siparia Nov. 1♀ AME; *Victoria*: Rock River Jul. 1♂ BMNH; *Not located*: Northern Mts. Dec. Jan. 1♀ BMB; Xeres Field Oct. 1♂ USNM; no specific locality Apr. Aug. Oct.-Jan. 10♂, 4♀ BMNH, 6♂ AME, 3♂, 1♀ BMB, 3♂ MNHN, 2♂ USNM, 2♂, 1♀ AMNH. **COUNTRY UNKNOWN** (2♂): "Ecuador" 1♂ MCZ-error; no specific locality 1♂ AME.

Additional locality data: **TRINIDAD**: *Nariva*: Nariva swamp Sand Hill Apr.; *St. George*: Arima-Blanchisseuse rd., mi. 9.75, Sep.; Blanchisseuse-Paria Bay track Jan.; La Laja South Road, mi. 1.5 Aug.; Morne Bleu-Morne Brule Ridge Sep.; El Tucuche summit Jan.; *St. Patrick*: Palo Seco Oct. (M. Cock, pers. comm.).

Adelpha cytherea aea (C. & R. Felder, 1867)

Figs. **67e,f**; *297*

Heterochroa aea C. & R. Felder (1867: 416)

TL: "Brasilia?". **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//Brazil type//Aea n." [examined]

=*Adelpha cytherea herennia* Fruhstorfer (1915: 522)

TL: Espírito Santo; Rio de Janeiro [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//cytherea herennia Fruhst.//Espírito Santo Brasil ex coll. Fruhstorfer//TYPE//Type//Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//cytherea herennia Fruhst.//Brasilien Rio Fruhstorfer//TYPE//Type" [both examined]

Adelpha cytherea var. *aea* Fldr., Kirby (1871); *Limenitis cytherea herennia* Fruhst., Brown & Mielke (1967)

Identification, taxonomy and variation:

This subspecies is distinguished from all others by there being no orange scaling in cell 2A-Cu$_2$ on the DFW.

Typically, also, there is white visible in the postdiscal band to vein Cu_2. There is variation in whether the orange on the DFW extends posteriorly as far as vein Cu_2, or just to the midpoint of cell Cu_2-Cu_1. This subspecies is rather weakly separated from the nominate, and I have seen a number of specimens intermediate to that subspecies which have sparse scaling down the outer postdiscal series on the DFW in cell 2A-Cu_2. These are marked with a † in the list of specimens examined. However, specimens appear to be phenotypically more stable further south, and I retain this subspecies provisionally until a study of more specimens with accurate data is possible to determine the true nature of the variation.

Felder & Felder (1867) described this taxon based on an unspecified number of male specimens in their own collection, and a syntype is in the BMNH. It matches exactly the original description, which states that the DFW orange extends only as far as the first median vein (vein Cu_2), while the white extends as far as the third median vein (vein M_3). Nevertheless, Fruhstorfer (1915) described a further subspecies, *herennia*, based on specimens from Espírito Santo and Rio de Janeiro, supposedly differing in having less extensive DFW white and thicker DFW orange. Both these differences represent very minor individual variation and Hall (1938) synonymised the name with *aea*.

Range: This taxon occurs from Bahia to Santa Catharina in southeastern Brazil, but occurs as typical individuals in the states of Minas Gerais and Santa Catharina, while intergrades to the nominate subspecies seem to occur typically in more coastal areas. More information is needed to establish the validity of this subspecies with respect to the nominate.

Immature stages: Müller (1886) found the early stages of what was probably this taxon in Santa Catharina (Brazil), although he identified it as "*cytherea*?". The egg is deposited on the lower surface of the leaf at the tip. Early instars are green, but little further information was given on the remainder of the life history.

Habitat and adult ecology: Specimen label data indicate that this subspecies occurs from sea level to 1200m, and flies throughout the year.

Specimens examined (77♂, 31♀): † - trans. to *A. c. cytherea*, thin orange thread down DFW outer postdiscal series in cell 2A-Cu_2.
BRAZIL (73♂, 31♀): *Bahia*: Bahia 1♂ ZMHU, 1♂† MNHN; Itaparica Dec. 1♂ BMNH; *Espírito Santo*: Linhares May 1♂, 1♀† AME; no specific locality 2♂† BMNH; *Goiás*: Bella Vista Nov. 1♂ BMNH; Goyaz 1♂†, 1♀† BMNH; *Minas Gerais*: Belo Horizonte-Brasília, km 500, Apr. 1♂ AME; Leitão, km 142 Curvelo 700m May 1♂ USNM; Leopoldina 1♀ ZMHU; Mariana 1♂ AME; Nova Lima Apr. 1♂ AME; Paracatu Apr. 3♂ AME; Sete Lagôas 720m Apr. 1♀ AME; Tijuco 2♂, 2♀ BMNH; "*Pará*": Itaituba 1♂ ZMHU-error; *Pernambuco*: Pernambuco 1♂ BMNH, 1♂ ZMHU, 1♂, 2♀† MNHN; *Rio de Janeiro*: Corcovado 1♂ MCZ; Guapimirim May 1♀ USNM; Itabapoana 1♂† BMB; Janeiro 1♀ MCZ; Novo Friburgo 1♂, 1♀ AMNH; Organ Mts. 1♀† MNHN; Paineiras May 1♂ USNM; Petrópolis 1♀† USNM; Rio de Janeiro Apr. 6♂†, 1♀† MCZ, 4♂, 1♀ BMNH, 1♂, 1♀ AMNH, 1♀ ZMHU, 5♂(4†), 1♀† MNHN, 1♀† USNM; Rio Teresópolis May 3♂† AME; Tijuca 1♀† USNM; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 2♂ FSCA; Blumenau 1♀ BMNH, 1♂, 2♀ ZMHU; Brusque Jul. 1♂ AME; São Bento do Sul 850m Feb. 1♂ AME; Joinville Mar. 2♂ AMNH, 1♂ USNM; no specific locality 1♂ BMNH; *São Paulo*: Guarujá Santos sea level Feb. Mar. 3♂ BMNH, 2♂ AME; Itanhaen May 2♂ BMNH; Mendes 1♂, 2♀(1†) AME; Santos May 4♂, 1♀ AMNH; São Paulo Jul. 2♀† BMNH, 1♀† AME; no specific locality 1♂, 1♀ BMB; *Not located*: Pararaiba Oct. 1♂† AME; no specific locality 1♂ BMNH, 1♀ AME, 1♂ BMB, 4♂ MNHN. **COUNTRY UNKNOWN** (4♂): no specific locality 1♂† MNHN, 3♂ MCZ.

Additional locality data: **BRAZIL**: *Distrito Federal*: Brasília Country Club 1200m Jun.; Chapada da Contagem 900m Feb.; Jardim Zoológico 1000m Feb. Jun.; Parque do Gama 1100m Jun.; Sobradinho River and Woods 1000-1150m Feb. Jun. Aug.; *Goiás*: Chapada dos Veadeiros 1000m; Goiânia 800m Aug.; Leopoldo Bulhões 1000m Dec.; Rio Maranhão 700m Aug.; Vianópolis 1000m Mar.; *Minas Gerais*: km 485 BR-040 600m Feb. Aug.; Paraopeba Woods 750m Feb; Ponte Funda Mar. (Brown & Mielke, 1967); *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *Santa Catharina*: Jaraguá (Hoffmann, 1936); *São Paulo*: Mata de Santa Genebra, nr. Campinas (Ecoforça, 2000); Parque Estadual Morro do Diabo (Mielke & Casagrande, 1997).

Adelpha cytherea daguana Fruhstorfer, 1913

Figs. **67g-j**; 158a,b; 241a,b; *297*

Adelpha daguana Fruhstorfer (1913: 108b; 1915: 521)

TL: [Río Dagua, Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//R//34//R. Dagua, Colombia W. Rosenberg//daguana//108 b4//cytherea daguanae Fruhst."; **BMNH**(M): **ST**♂: "Río Dagua Colombia W. Rosenberg//cytherea daguana Fruhst.//Fruhstorfer Coll. B.M. 1937-285" [both examined]

=*Adelpha tarratia* Fruhstorfer (1913: 108b; 1915: 521) **syn. nov.**

TL: Paramba, Ecuador. **OTL**: [Paramba, Ecuador]. **Types**: **BMNH**(T): **LT**♂: "cytherea tarratia Fruhst.//Paramba Ecuador//Fruhstorfer Coll. B.M. 1937-285//TYPE//Type//Syntype"; **PLT**♀: "Paramba Ecuador//Fruhstorfer Coll. B.M. 1937-285//TYPE//Type"; **BMNH**(R): **PLT**?♂: "Zamora Ecuador 3-4000' (O.T. Baron)//cytherea tarratia Fruhst.//R" = *cytherea cytherea* [all examined]

=*Adelpha cytherea despoliata* Fruhstorfer (1915: 521) **syn. nov.**

TL: Colombia. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//115//Fruhstorfer Coll. B.M. 1937-285//despoliata Fruhst.//Columbien ex coll. H. Fruhstorfer//TYPE//Type//Syntype"; **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//116//Columbien ex coll. H. Fruhstorfer//TYPE//Type"; **BMNH**(M): **ST**♂: "Columbien ex Coll. H. Fruhstorfer//cytherea despoliata Fruhst.//Fruhstorfer Coll. B.M. 1937-285" [all examined]

Adelpha cytherea daguana Fruhst., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. c. marcia* by having the inner postdiscal series on the DFW orange, so that the area immediately distal of the white area in cell 2A-Cu_2 is orange rather than dark brown. There is great variation in the width of the white postdiscal band on both wings (Fig. 67g-j), which in occasional specimens is almost completely absent, while the white on the DFW may extend to vein M_3. Some of this variation may merit subspecific recognition, and this is discussed below.

Fruhstorfer (1913) introduced the name *daguana* on plate 108b, and later placed it as a subspecies of *A. cytherea*, stating that the name was based on specimens from Río Dagua, the type being in the Tring Museum (now the BMNH(R)) (Fruhstorfer, 1915: 521). Fruhstorfer's intended holotype is the first listed syntype (Fig. 67j). He also stated that the white band was not always so reduced as in the figured specimen. On the same plate he figured a further new subspecies, *tarratia*, the intended holotype being from Paramba in western Ecuador (Fruhstorfer, 1915: 521) (Fig. 67h,i), supposedly distinguished by the white on the DFW extending into cell Cu_2-Cu_1, and, under the name *cytherea*, a specimen which he later described as *A. cytherea despoliata* (Fruhstorfer, 1915). *Adelpha c. despoliata* was based on an unspecified number of specimens from Colombia, which he stated differed from the nominate subspecies in having a darker orange DFW band and less extensive white on the DFW, neither of which are consistent differences. Fruhstorfer, in fact, appears not to have noticed the orange inner postdiscal series on the DFW that distinguishes this subspecies from *A. c. cytherea*, since one of his syntype specimens of *tarratia* is actually the nominate subspecies. I therefore designate the syntype specimen with the following label data, which was Fruhstorfer's intended holotype, as the lectotype of *Adelpha tarratia*: "cytherea tarratia Fruhst.//Paramba Ecuador// Fruhstorfer Coll. B.M. 1937-285//TYPE//Type//Syntype". While the lectotype of *tarratia* and syntypes of *despoliata* only differ slightly in the former having narrower orange and white dorsal bands, the first listed syntype (the intended holotype) of *daguana* has much thinner DHW white bands, and since this specimen is from a locality geographically intermediate between northwestern Ecuador and central Colombia, Hall (1938) retained all three of these names as representing valid subspecies. Neild (1996) also used the name *despoliata* to refer to Venezuelan specimens west of the Cordillera de Mérida. It is true that the majority of specimens from the western slopes of the Cordillera Occidental in Colombia and northern Ecuador typically have very narrow white DHW bands, while specimens from central Colombia to northwestern Venezuela, and from central and southern Ecuador, typically have broader white DHW bands. However, since specimens with broader white DHW bands occur fairly frequently throughout western Colombia as far as western Panama, and specimens with narrow bands occur occasionally throughout western Ecuador, I do not believe that the width of the band is a sufficiently stable character to allow certain identification and retention of more than a single subspecies in this region, and I therefore synonymise both *tarratia* and *despoliata* with *daguana* (**syn. nov.**). However, I have also included information about the distribution of these phenotypes in the list of specimens examined below.

I have examined few specimens from northern Venezuela, but there is some indication that there may be a distinct subspecies along both slopes of the Cordillera de la Costa. These specimens typically have more extensive white on the DFW, extending to vein Cu$_1$ or M$_3$, and the inner postdiscal series on the DFW is orange in cell 2A-Cu$_2$ (Fig. 67g). The DFW in fact closely resembles that of *A. c. nahua*, and it is not clear whether these specimens may represent some clinal variation towards that subspecies, although I have seen little variation in *A. c. nahua* itself. I include them here as *A. c. daguana* until more information is available.

Range: This subspecies extends from eastern Costa Rica, where it broadly intergrades with *A. c. marcia*, west of the Andes to Ecuador and northwestern Venezuela. In Venezuela, typical specimens occur in the Catatumbo region west of the Cordillera de Mérida, while its distribution in the remainder of northern Venezuela is complex, and specimens from there may prove to belong to a distinct subspecies.

Immature stages: Aiello (1984) reared this subspecies in Panama, and figured the head capsule (fig. 2), mature larva (fig. 4) and pupa (fig. 6). The egg is typical of the genus. The mature larva is patterned with dark and light brown, with darker oblique lateral stripes on segments A3-A8, and a thin white subspiracular line extends to form a broader lime green mark on A7-A9. Scoli on segments T2, T3 and A2 are relatively short and thick, particularly that on A2 which has a very broad base, with fine lateral spines, while those on A7 and A8 are thinner and shorter, with a broad base on A7. Remaining scoli are all very short with a terminal rosette of thin spines. The head capsule has long, thin lateral spines, reduced chalazae, mostly lacks setae and has dark pits on the face. The pupa has a moderately developed projection on A2, triangular head horns and is straw-coloured, with a fugitive silver or gold sheen. Small also reared this taxon in Panama and there are head capsules and pupal cases in the USNM.

Habitat and adult ecology: This subspecies is very common throughout its range in a wide variety of habitats, similar to the nominate subspecies and *A. c. marcia*, from sea level to 1500m. Males perch in open areas near forest low to the ground, throughout the day. Andrés Orellana (pers. comm.) found this subspecies feeding on fermenting fruits of *Bunchosia cornifolia* (Malpighiaceae), in Panama in August.

Specimens examined (512♂, 116♀): † - narrow DHW band, like holotype *daguana*; ‡ - trans. to *A. c. marcia*: * - DFW white extends to vein M$_3$, orange extends to white in cell 2A-Cu$_2$; # - trans. to *A. c. cytherea*.

COSTA RICA (5♂): *Limón*: Limón 1♂ BMNH; *Puntarenas*: Esquinas, nr. Golfito 2♂ MCZ; Osa Feb. 1♂ FSCA; Palmar Norte Mar. 1♂ FSCA. **PANAMA** (70♂, 32♀): *Bocas del Toro*: Almirante 2♂ AMNH; Bocas del Toro Mar. 1♂ USNM; *Chiriquí*: Burica I. [Col.] Feb. (J.H. Batty) 1♂‡ BMNH; Chiriquí May 1♂ ZMHU, 2♂‡ USNM, 1♂ BMB, 1♀‡ MCZ; Chiriquicito Mar. 1♀ USNM; Santa Cruz Aug. 1♂ USNM; *Colón*: Fort Sherman Jan. 1♂ AMNH, 1♀ FSCA; Gamboa Jan. Dec. 1♂, 1♀ USNM; Gatún Aug. 2♂ AME; Lion Hill 1♂ BMNH; Pipeline road Jan. 1♂, 1♀ AMNH; Piña 100m Mar. Apr. Jun. Jul. 3♂ FSCA, 7♂(1‡), 9♀(3‡) AME; Puertobello Jun. 1♀ AME; no specific locality 1♂ ZMHU; *Darién*: Caña 400-900m Mar. Jul. Aug. 6♂(1†), 3♀ USNM; Cerro Pirre 350-500m Mar. Jul. 2♂, 4♀(1†) USNM; *Herrera*: Cerro Montuoso 600m Sep. 1♂ USNM; *Panamá*: Ancón Hill 1♂ AMNH; Arraiján 2♂, 1♀ AMNH; Barro Colorado Island Feb. Nov. Dec. 8♂‡, 3♀‡ MCZ, 1♂ AMNH; Cerro Azul 1♂ BMNH; Cerro Campana Jan. Jul. 1♂ AMNH, 1♀ USNM; Cerro Jefe 2000' Apr. 1♀ USNM; Cocolí Dec. 1♀ USNM; Corozal 1♂ AMNH; El Llano, 7 mi. N., Oct. 1♀ USNM; La Pita Jul. 1♂ USNM; Río Trinidad 2♂ AMNH, 1♂ USNM; Summit Nov. 1♂ USNM; *Veraguas*: Calobre 1♂ BMNH; Isla Coiba Dec. Feb. 2♂ USNM; no specific locality 4♂‡, 1♀‡ BMNH; *Not located*: Canal area Jan. 1♂ AME; Canal zone Feb. Mar. 2♂ AMNH, 2♂ BMB; no specific locality 1♂, 1♀ AMNH, 1♂ BMNH. **COLOMBIA** (341♂, 65♀): *Antioquia*: Casabe, Río Magdalena Jan. Oct. Nov. 3♂, 3♀ AMNH, 1♀† AME; Crystallina 1100' Jun. Jul. 4♂ BMB; Maceo 1♀ BMNH; Medellín 1♀ USNM; Mutatá Apr. 1♂ ESM; Puerto Berrío May-Aug. 2♂, 1♀ BMB; *Boyacá*: Muzo Jun. Jul. 3♂, 2♀ BMNH, 3♀ AME; Otanche Nov. 2♂, 1♀ JFL; *Bolívar*: Cartagena 1♂ BMNH; *Caldas*: La Dorada Apr. 1♂ USNM; Manizales 3♂ BMNH; Río de la Miel Mar. 1♂ ESM; no specific locality 1♂ AMNH; *Cauca*: Guapí Jan. Jul. 1♂† ESM, 1♂ JFL, 1♂ FSCA; Pescador 1450m Feb. Dec. 12♂ AME; Popayán 1♂ BMNH; Santander 950m Jun. Nov. Dec. 6♂(1#), 2♀ AME; Timbió 1000m Oct. 1♂, 1♀ AME; *Chocó*(†-DHW band typically narrow, but varies throughout): Bahía Solano 1♂ JFL; Guarato Mar. 3♂ USNM, 1♂ MUSM; Río San Juan 1♂ BMNH, 1♂ ZMHU; Tadó 1♂ JFL; *Cundinamarca*: Bogotá Aug. Sep. 101♂, 6♀ BMNH, 8♂, 2♀ BMB, 3♂ MCZ, 3♂, 1♀ AMNH; env. Bogotá 3♂, 1♀ BMNH; Région du Bogotá 5♂, 2♀ BMNH; Cananche Sep. 9♂ BMNH; La Vega Jan. 1♂ BMNH; Salinas 4-8000' Jul. 1♂ BMB; *Magdalena*: El Banco 1♂† BMNH; Finca Unión, Río Guachaca, Santa Marta 50m Jul. 1♂, 1♀ BMNH; Río Guachaca sea level Jul. Sep. 7♂ BMNH; *Nariño*: Piedrancha Dec. 1♂ AMNH; *Risaralda*: Dist. Pereira 1♂, 1♀ BMNH; Hda. Bacorí, Pueblo Rico Oct. 2♂† MUSM; Itaburi 9♂, 1♀ AMNH; La Olleta Jan. 1♂ MHNUC; La Unión, Pblo. Rico 420m Jan. 1♂† MHNUC; Mumbu 1♂ AMNH; Santa Cecilia Aug. Nov. 1♂† ESM, 3♂, 1♀ AMNH; Suaruga 2♂, 1♀ AMNH; *Santander*: Barrancabermeja 1♂ AMNH; La Borroscosa 7♂, 2♀ AMNH; La Danta, Río Opón region 3♂, 2♀ AMNH; La Lechera Dec. 4♂, 1♀ AMNH; La Lindera 1♂ AMNH; Landázuri 1♂ AMNH; La Santa Marta 1♀ AMNH; La Sevilla Jan. 6♂ AMNH; La Soledad Dec. 3♂ AMNH; Río Opón 1♀ AME; Río Suárez Aug. 1♂, 1♀ AMNH; *Tolima*: El Santuário 1♂ BMNH; Río Frío 950m Mar. 1♂ AME; *Valle del Cauca*: Buenaventura Dec. 1♂† FSCA; Cali 1000m Oct. 2♂† MUSM; Corinto, Cauca 4♂, 1♀ BMNH; Córdoba 2♂† JFL; Espejuelo, nr. Cali Feb.-Apr. 1♂ LMC, 1♀ BMNH; Garrapatas May 800m 1♂† KWJH; Jamundí Jan. 1♀ FSCA; Juntas, Cauca 1♂† BMNH; Pance 3000' Jan. Feb. Aug. 8♂, 2♀ FSCA, 2♂ LMC; Río Anchicayá 500-1000m Jan. Feb. Sep. Dec. 1♂† ESM, 1♀† FSCA, 2♂†, 2♀† AME; Río Dagua Dec. 450m 6♂† BMNH, 1♂† ZMHU, 1♂† AME; Río Sabaletas Feb. 1♀† FSCA; Río Tatabro 200m Feb. Nov. 5♂†, 1♀† FSCA, 2♂†, 1♀† LMC; San Antonio 1♂ BMNH; *Not located*: Bogotá-Buenaventura Dec.-Feb. 2♂† BMNH; Caño Limón Arauca 200m Jun. 1♂† KWJH; Cauca 8♂, 1♀ AMNH, 1♂ BMNH; Cauca (Torné) 2♂ BMNH; Frijoles 1♂ AMNH; Interior of Colombia 1♂ BMNH; Pipiral 4♂ MNHN; no specific locality 18♂ AMNH, 2♂, 1♀ BMNH, 3♀ MNHN, 2♂, 2♀ USNM, 1♂ MCZ. **VENEZUELA** (20♂, 5♀): *Carabobo*: Las Quiguas 1♂* BMNH; San Esteban Jul. Aug. Sep. 8♂, 2♀(* - white DFW to vein Cu$_1$) BMNH, 1♀ BMB, 1♂ MNHN; Puerto Cabello Dec. 1♂* ZMHU, 1♂* AME; Yuma 550m Feb. Jul. 1♂* AME, 1♂*, 1♀* MUSM; *Lara*: Sanare 1♂ MNHN; *Táchira*: San Juan de Colón 550m Aug. 1♂ AFEN; *Zulia*: Estación Catatumbo 150m Jan. 1♂ MUSM; Misión El Rosario 50m Jan. 1♀ MUSM; Tres Bocas 100m Jun. 3♂ AFEN. **ECUADOR** (64♂, 14♀): *Carchi*: Lita, ridge east of Río Baboso 700m Jul. 1♂, 1♀ KWJH; *Chimborazo*: Chimbo 2♂†, 1♀† BMNH; *Esmeraldas*: Cachabé Jan. 6♂†, 1♀† BMNH; Cachabé-Paramba 2♂ BMNH; Esmeraldas 1♀ BMNH; *Imbabura*: Paramba 3500' Feb.-May 15♂, 2♀ BMNH; *Los Ríos*: Quevedo 1♂ BMNH; Río Palenque 1♂ FSCA; *Manabí*: Palmar Oct. 2♂, 1♀ AMNH; *Pichincha*: Alluriquín Jul. 1♀ USNM; Nanegal 1400m May 1♂ AME; Pisotanti 620m Jan. 1♂ MUSM; Río Tandapi May 1♀ AME; Río Toachi 900-1200m May Jun. 4♂ AME; Sto. Domingo de los Colorados 900m May 2♂, 1♀ AME, 3♂ MNHN; Taguaza Jun. 1750m 1♀ MUSM; Tinalandia Apr.-Jul. Sep. Dec. 19♂, 1♀ FSCA, 1♂ DAT; *Not located*: "Oriente" 1♀ AMNH-error; no specific locality 2♂, 1♀ BMB, 1♂ MCZ. "**BRAZIL**" (4♂): *Minas Gerais*: Parque Rio Doce Jul. 3♂ AME-error; *Not located*: "Brasilia" 1♂ MCZ-error. **COUNTRY UNKNOWN** (8♂): Bolívar 1400m 1♂ AME; no specific locality 1♂# MNHN, 6♂ MCZ.

Additional locality data: **ECUADOR**: *Cañar*: Manta Real Aug.; *Carchi*: Lita, ridge east of Río Baboso Aug.; *Esmeraldas*: El Durango Mar. Jul.; El Encanto Dec.; La Chiquita 50m Dec.; La Punta Mar. Aug.; Río Chuchuví 800m Jul.; Río Piguambí Jul.; San Lorenzo-Lita, rd. km 17, Dec.; San Lorenzo-Lita rd., km 18, Jul.; San Lorenzo-Lita rd., km 20, Aug.; San Miguel Jun. Aug.; *Imbabura*: Cachaco 1300m Aug.; Río Verde 1200m Aug.; *Los Ríos*: C. C. Río Palenque Aug.; *Manabí*: Ayampe sea level Mar.; *Pichincha*: Reserva Maquipucuna 1300m Aug.; Unión del Toachi Aug. (Willmott & Hall, sight records); Reserva Maquipucuna Oct. Nov. (Raguso & Gloster, 1996).

Adelpha cytherea olbia (C. & R. Felder, 1867)

Figs. **67k**; *297*

Heterochroa olbia C. & R. Felder (1867: 416)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//Bogotá Lindig Type//Olbia n." [examined]

Adelpha cytherea var. *olbia* Fldr., Kirby (1871)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. c. nahua* by the thinner orange band distal of the white DHW postdiscal band, which only covers the inner postdiscal series. *Adelpha c. nahua* has this orange band covering the inner and outer postdiscal series and the dark brown area between them. The DFW orange is also less extensive, not filling the area between the white postdiscal band and the outer postdiscal series on cell 2A-Cu$_2$. The orange DHW postdiscal band is variable in width, in some specimens touching the distal edge of the white postdiscal band, in others being isolated by a thin, dark brown line.

Felder & Felder (1867) described this taxon based on an unspecified number of male specimens collected by Lindig and labelled "Bogotá", in their collection. They stated that it differed from *A. c. cytherea* in having an orange band distal of the DHW white band, and a syntype is in the BMNH (Fig. 67k). In eastern Colombia, specimens of the nominate subspecies very occasionally occur with this subspecies, with increasing frequency to the south and east. It may be that the Villavicencio region is a blend zone between the nominate subspecies and *A. c. olbia*, which I retain for the present since I have seen no specimens from the area between Villavicencio and the Venezuelan border to the north, where this subspecies may well occur exclusively of the nominate.

Range: This subspecies typically occurs in eastern Colombia in the provinces of Meta and Caquetá, but similar phenotypes have also occasionally been collected in the far eastern lowlands of Ecuador and the Ecuador-Peruvian border, where typical *A. c. cytherea* otherwise occurs.

Habitat and adult ecology: This subspecies is presumably similar in habitat and behaviour to the nominate subspecies. It has been recorded up to 800m in Colombia, but in eastern Ecuador it is known only below 300m, far from the base of the Andes. As Neild (1996) noted, this is one of the few *Adelpha* taxa with an orange postdiscal band distal of the white DHW postdiscal band which occurs outside the eastern slopes of the Cordillera de Mérida in Venezuela, but, unlike Venezuelan subspecies, the inner postdiscal series on the DFW is not orange.

Specimens examined (84♂, 19♀): † - trans. to *A. c. cytherea*.

COLOMBIA (78♂, 17♀): "*Boyacá*": Muzo 2♂, 1♀ AME-error; *Caquetá*: Florencia 1300' Jan. 1♂ USNM; Montañita 350m Jan. 1♂† USNM; San Vicente 1♂ USNM; Vereda San Jorge, Moravia Jan. 1♂ MHNUC; *Cundinamarca*: Bogotá 6♂ BMNH; Région du Bogotá 5♂, 2♀ BMNH; *Meta*: Buenavista 800m Jul. 1♂ AME, 1♂ AMNH; Restrepo Jun. 2♂(1†) JFL; Río Ariari Aug. 1♂ LMC; Río Guamal Jun. 1♂ AMNH; Río Guatiguie Jan. 1♂ ESM; Río Negro 2400' Jan. 6♂, 1♀† USNM; San José Guaviare 1♂ JFL; Villavicencio 500m Jan. Feb. Jun. 1♂ BMNH, 14♂, 5♀ MCZ, 9♂ AMNH, 2♂, 1♀ (Robbins 14/6/72) USNM, 1♂ FSCA, 10♂, 3♀ AME, 1♀ JFL; Villavicencio-Río Ocoor 350-400m Feb. 1♂ BMNH; *Not located*: Colombia Oriental 1♀ MNHN; Interior of Colombia 1♂ BMNH; no specific locality 6♂, 1♀ AMNH, 2♂, 1♀ BMNH. **ECUADOR** (1♂): *Napo*: Río Coca 300m 1♂ AME; Río Tiputini Apr. 1♀ MJP. **PERU** (2♀): *Loreto*: Castaña 150m Oct. 2♀ MUSM. **COUNTRY UNKNOWN** (5♂): no specific locality 4♂ MCZ, 1♂ USNM.

Adelpha cytherea nahua Grose-Smith, 1898

Figs. **67l,m**; 158c; *297*

Adelpha nahua Grose-Smith (1898: 71)

TL: Mérida [Venezuela]. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//117//nahua Gr.-Sm. Mérida type//Presented by J.J. Joicey Esq. Brit. Mus. 1931-291//Ex Grose Smith 1910//Type//Mérida//Type H.T.//Syntype" [examined]

=*Adelpha wernickei* Röber (1923: 58)

TL: "Colombia"-erroneous?. **Types**: **BMNH**(T): **HT**♂: "Joicey Bequest Brit. Mus. 1934-120//Adelpha wernickei Col. Röb.//11.26 Villavicencio Colombia 1920//Type//Type//Holotype" [examined]

Adelpha cytherea nahua Gr.-Sm., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. c. olbia* by the broader orange band distal to the white DHW postdiscal band, which extends across both postdiscal series, and the inner postdiscal series in the DFW being orange in cell 2A-Cu$_2$. There is little variation.

Grose-Smith (1898) described this taxon as a species based on an unspecified number of specimens from Mérida, and the description and syntype in the BMNH (Fig. 67l,m) leave no doubt as to its identity. Apparently unaware of Grose-Smith's description, Röber (1923) described *Adelpha wernickei* based on a single male in the collection of Wernicke in Dresden, supposedly from Colombia. The holotype is now in the BMNH and is typical *A. c. nahua*, matching the description, which stated that the orange DHW band was almost the same width as the DFW band, clearly distinguishing the taxon from *A. c. olbia* with which it was compared. I conclude that this specimen is mislabelled, since I have seen only typical *A. c. olbia* from Villavicencio, and follow Hall (1938) in regarding it as a synonym of *A. c. nahua*.

Range: Eastern foothills of the Cordillera de Mérida in Venezuela.

Habitat and adult ecology: This subspecies appears to be not uncommon up to 1100m and has been collected from June to January. It has a dorsal pattern similar to a number of other sympatric *Adelpha* species with which it appears to be involved in mimicry, including *A. cocala orellanae*, *A. malea malea*, *A. heraclea antonii*, *A. phylaca joffrei*, *A. capucinus gutierrezi* and *A. plesaure pseudomalea*.

Specimens examined (18♂, 3♀):

VENEZUELA (16♂, 3♀): *Apure*: La Ceiba Jan. 1♀ MUSM; *Barinas*: San Miguel, Barinit-San Isidro, km 21, 1100m Oct. 1♂ AFEN; La Chimenca, Barinitas Aug. 1♂ JFL; Pozo, nr. Altamira 800m Aug. 2♂ BMNH; *Lara*: La Escalera 1000m Sep. 1♂ AFEN; Yacambú 800-1000m Sep. 1♂, 1♀ AFEN; *Mérida*: Mérida 1♂, 1♀ BMNH, 1♂ USNM; Mucuchachi 1♂ BMNH, 1♂ BMB; *Táchira*: San Juan de Colón 550m Jun. 1♂ BMNH; Via Chorro del Indio Jun. 1♂ BMNH; *Not located*: Orinoco 3♂ BMB; no specific locality 1♂ BMB. **COLOMBIA** (1♂): "*Meta*": Villavicencio 1♂ BMNH-error. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ USNM.

Adelpha viola Fruhstorfer, 1913

Figs. 6c,i,9,16; **68**; 159; 242; *298*

Identification, taxonomy and variation:

Adelpha viola is distinguished from all similar species by having the third cell bar on the VFW clearly marked in the discal cell. It is also very distinctive in having the outer postdiscal series on the VFW composed of silvery grey dashes which are distinct from the inner postdiscal series throughout the wing, and in the orange subapical spots on the DFW in cells M$_2$-M$_1$ and M$_1$-R$_5$ seemingly composed only of the inner postdiscal series. There are thus two complete rows of silver-grey postdiscal/submarginal markings on the VFW of *A. viola*, in contrast to the single row possessed by A. *cocala*. There is variation in the ventral colour and width of the pale postdiscal band on the VFW, and I recognise two subspecies.

Although superficially similar to *A. cocala*, the male and female genitalia, wing pattern, hostplants and early stages suggest that this species is closely related to *A. salmoneus*, and possibly to *A. cytherea*. Adults of all three of these species have the valvae of the male genitalia lacking distal spines, the sclerotised bands on the corpus bursae in the female genitalia are relatively widely spaced, and the third discal cell bar is visible on the VFW. *Adelpha viola* and *A. salmoneus* have a similarly shaped third discal cell bar, which is thick and concave, differing from other primitive species such as members of the *A. alala* group, possibly indicating it to be secondarily derived and therefore a synapomorphy. This cell bar in *A. cytherea* is straighter and thinner, and therefore may not represent the same character state.

Range and status: Southern Venezuela to northern Peru, east to the mouth of the Amazon, the Guianas, and southeastern Brazil. Rare, in relatively intact lowland forest, from sea level to 600m.

Specimens examined: 89 (36♂, 53♀)

Adelpha viola viola Fruhstorfer, 1913 **stat. nov.**

Figs. **68a,b**; *298*

Adelpha viola Fruhstorfer (1913: pl. 106c; 1915: 516)

TL: São Paulo, Brazil. **OTL**: [Rio de Janeiro; São Paulo (Brazil)]. **Types**: **BMNH**(T): **LT**♀: “cocala riola Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Brasilien São Paulo Fruhstorfer//TYPE//Type”; **BMNH**(R): **PLT**?♀: “Tijuco//Paratype//R//Rothschild Bequest BM 1939-1//cocala riola Fruhst.//Adelpha pseudococala hypochrus Paratype female det. W.T.M. Forbes 1962”; **BMNH**(T): **PLT**♀: “Syntype ♀ Adelpha cocala viola Fruhstorfer G. Lamas det. 1987//Fruhstorfer Coll. B.M. 1933-131//Brasilien São Paulo Fruhstorfer//TYPE//Type//Syntype” = *cocala didia* [all examined]

Adelpha cocala riola [sic] Fruhst., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. v. pseudococala* by the overall more reddish instead of purplish brown ventral colouring, the thinner pale postdiscal band on the VFW and the reduced or absent postdiscal and submarginal series on the VHW. There is little variation.

Fruhstorfer (1913: pl. 106c, labelled as male) figured the dorsal surface of a female from Rio de Janeiro under the name *viola*, then subsequently described the name, misspelt as *riola*, as a subspecies of *A. cocala* (Fruhstorfer, 1915: 516). For reasons discussed under Materials and Methods, I regard the correct spelling as *viola* since it has chronological priority. At the time of the description, Fruhstorfer was unaware of the existence of two superficially very similar species, *A. viola* and *A. cocala*, and the two female syntypes in the BMNH each apply to different species. Hall (1938) also failed to realise this, as did I until a relatively recent examination of both syntypes. The female specimen figured by Fruhstorfer (1913) is, however, unquestionably a specimen of *A. viola* as treated here. In the original illustration, the third cell bar, which distinguishes this species from *A. cocala*, is visible in the DFW discal cell, and the dark band bordering the distal edge of the orange postdiscal band on the DFW is of even width in cells 2A-Cu$_2$ to Cu$_1$-M$_3$; in *A. cocala didia* this dark band thickens noticeably in cell 2A-Cu$_2$, so that its distal edge remains vertical, instead of angling in towards the wing base. Since the specimen that represents *A. viola* in the BMNH(T) is almost identical to that figured by Fruhstorfer, it is otherwise not possible to ascertain to what exactly Fruhstorfer intended the name *viola* to apply, and since this taxon would otherwise lack a name while there is a name, *didia*, available for southeast Brazilian *A. cocala*, I designate that specimen with the following label data as the lectotype of *Adelpha viola*: “cocala riola Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Brasilien São Paulo Fruhstorfer//TYPE//Type”. There is also a single specimen in the BMNH(R) from Tijuco which is probably a syntype of this taxon, possibly the one on which Fruhstorfer based the range of this taxon as including Rio de Janeiro, since there appear to be no more plausible syntypes of *viola* from that locality in the BMNH. This specimen is also *A. viola* as treated here, and the name “hypochrus” attached to it is an unpublished manuscript name of W. T. M. Forbes.

Range: Southeastern Brazil, from Rio de Janeiro to Santa Catharina.

Immature stages: Müller (1886) reared and described the early stages of a species from Santa Catharina, Brazil, which he identified as “sp. nr. *cocala*”. The larval illustration and the reported hostplant, *Sabicea* sp. (Rubiaceae), suggest it was probably this taxon. The egg is typical of the genus and is deposited on the upperside of the leaf at the tip. Early instars are green, while the last instar, which Müller figured on Taf. 3, fig. 2, has black dorsal colouring on segments T1-A2, and A8. The scolus on A2 is relatively short and swollen, with the scoli on segments A1 and A3-A6 much reduced. This pattern of scoli is much more similar to that of *A. viola pseudococala* than to *A. cocala*, which has much better developed scoli on segments A3-A6, suggesting that Müller’s description does apply to *A. viola viola*. D’Almeida (1931) described the early instars of a species he called “*A. cocala riola*”, which was probably also this taxon. He states that the foodplant was a small climbing plant (“une petite plante grimpante”), which is true of *Sabicea* species, the hostplant of this and related species, but not of the known hostplants of *A. cocala*, which are trees or shrubs. Also, he mentions scoli only on T2, A2, A7 and A8, where they are most prominent in *A. viola*, whereas the scoli are more uniform throughout in *A. cocala*. D’Almeida states that the eggs are whitish yellow and deposited singly on the underside of leaves. The first instar is whitish grey with a brownish yellow head, the second instar is blackish ventrally and laterally with a yellowish tinge on the dorsal surface, with a black head capsule with whitish spines. The third instar is whitish yellow dorsally and laterally, becoming browner with age, with oblique lateral black and yellow-white stripes. Scoli are developed on T2, A2, A7 and A8, with those of T2 and A2 very thick and brownish black.

The last instar figured by Müller (1886) is resting in the Front-Curved-Rear-Up position of Aiello (1984).

Habitat and adult ecology: This subspecies is apparently very rare in the field and nothing has been reported on its habitat or adult ecology. While the early stages described by D’Almeida (1931) as “*A. cocala riola*” may well be this species, his observations on the adult probably apply to the more common *A. cocala didia*.

Specimens examined (6♂, 9♀):

BRAZIL (5♂, 5♀): *Rio de Janeiro*: Corcovado 1♀ BMNH; Rio Janeiro 1♂ BMNH, 1♀ MNHN; Tijuca 1♂, 1♀ USNM; *Santa Catharina*: no specific locality 1♂ BMB; *São Paulo*: São Paulo 1♀ BMNH; *Not located*: no specific locality 1♂ USNM; Tijuco 1♂, 1♀ BMNH. “**FRENCH GUIANA**” (1♀): *Cayenne*: Cayenne 1♀ MNHN-error. **COUNTRY UNKNOWN** (1♂, 3♀): no specific locality 1♂, 3♀ BMNH.

Adelpha viola pseudococala Hall, 1933 **stat. nov.**

Figs. 6c,i,9,16; **68c,d**; 159a,b; 242a-c; *298*

Adelpha pseudococala Hall (1933: 10)

TL: Pará, Brazil. **Types**: **BMNH**(MM): 4**ST**♂, 4**ST**♀: “Pará, A.M. Moss”; **ST**♂: “cocala”; **ST**♂, **ST**♀: “Pará (A.M. Moss)”; **ST**♀: “Adelpha boeotia Pará Sabicea aspera Rub.”; **BMNH**(R): **ST**♀: “Iquitos (Stuart 93)//urraca Feld.//R”; **ST**?♂, 8**ST**?♀: “Pará (A.M. Moss)”; **BMB**: 4**ST**♀: Mabaruma, British Guyana Dec. Jan.; **BMNH**(M): False **ST**♂: “Syntype ♂ Adelpha pseudococala Hall G. Lamas det. 1987//Adelpha cocala Cram. Godman-Salvin Coll. 1916.-4.//Illustrated in the Butterflies of Venezuela A. Neild, 1996//48//Pará//Pará L. Amazons A.R. Wallace//♂//Syntype” [all examined]

Adelpha pseudococala Hall, Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that subspecies. There is little variation.

Hall (1933) described this taxon as a species based on specimens of both sexes reared by the Reverend Miles Moss in Pará, and there are a number of syntypes in the Moss collection at the BMNH, in addition to the BMNH(R) and the BMB. Part of the impetus for his species description was the discovery by Moss (1933) that the early stages of this species and *A. cocala*, of which Hall states he had otherwise believed *A. viola* to be a form, were abundantly distinct. He appears to have been unaware of the presence of the third VFW discal cell bar, the most obvious character distinguishing this species, and thus failed to realise that Fruhstorfer (1913) had already described a southeast Brazilian taxon with which *pseudococala* was clearly conspecific. I therefore place *pseudococala* as a subspecies of *A. viola* (**stat. nov.**).

Range: This subspecies has been recorded from southern Venezuela to northern Peru, east along the Amazon to the river's mouth, and in the Guianas, though the majority of specimens have originated in the latter two areas. Its range is probably more extensive, though it is unrecorded from Rondônia in the most intensive single site Neotropical butterfly survey ever conducted (G. Austin, pers. comm.).

Immature stages: Moss (1933) reared this taxon in Brazil (Pará), and reported the early stages to be "identical in form, attitude and position" to *A. cytherea cytherea*, except slightly larger and greener in the anterior and posterior regions. Both larva and pupa were figured, the former in colour (pl. I, fig. 1, pl. II, fig. 2). The larva in fact does differ from that of *A. cytherea* in having the scoli on T3 longer instead of shorter than those on T2, being similar in this respect to *A. salmoneus*. The scoli are best developed and bear lateral spines on segments T2 (Fig. 6c), T3, A2 (Fig. 6i), A7 and A8, while on remaining segments they are very reduced with terminal spines only. The head capsule has reduced anterior chalazae but long, thin medial and posterior chalazae (Fig. 9). The pupa is notable in having small, triangular head horns (Fig. 16) and the dorsal projection on A2 expanded so that it directs both anteriorly and posteriorly. Moss' figure shows the larva resting in the Front-Curved position.

Habitat and adult ecology: Although widespread, this species is rare throughout most of its range, particularly in the west. It is interesting to note that females significantly outnumber males in collections, possibly due to the hostplant, *Sabicea aspera*, being a plant of open areas and secondary growth. Moss (1933) reports it as a roadside creeper near Pará. In eastern Ecuador I have recorded a single male attracted to rotting fish in a wide, old ridge top light gap in the early afternoon, while a female was encountered at the same site, flying along an open path in logged primary forest around midday. The species seems to occur only in relatively intact primary forest up to 600m, though why it should be so much rarer than *A. cytherea*, with which it shares the same hostplant, is as yet unexplained.

Specimens examined (30♂, 44♀):

VENEZUELA (3♀): *Amazonas*: San Carlos de Río Negro to Solano 100m Mar. 2♀ AFEN; Tobogán de la Selva 100m May 1♀ AFEN. **COLOMBIA** (1♀): *Caquetá*: Montañita Jan. 1♀ USNM. **ECUADOR** (4♂, 1♀): *Napo*: Apuya 600m Feb. Oct. 1♂, 1♀ KWJH; Sinde Oct. 1♂ MJP; *Pastaza*: 32 km S. of Puyo 1000m 1♂ GWB; *Not located*: no specific locality 1♂ BMNH. **PERU** (2♂, 2♀): *Loreto*: Iquitos Jul. 2♂, 1♀ BMNH; Pebas 1♀ ZMHU. **BRAZIL** (10♂, 18♀): *Amazonas*: São Paulo de Olivença 1♂ ZMHU; *Pará*: Pará Jan.-Mar. 9♂, 15♀ BMNH, 1♀ BMB; Santarém 1♀ BMNH; *Not located*: Amaz. S. 1♀ BMNH. **GUYANA** (2♂, 6♀): *Barima/Waini*: Mabaruma Dec. Jan. 4♀ BMB; *Potaro/Siparuni*: Kaietur Falls Feb. Mar. 1♂, 1♀ BMB; *Not located*: no specific locality 1♂, 1♀ AMNH. **FRENCH GUIANA** (8♂, 10♀): *Cayenne*: Cayenne 2♂, 4♀ BMNH; Galion, Roura Jul. Aug. 2♂ MUSM; *Laurent du Maroni*: Maroni River 3♀ AME; St. Jean du Maroni 1♀ BMB, 1♀ MNHN; *Not located*: no specific locality Apr. 3♂, 1♀ BMNH, 1♂ USNM. **SURINAM** (3♂, 2♀): *Brokopondo*: Saramacca R. Nov. 1♀ AME; *Suriname*: Geldersland, Surinam R. 1♀ USNM; *Not located*: no specific locality 2♂ BMNH, 1♂ MCZ. **COUNTRY UNKNOWN** (1♂, 1♀): no specific locality 1♀ BMNH, 1♂ MCZ.

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Specimens examined (30♂, 44♀):

VENEZUELA (3♀): *Amazonas*: San Carlos de Río Negro to Solano 100m Mar. 2♀ AFEN; Tobogán de la Selva 100m May 1♀ AFEN. **COLOMBIA** (1♀): *Caquetá*: Montañita Jan. 1♀ USNM. **ECUADOR** (4♂, 1♀): *Napo*: Apuya 600m Feb. Oct. 1♂, 1♀ KWJH; Sinde Oct. 1♂ MJP; *Pastaza*: 32 km S. of Puyo 1000m 1♂ GWB; *Not located*: no specific locality 1♂ BMNH. **PERU** (2♂, 2♀): *Loreto*: Iquitos Jul. 2♂, 1♀ BMNH; Pebas 1♀ ZMHU. **BRAZIL** (10♂, 18♀): *Amazonas*: São Paulo de Olivença 1♂ ZMHU; *Pará*: Pará Jan.-Mar. 9♂, 15♀ BMNH, 1♀ BMB; Santarém 1♀ BMNH; *Not located*: Amaz. S. 1♀ BMNH. **GUYANA** (2♂, 6♀): *Barima/Waini*: Mabaruma Dec. Jan. 4♀ BMB; *Potaro/Siparuni*: Kaietur Falls Feb. Mar. 1♂, 1♀ BMB; *Not located*: no specific locality 1♂, 1♀ AMNH. **FRENCH GUIANA** (8♂, 10♀): *Cayenne*: Cayenne 2♂, 4♀ BMNH; Galion, Roura Jul. Aug. 2♂ MUSM; *Laurent du Maroni*: Maroni River 3♀ AME; St. Jean du Maroni 1♀ BMB, 1♀ MNHN; *Not located*: no specific locality Apr. 3♂, 1♀ BMNH, 1♂ USNM. **SURINAM** (3♂, 2♀): *Brokopondo*: Saramacca R. Nov. 1♀ AME; *Suriname*: Geldersland, Surinam R. 1♀ USNM; *Not located*: no specific locality 2♂ BMNH, 1♂ MCZ. **COUNTRY UNKNOWN** (1♂, 1♀): no specific locality 1♀ BMNH, 1♂ MCZ.

Adelpha salmoneus (Butler, 1866)

Figs. **69**; 160; 243; *298*

Identification, taxonomy and variation:

This species is distinguished from all superficially similar species by the presence of a thick, curving third cell bar in the VFW discal cell. There is geographic variation in the width and shape of the orange DFW band and the expression of the VHW postdiscal band, postdiscal and submarginal series, and four subspecies are recognised.

This species appears to be most closely related to *A. viola*, with which it shares a very similar pattern of VFW discal cell bars, notably a prominent, curved third cell bar and a slanting first cell bar. The male and female genitalia, and the immature stages, with the thick, conical scolus on segment A2 of the final instar larva and posteriorly pointing dorsal projection on segment A2 of the pupa, in addition to the shared larval hostplant *Sabicea*, also indicate a close relationship.

Range and status: Mexico to western Ecuador, northern Venezuela to Bolivia, in lowland and premontane rain forest from around 100m to 1700m. Uncommon to very rare.

Specimens examined: 156 (109♂, 47♀)

Adelpha salmoneus salmoneus (Butler, 1866)

Figs. **69a,b**; *298*

Heterochroa salmoneus Butler (1866: 667, fig. 1)

TL: Venezuela. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//B.M. TYPE No. Rh. 9798 Heterochroa salmoneus ♂ Butl.//H. salmoneus Butl. type//Venezuela//Type//Syntype"; **BMNH**(M): 2**ST**?♂: "Venezuela" [same label as ST] [all examined]

Adelpha salmoneus Butl., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. s. colada* by the silvery white postdiscal band on the VHW being more heavily marked, so that the white spot in cell Rs-Sc+R$_1$ is less noticeably isolated from the rest of the band, the more pronounced inner submarginal series of silvery grey spots on the VHW and the straighter basal edge of the orange DFW band, which is less noticeably kinked at the base of cell Cu$_1$-M$_3$. *Adelpha s. emilia* has a broader orange DFW band with a straight basal edge which passes through the origin of vein Cu$_1$, the silvery white VHW postdiscal band is thicker and uniformly coloured throughout, and the inner and outer postdiscal series on the VHW are more strongly and distinctly marked. *Adelpha s. salmonides* has a slightly narrower orange DFW band with a straight basal edge. I have examined a single female in the ZMHU, collected by Dr. Schultz in the Sierra Nevada de Santa Marta, which I have placed for the present as this subspecies. It differs from typical specimens in having much more faded submarginal series on the VHW, and since it appears to represent a population that may well be isolated from the nominate, more material may show it to be a distinct subspecies.

Butler (1866) described this species from an unspecified number of specimens from Venezuela in the British Museum, and figured the ventral surface, which clearly shows the third discal cell bar. I have examined a syntype (Fig. 69a,b) and two further possible syntypes.

Range: I have seen only a single accurately labelled specimen that definitely represents this subspecies, from the eastern slopes of the Cordillera de Mérida, while Neild (1996) states that it also occurs in Venezuela on the western slopes of the Cordillera de Mérida and in the Cordillera de la Costa. I have seen only four specimens from Colombia, all in the BMB, and the presence of this subspecies there requires confirmation.

Habitat and adult ecology: Neild (1996) reports this subspecies from near sea level to 1200m, and states that it is rare in the field.

Specimens examined (10♂, 2♀):
VENEZUELA (7♂, 1♀): *Barinas*: Barinit-San Isidro Dec. 1♂ AFEN; *Not located*: no specific locality 6♂, 1♀ BMNH. **COLOMBIA** (2♂, 2♀): *Cundinamarca*: env. Bogotá 1♂ BMB; *El César*: Pueblo Bello 1100m Jul. 1♀ BMNH; *Not located*: Casa Blanca Sierra Nevada de Santa Marta 1200m Apr. 1♀ ZMHU; no specific locality 1♂, 1♀ BMB. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMB.

Adelpha salmoneus colada (C. & R. Felder, 1867)

Figs. **69c,d**; *298*

Heterochroa colada C. & R. Felder (1867: 420)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♀: “Syntype//Bogotá Lindig Type//Colada Felder//Colada n.” [examined]

Adelpha colada Fldr., Kirby (1871); *Adelpha salmoneus colada* Fldr., Hall (1938)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the generally more irregular basal edge of the orange DFW band, particularly at veins Cu_1 and M_3 where it is noticeably indented, and by the distal edge of the band being typically slightly produced in cell M_3-M_2. On the VHW, the white postdiscal spot in cell Rs-Sc+R_1 is much broader than the remainder of the postdiscal band, the basal edge of which is marked by a thin dark brown line which is strongly kinked at veins Cu_1 and Rs, and the spots of the inner submarginal series are all reduced in size. There is clinal variation in this subspecies; from north to south the edges of the orange DFW band become more irregular, the VHW silvery grey postdiscal and submarginal markings become more reduced to almost absent, and the pale VFW postdiscal band has increased amounts of red-brown scaling obscuring the edges and separating the postdiscal and submarginal series in cells Cu_2-Cu_1 and Cu_1-M_3.

This taxon was described as a species by Felder & Felder (1867), based on a male specimen or specimens collected at Bogotá by Lindig in the Felder collection. They compared it with *Adelpha ximena*, stating that it was smaller and had a less produced hindwing margin. The only syntype in the BMNH actually proves to be a female, which, although slightly worn, has all of the diagnostic characters of this subspecies. Fruhstorfer (1915) retained the taxon as a distinct species, but Hall (1938) placed it as a subspecies of *A. salmoneus* and also noted that there was a similar specimen in the BMNH from Inambari River, which does indeed represent this subspecies.

Range: Eastern slopes of the Andes from Colombia, near Bogotá, to Bolivia.

Habitat and adult ecology: Despite occurring throughout the eastern Andes in some of the most heavily collected areas of the Neotropics, this subspecies remains very rare in collections. In eastern Ecuador it is known from 600m at the base of the Andes to 1600m in primary forest habitats, and this presumably applies to the subspecies throughout its range. I have observed males to be locally common on open paths along the tops of ridges with steep, forested slopes, where they perch on isolated bushes 1-4m above the ground with the wings open. Andrew Neild (pers. comm.) also captured a specimen perching on top of a 4-5m high bush beside a stream, in a small orchard within primary forest, at the base of the Andes. The only female I have seen was flying along a wide path with abundant secondary growth around the middle of day. The behaviour of this subspecies is very similar to that of *A. s. emilia*, and it is not clear why it is so much rarer in collections.

Specimens examined (12♂, 6♀):
COLOMBIA (3♂, 3♀): *Caquetá*: Caquetá Oct. 1♂ JFL; *Cundinamarca*: Bogotá 1♀ BMNH; env. de Bogotá 1♀ BMNH; *Huila*: Garzón Mar. 1♂ JFL; *Meta*: Río Negro 800m Feb. 1♀ ESM; *Nariño*: San Pablo el Carmen, camino del oleoducto a Orito 1300m Sep. 1♂ MHNUC. **ECUADOR** (5♂, 1♀): *Morona-Santiago*: Río Abanico 1600m Oct.-Dec. 2♂, 1♀ KWJH; *Napo*: Pimpilala 600m Sep. 1♂ KWJH; *Pastaza*: Puyo-Tena rd., km 25, 1000m Oct. 1♂ GWB; Puyo-Tena rd., km 31, 600m Jun. 1♂ DAT. **PERU** (3♂, 1♀): *Cuzco*: Quebrada Quitacalzón, Cosñipata 1050m Sep. 1♂ MUSM; *Pasco*: Pozuzo 1♀ MUSM; *Puno*: Oroya, Inambari, 3500' Nov. ‘01 Wet (Ockend) 1♂ BMNH; Río Távara 1050m Aug. 1♂ MUSM. **BOLIVIA** (1♂, 1♀): *La Paz*: Coroico May 1♂ MCZ; Río Songo 1♀ ZMHU.
Additional locality data: **ECUADOR**: *Napo*: San Rafael 1200m Aug.; *Zamora-Chinchipe*: Chachacoma Nov. (Willmott & Hall, sight records).

Adelpha salmoneus emilia Fruhstorfer, 1908

Figs. **69e,f**; 160a,b; *298*

Adelpha salmoneus emilia Fruhstorfer (1908: 9) (also 1909a: 41)

TL: Muzo, Colombia. **Types**: **BMNH**(T): **ST**♂: “salmoneus emilia Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Columbien Muzo H. Stichel// TYPE//Type//Syntype” [examined]

Heterochroa salmoneus emilia Fruhst., Hoffmann (1940) (actually *A. salmoneus salmonides*); *Adelpha salmoneus emilia* Fruhst., de la Maza (1987) (actually *A. salmoneus salmonides*); *Adelpha colada* F. & F., Raguso & Gloster (1996) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from *A. s. salmoneus* and *A. s. colada* by the straight basal edge of the orange DFW band, the thicker, uniformly coloured silver-grey VHW postdiscal band and the more brightly and distinctly marked submarginal and postdiscal series on the VHW. *Adelpha s. salmonides* has a thinner orange DFW band and a thinner silver-grey VHW postdiscal band. There is some variation in the brightness of the silvery VHW postdiscal markings and the thickness of the silvery white VHW postdiscal band.

Fruhstorfer (1908) described this subspecies based on two males from Muzo collected by Stichel and additional males from Bang Haas and Wernicke, and stated that it was distinguished by the broader, white instead of grey-violet VHW postdiscal band. A syntype is in the BMNH (Fig. 69e,f). The description was erroneously repeated one year later in the same journal (Fruhstorfer, 1909a).

Range: This subspecies is known from the slopes of all three Colombian cordilleras except the eastern slopes of the Cordillera Oriental, to northwestern Ecuador.

Habitat and adult ecology: This is the most common subspecies of *A. salmoneus* in collections, but it is nevertheless, in my experience, local and generally uncommon. In northwestern Ecuador I have encountered small groups of males perching all day on the tops of bushes around 4-5 m above the ground in large ridge top light gaps, with the wings outspread, flying out periodically to investigate passing butterflies and returning to same perch. Raguso & Gloster (1996) report a species as *A. colada*, which I presume to be this taxon, from Reserva Maquipucuna in western Ecuador. They found males perching from 6-15m above the ground in ridge top forest light gaps and sunflecks, from 11am to 2.30pm. This subspecies is known only from relatively intact, premontane rain forest habitats from 300-1700m, where it appears to fly throughout the year. However, in western Ecuador at least, it is certainly most common in the wet season.

Specimens examined (60♂, 16♀):
COLOMBIA (51♂, 16♀): *Antioquia*: Frontino 1♂ BMNH; Medellín 1♂

AME, 4♂, 1♀ BMB; *Boyacá*: Muzo 4-800m Jun. Jul. 1♂, 2♀ BMNH, 1♂ USNM, 10♂, 1♀ BMB, 1♂ MCZ; Otanche Oct. 1♂, 1♀ JFL; *Caldas*: Victoria Jun. Dec. 1♂ ESM, 1♂ USNM; *Cundinamarca*: Bogotá 5♂, 2♀ BMNH, 1♂ ZMHU, 1♂, 2♀ USNM, 5♂ BMB; env. de Bogotá 3♂, 1♀ BMNH; Cananche 2♂, 1♀ BMNH; *Risaralda*: Río Mistrato 900m Sep. 1♀ MHNUC; Tapartó, Pblo. Rico 600m Oct. 1♂ MHNUC; *Santander*: La Borroscosa 5-750m Dec. 1♂ AMNH; La Carmen, Río Opón region 1000m Dec. 1♀ AMNH; La Santa Marta, Río Opón region 1000-1200m Nov. 1♂ AMNH; *Tolima*: Río Chili 1♂ BMNH; *Valle del Cauca*: Farallones, km 55, Jul. 1♂ KWJH; Queremal 1200m Jul. 1♀ LMC; Río Cajumbre 100m Aug. 1♂ LMC; *Not located*: Cauca valley 1♀ AMNH; Int. of Colombia 1♂ BMNH; "Ecuador Río Ayada vic. Dec." 1♂ USNM-error; no specific locality 1♂ BMNH, 1♂ ZMHU, 2♂ BMB, 1♀ AMNH. **ECUADOR** (3♂): *Carchi*: Lita, ridge east of Río Baboso Aug. 1♂ KWJH; *Esmeraldas*: La Punta, km 44 Lita-San Lorenzo rd. 300m Mar. Jun. Jul. 2♂ KWJH. **COUNTRY UNKNOWN** (6♂): no specific locality 2♂ USNM, 2♂ MCZ, 2♂ AMNH.

Additional locality data: **ECUADOR**: *Carchi*: Lita, ridge east of Río Baboso 900m Jul.; *Esmeraldas*: Finca Durán 600m Jul. (Willmott & Hall, sight records); *Pichincha*: Reserva Maquipucuna 1550-1700m Aug. Nov. Dec. (Raguso & Gloster, 1996).

Adelpha salmoneus salmonides Hall, 1938

Figs. **69g,h**; 243a-c; *298*

Adelpha salmoneus salmonides Hall (1938: 186)

TL: Nicaragua. **Types**: **BMNH**(T): **HT**♂: "Holotype ♂ Adelpha salmoneus salmonides Hall G. Lamas det. 1987//16 73//B.C.A. Lep. Rhop. Adelpha salmoneus Butl. Godman-Salvin Coll. 1916.-4.//♂//Chontales Nicaragua T. Belt//Holotype"; **BMB**: **PT**♂: "Belize Sept. 1923 A. Hall//♂//Paratype//Booth Mus. Coll. 000811"; **PT**♂: "Guatemala Barrios 25 Dec. 1912 A. Hall//♂//Paratype//Booth Mus. Coll. 000810" [all examined]

Adelpha salmoneus emilia Fruhst., Fruhstorfer (1908, 1915) in part; *Heterochroa salmoneus emilia* Fruhst., Hoffmann (1940) misid.; *Adelpha salmoneus emilia* Fruhst., de la Maza (1987), de la Maza & de la Maza (1993) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from *A. s. emilia* and *A. s. salmoneus* under their respective accounts. There is clinal variation throughout Central America in the width of the orange DFW band, with specimens from the western end of the range having the narrowest bands, leaving a small area of dark brown at the base of cell Cu_1-M_3, and in the expression of the inner and outer postdiscal series on the VHW, which are reduced in western specimens giving a darker appearance to the VHW.

Hall (1938) described this subspecies in comparison with the nominate, but it is perhaps more similar to *A. s. emilia*, as which Fruhstorfer (1908, 1915) identified central American specimens. I have examined the holotype (Fig. 69g,h) and the two paratypes.

Range: *Adelpha s. salmonides* is known in Mexico from the state of San Luís Potosí, whence it was reported from a single female by Field (1940b: as *A. salmoneus emilia*), throughout Central America to central Panama.

Immature stages: Aiello (1984) reared this subspecies in Panama and figured the last instar (fig. 4), its head capsule (fig. 2) and the pupa (fig. 6). The egg is similar to other species of the genus and is deposited on the upperside of a leaf, either at the tip, or more rarely, near a damaged portion. Second to fourth instars are dark brown with grey oblique lateral stripes and are well camouflaged amongst the pale veined leaves of their hostplant. The fourth and fifth instars have red-brown heads, and the early fifth instar larva is brownish green, becoming bright yellow green in the late instar, the dorsal area of segments A4-A5 is purple brown and both these segments have a dark purple lateral mark. The scoli on T2, T3, A2 and A7 are brown purple, while that of A8 is green. Scoli on T2, T3, A2, A7 and A8 are all thick with numerous thin lateral spines, those on T3, A2 and A7 have a noticeably swollen base. Remaining subdorsal scoli are very short and lack lateral spines, while there is a long, thinner supraspiracular scolus on A2 with lateral spines. The head capsule is unpatterned, has long lateral spines and relatively reduced chalazae. The pupa is bronze with dorsal gold coloration, the pronounced dorsal projection on A2 extends both anteriorly and posteriorly and the head horns are small and triangular. Larval development times are given and the total development time ranges from 32-35 days (Aiello, 1984: table 2).

Habitat and adult ecology: This subspecies has been recorded from near sea level to 1200m in wet rain forest habitats, in or near montane areas (de la Maza, 1987; DeVries, 1987; de la Maza & de la Maza, 1993). Although there are records throughout the year, de la Maza & de la Maza (1993) report it most frequently from May to September in Mexico, while DeVries (1987) reports that in Costa Rica it can be locally abundant in the dry season, February and March. In Costa Rica (Hall & Willmott, 1993), I have observed males perching on bushes and trees along a wide forest path around 4m above the ground, exhibiting behaviour similar to South American subspecies, in the middle of the wet season.

Specimens examined (26♂, 22♀):

MEXICO (5♂, 1♀): *Chiapas*: Pichucalco Aug. 2♂, 1♀ AME; *Oaxaca*: Jaltepec Nov. 1♂ AME; Soyolapan el Bajo May 1♂ AMNH; *Veracruz*: Presidio Jul. 1♂ AME. **BELIZE** (1♂): no specific locality Sep. 1♂ BMB. **GUATEMALA** (3♂, 1♀): *Alta Verapaz*: Tamahú 1100m Nov. 1♀ AMNH; *Izabal*: Yzabal 1♂ BMNH; Barrios 1♂ BMB; *Not located*: no specific locality 1♂ BMNH. **HONDURAS** (1♂): *Cortés*: La Cumbre 1♂ BMNH. **NICARAGUA** (2♂, 2♀): *Chontales*: Chontales 2♂, 1♀ BMNH; *Zelaya Sur*: Nueva Guinea Oct. 1♀ AMNH. **COSTA RICA** (3♂, 5♀): *Cartago*: Moravia 3500' Aug. 1♂ USNM; *Puntarenas*: nr. Golfito 200m Aug. 1♂ KWJH; *San José*: Carrillo Feb. Apr. 2♀ BMNH, 1♀ USNM; San José 4000' 1♂, 1♀ USNM; *Not located*: no specific locality 1♀ ZMHU. **PANAMA** (11♂, 13♀): *Chiriquí*: Chiriquí 1♀ ZMHU; *Coclé*: El Copé 800m 1♀ USNM; El Valle Aug. 1♀ AME; *Colón*: Piña 1-200m Mar. Apr. Jul. Dec. 2♂, 3♀ FSCA, 2♂, 2♀ AME; *Darién*: Caña 1000-1200m Jul. Sep. 1♂, 1♀ USNM; *Panamá*: Cerro Azul Feb. Mar. 1♂ AME, 1♂ USNM; Cerro Campana 3000' Aug. Sep. 1♂, 3♀ USNM; Cerro Jefe 900m Apr. Nov. 2♂ USNM; *Not located*: no specific locality May Jul. 1♂, 1♀ FSCA.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá (de la Maza & de la Maza, 1993); Palenque; *Oaxaca*: Metates; *Veracruz*: Dos Amates; Uxpanapa (de la Maza, 1987); *San Luís Potosí*: Huichihuayan Sep. (Field, 1940b). **BELIZE**: *Cayo*: no specific locality (Davis, 1928); Mountain Pine Ridge 600-900m; upper Mullins River 240m (Meerman, 1999).

Adelpha demialba (Butler, 1872)

Figs. **70a,b**; 161a,b; 244a,b; *298*

Heterochroa demialba Butler (1872a: 77)

TL: Costa Rica. **Types**: **BMNH**(T): **ST**♀: "B.M. TYPE No. Rh. 9815 Heterochroa demialba ♀ Butl.// B.C.A. Lep. Rhop. Adelpha demialba Butl. Godman-Salvin Coll. 1916.-4.//Heterochroa demialba Butl. Type//♀//Costa Rica Van Patten Druce Coll.//Type H.T." [examined]

Adelpha demialba Butl., Kirby (1877)

Identification, taxonomy and variation:

This species cannot be confused with any other in the genus. It is the only species in which the submarginal series are expressed on the DFW anterior of vein M_3. There is little variation.

Butler's (1872a) description of this species, from a specimen or specimens in Druce's collection, is clear, and a syntype female is in the BMNH.

This is a highly distinctive species whose relationships within the genus are very difficult to ascertain. The male genitalia offer few clues, being similar to those of members of the *A. capucinus* group, but also to certain members of the *A. iphiclus* group, such as *A. plesaure* and *A. basiloides*. The adults have been recorded feeding on flowers, a behaviour frequently found in more primitive members of the genus. The wing pattern is so modified as to also be of little use in establishing phylogenetic relationships, and I have been unable to examine any immature stage material, although DeVries (1987) states that the pupa is morphologically similar to *A. lycorias melanthe*. To date, though, no members of the species group to which *A. lycorias* belongs have been recorded on Rubiaceae. Its systematic placement therefore remains uncertain.

Range: *Adelpha demialba* is known from Costa Rica to extreme eastern Panama, and although it has yet to be recorded in Colombia, it probably occurs there near the Panamanian border.

Immature stages: Haber (*In*: DeVries, 1986) reports a solitary late instar larva feeding on the young leaves of a plant at the forest edge. DeVries (1987) reports that the pupa is morphologically very similar to *A. lycorias melanthe*, but with silvery spotting on the wing pads. However, the male and female genitalia and wing pattern, and larval hostplant, show no close relationship to the *A. phylaca* group and the systematic position of this species remains enigmatic; unfortunately I have been unable to examine any early stage material.

Habitat and adult ecology: DeVries (1987) reports that this species occurs from 700-2300m on both Pacific and Atlantic slopes in Costa Rica, in association with cloud forest habitats. It is encountered as solitary individuals along landslips and water courses, where males puddle at water seepage, while females are typically encountered searching for oviposition sites around midday, along forest edges or roadsides. Both sexes visit flowers of *Mikania* and *Senecio megaphylla* (Asteraceae). Individuals fly in the early morning in sun until it clouds over or begins to rain, and although the species is typically uncommon, it can be fairly frequently encountered in small numbers in the dry season.

Specimens examined: 54 (21♂, 33♀)

COSTA RICA (11♂, 19♀): *Cartago*: Azahar de Cartago 5-6000' 1♀ BMNH; Cachí 1♂, 1♀ BMNH, 1♀ AME, 2♀ USNM; Las Cóncavas Dec. 1♂ AME; Irazú 6-7000' 3♀ BMNH; Juan Viñas Mar. Sep. Oct. 1♂ BMNH, 4♂ BMB; Tres Ríos 5000' Dec. 1♂ BMNH, 1♂ USNM; *Not located*: no specific locality 2♂, 5♀ BMNH, 2♀ ZMHU, 3♀ BMB, 1♀ MCZ. **PANAMA** (10♂, 7♀): *Chiriquí*: Boquete 1♀ BMNH; Bugaba 1♂ BMNH; Cerro Colorado 1450m Jul. 1♂ USNM; Cerro Hornito 1200m Jul. 1♀ USNM; Cerro Punta Jul. 1♂ AMNH; Chiriquí 2♂, 1♀ BMNH, 1♀ ZMHU; Valle de Chiriquí 3-4000' 1♀ BMNH; Volcán Barú 1300m Mar. 2♀ USNM; *Darién*: Caña 1500-1550m Apr. 2♂ USNM; *Veraguas*: Santa Fé Sep. 1♂ USNM; *Not located*: Alto Quiel 1800m Dec. 1♂ USNM; no specific locality 1♂ MNHN. **COUNTRY UNKNOWN** (7♀): no specific locality 7♀ BMNH.

Additional locality data: **PANAMA**: *Not located*: Peña Blanca (Godman & Salvin, 1884).

Adelpha epizygis Fruhstorfer, 1915

Figs. **71**; 162; 245; *299*

Identification, taxonomy and variation:

Adelpha epizygis is superficially similar to a number of sympatric species, but is distinguished by the pale VFW subapical marking being composed of the upper postdiscal band and the inner and outer postdiscal series. The upper postdiscal band and inner postdiscal series are separated by a dark, red-brown line, which tapers anteriorly, while the outer postdiscal series is visible as thin, convex dashes separated from the inner postdiscal series by red-brown dashes of similar width. The species is superficially most similar to *A. abia*, which has an even, rather than tapering, thin red-brown line separating the upper postdiscal band and inner postdiscal series, and a VHW which has a uniform red-brown ground colour, whereas the white postdiscal band in *A. epizygis* is immediately bordered by a dark brown line. In *A. abia*, the orange subapical marking on the DFW tapers gradually to border broadly along the costa, while in *A. epizygis* only the basal half of the band reaches the costa.

Although the dorsal surface is similar to several southeast Brazilian members of the *A. iphiclus* group, the orange DFW subapical marking is not formed entirely of the expanded postdiscal series, but through fusion of these with the upper postdiscal band, indicating that the similarity is due to convergence rather than close relationship. The male genitalia are similar to members of the *A. capucinus* group, with a long, square-tipped valva and numerous small distal spines, and I regard this species as a possible primitive member of this group. *Adelpha abia* has rather different male genitalia, and is probably more closely related to *A. heraclea* (see under *A. abia*).

Range and status: Coastal eastern to southeastern Brazil, westwards to northeastern Argentina and Paraguay. Rare, recorded to date from around 200-1100m.

Specimens examined: 21 (19♂, 2♀)

Adelpha epizygis epizygis Fruhstorfer, 1915

Figs. **71a,b**; 162a,b; 245a-c; *299*

Adelpha epizygis Fruhstorfer (1915: 527)

TL: São Paulo [Brazil]. **Types**: **BMNH**(M): **HT**?♂: "repaired with a bit of mincia//Brasilien São Paulo Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285"; **PT**?♂: "Rio Grande Brasil Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285"; **PT**?♂: "epizygis Fruhst.//Rio Grande Brasil Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285"; **BMNH**(T): **PT**?♂: "Fruhstorfer Coll. B.M. 1937-285//epizygis Fruhst.//Brasilien Rio Grande Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(R): **PT**♂: "Sapucay Paraguay 16.X.04 (W. Foster)//epizygis Fruhst." [all examined]

Identification, taxonomy and variation:

This subspecies is distinguished from *A. e. epona* by having an orange postdiscal marking in cell Cu_1-M_3 on the DFW that touches the white postdiscal spot, and usually extends as orange scaling into cell Cu_2-Cu_1. One male in the BMNH(R) has reduced orange in cell Cu_1-M_3 on the DFW and a small white block at the basal edge of the orange marking in cell M_3-M_2.

Fruhstorfer (1915) described this species based on a type from São Paulo and a male from Rio Grande do Sul in his own collection, and a male from Paraguay in the Tring Museum (now the BMNH(R)). As is typical of most Fruhstorfer types, there are no labels indicating unambiguously which specimens are types, and I therefore list several possible paratypes (Fig. 71a,b) from Rio Grande do Sul. However, all are referable to *A. e. epizygis*, and since the original description mentions several diagnostic characters of this taxon, including the touching orange and white postdiscal markings in cell Cu_1-M_3 on the DFW, and the illustration (Fruhstorfer, 1916: 109b) clearly shows the orange DFW subapical marking not extending completely to the costa (see identification of this species), there is no doubt as to its identity.

Range: Southeastern Brazil (São Paulo) to Uruguay, and west to northeastern Argentina and Paraguay.

Habitat and adult ecology: This subspecies is very rare in collections and little is known of its biology. Brown (1992) reports that it occurs in the Serra do Japi, São Paulo, in forest openings from 800m to above 1100m. Although the species is superficially very similar on the dorsal surface to a number of sympatric species, such as *A. falcipennis*, *A. poltius, A. gavina* and *A. calliphane*, this species belongs in a different species group and the similar orange DFW subapical marking is composed of different pattern elements, strongly suggesting wing pattern convergence through mimicry.

Specimens examined (17♂, 2♀):
BRAZIL (13♂, 1♀): *Paraná*: N. Paraná 1♀ AMNH; *Rio Grande do Sul*: Guaraní Jan. 1♂ MCZ; Rio Grande 3♂ BMNH; *Santa Catharina*: Trombudo Alto Jan. 1♂ AME; *São Paulo*: São Paulo 1♂ MCZ, 1♂ BMNH; *Not located*: Caryoa Mar. 1♂ BMB; Fazendo Caryoa Mar. 2♂ MCZ; no specific locality 2♂ MCZ, 1♂ BMNH. **PARAGUAY** (4♂, 1♀): *Alto Paraná*: Puerto Bertoni 1♂ BMB; *Caaguazu*: Yhú Dec. 1♂ BMNH; *Paraguarí*: Sapucay Oct. 1♂ BMNH; *Not located*: no specific locality 1♂, 1♀ BMNH.

Additional locality data: **BRAZIL**: *Minas Gerais*: Passa Quatro; *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *São Paulo*: Serra do Japi 800-1100m (Brown, 1992). **PARAGUAY**: *Guaíra* (Kochalka *et al*., 1996). **ARGENTINA**: *Misiones* (Hayward, 1951). **URUGUAY**: *Paysandú*: Paysandú Feb. Mar. (Biezanko *et al*., 1957).

Adelpha epizygis epona Fruhstorfer, 1915

Figs. **71c,d**; *299*

Adelpha epona Fruhstorfer (1915: 527)

TL: not stated. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//epona Fruhst.//Bahia Brasilia Fruhstorfer//TYPE//Type//Syntype" [examined]

Adelpha epizygis epona Fruhst., Hall (1938)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the absence of an orange postdiscal marking in cell Cu_1-M_3 on the DFW.

Fruhstorfer (1915) described this taxon as a distinct species, but noted at the same time that the ventral surface differed from *A. epizygis* only in being slightly more faded, and that the two might prove to be conspecific, an opinion shared by Hall (1938). No information was given on the type specimen or specimens, but a syntype (Fig. 71c,d) closely matching the description is in the BMNH and lacks an abdomen, indicating that it was probably dissected by Fruhstorfer. Although I have only examined two specimens of this taxon, I retain it as distinct from *A. e. epizygis* since both specimens are similar and differ consistently from all specimens that I have examined of the nominate subspecies.

Range: This subspecies is known only from two specimens, both from Bahia in eastern Brazil, although its range probably extends as far south as Espírito Santo.

Habitat and adult ecology: No observations have been reported on this very rare taxon.

Specimens examined (2♂):
BRAZIL (2♂): *Bahia*: Cachimbo 1♂ BMNH; Bahia 1♂ BMNH.

Adelpha fabricia Fruhstorfer, 1913

Figs. **72a,b**; 163a,b; 246a-c; *299*

Adelpha fabricia Fruhstorfer (1913: pl. 106d; 1915: 518)

TL: [Colombia]. **Types**: **BMNH**(T): **ST**♂: "Illustrated in the Butterflies of Venezuela, A. Neild 1996//88//euboea fabricia Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Columbien ex coll. H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**?♂: "Columbien ex coll. H. Fruhstorfer//fabricia Fruhst.//Fruhstorfer Coll. B.M. 1937-285" [both examined]

=*Adelpha euboea hilareia* Fruhstorfer (1915: 518) **stat. nov.**

TL: Peru. **OTL**: Tarapoto, Peru; Upper Amazon. **Types**: **BMNH**(T): **LT**♂: "euboea hilareia Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **PLT**♂: "Tefé, Amaz., November '07 (M. de Mathan)//Paratype//euboea hilareia Fruhst.//Fruhstorfer Coll. B.M. 1933-131" = *A. thesprotia* [both examined]

=*Adelpha euboea mamaea* Fruhstorfer (1915: 518) **syn. nov.**

TL: Mato Grosso [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Syntype ♂ Adelpha euboea mamaea Fruhstorfer G. Lamas det. 1987//Fruhstorfer Coll. B.M. 1937-285//Mato Grosso H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**♂: "Mato Grosso, H. Fruhstorfer//euboea mamaea Fruhst.//Paratype//Fruhstorfer Coll. B.M. 1937-285"; **ST**♂: "Mato Grosso, H. Fruhstorfer//TYPE//Paratype//Fruhstorfer Coll. B.M. 1937-285" [all examined]

Adelpha euboea fabricia Fruhst., Fruhstorfer (1915); *Adelpha euboea euboea* Fldr., Fruhstorfer (1915) misid.; *Adelpha thesprotia thesprotia* Fldr., Hall (1933, 1938) in part, misid.; *Adelpha thesprotia fabricia* Fruhst., Hall (1938); *Adelpha thesprotia mamaea* Fruhst., Hall (1938); *Adelpha fabricia* Frusht., Neild (1996)

Identification, taxonomy and variation:

Adelpha fabricia is similar to a large number of other species, particularly *A. capucinus*, but may be distinguished by the following combination of wing pattern characters: on the DFW, the orange subapical spot in cell M_2-M_1 is always absent or reduced in size compared with that in cell M_1-R_5 (in *A. capucinus* there is always an orange subapical spot in cell M_2-M_1 with the distal edge positioned in line with the distal edge of the band in cells Cu_1-M_3 and M_3-M_2, and this spot is of similar size or larger than that in cell M_1-R_5); the white DHW postdiscal band almost always has some thin greyish blue scaling along its basal edge; on the VFW, the inner and outer postdiscal series are both distinct and present as pale dashes just distal to the postdiscal band in cell Cu_2-Cu_1, with the more basal dash (the inner series) being much larger than the more distal, while the series are completely fused in cells Cu_1-M_3 and M_3-M_2 (in *A. capucinus* the inner postdiscal series in cell Cu_2-Cu_1 is present just as a small pale dot near vein Cu_1, or entirely absent); on the VHW, the silvery grey dashes of the inner postdiscal series are uniform throughout the wing (in *A. capucinus* they are more pronounced in cells M_1-Rs and Rs-Sc+R_1), and the ground colour is a rich reddish brown throughout (in *A. capucinus* the ground colour is dark brown immediately distal to the white postdiscal band). *Adelpha malea aethalia* has the silvery grey inner submarginal series on the VFW parallel to the distal margin and composed of evenly sized dashes in each cell, whereas in *A. fabricia* there is usually no dash in cell Cu_1-M_3 and only a trace in cell M_3-M_2, and that in cell Cu_1-M_3 is noticeably displaced basally. *Adelpha heraclea heraclea* has the orange on the DFW filling the very base of cell Cu_1-M_3, and the inner and outer postdiscal series on the VHW are much broader in cells M_1-Rs and Rs-Sc+R_1; the latter character also occurs in and distinguishes *A. atlantica* from *A. fabricia*. Remaining similar species typically have a well developed orange spot in cell M_2-M_1 on the DFW, and include: *A. thesprotia*, *A. erotia* and *A. messana*, all of which have the inner and outer postdiscal series fused to form a single, large pale spot distal to the postdiscal band in cell Cu_2-Cu_1 on the VFW; *A. boeotia*, which has a straight, vertical red-brown line separating the pale VFW postdiscal band from the inner postdiscal series; and *A. pollina*, which is distinguished by the silvery white VHW inner and outer postdiscal series uniting at the costa to form a single, anteriorly pointing V-shaped spot. Other less similar species are distinguished in the their respective accounts. There is slight variation in the thickness of the blue-grey scaling basal to the white DHW postdiscal band, which is absent in the few female specimens that I have examined, and the presence or absence of an orange DFW subapical spot in cell M_2-M_1. In the three male specimens from western Ecuador the white DHW postdiscal band tends to be slightly narrower, with heavier blue-grey scaling at both the distal and basal edges of the band, the pale spots of the postdiscal series on the VFW in cells Cu_2-Cu_1, Cu_1-M_3 and M_3-M_2 are heavily obscured by red-brown scaling and the inner postdiscal series on the VFW tends to be broader and less well defined. Since there is probably little gene flow between east and west these specimens are isolated from the typical population they may well represent a distinct subspecies, but more material is needed, particularly from western Colombia, to establish the consistency of these slight differences.

Fruhstorfer (1915) was the first to realise that this phenotype represented a distinct species, although he mistakenly treated it under the name *Adelpha euboea*, which is in fact a synonym of *A. plesaure phliassa*. He mentions two distinctive characters of the species, the blue-grey scaling bordering the basal edge of the white DHW postdiscal band, and the bright, purplish brown ventral coloration, and described three subspecies, all of which supposedly differed from each other in the shape of the orange DFW band and hue of the ventral surface. *Adelpha fabricia* was figured on plate 106c as a full species (Fruhstorfer, 1913), and Fruhstorfer (1915) went on to place it as a subspecies of "*A. euboea*" and say that the name was based on an unspecified number of specimens lacking exact locality data from Colombia. There are two syntype specimens in the BMNH and both represent this taxon, although the type illustration shows a specimen with an orange DFW subapical spot in cell M_2-M_1, which is absent in the specimen in the type collection. The syntype in the type collection (Fig. 72a,b) has relatively heavy blue-grey scaling basal of the white DHW postdiscal band, and a broad inner postdiscal series on the VHW, both characters seen in the western Ecuadorian specimens discussed above, and it is possible that it was collected west of the Colombian Cordillera Oriental. *Adelpha euboea hilareia* was described from specimens from Tarapoto in Peru and the Upper Amazon (Fruhstorfer, 1915), and I have examined two syntypes in the BMNH. The Brazilian specimen is actually *A. thesprotia*, while the Peruvian specimen represents this taxon, and I therefore designate the latter specimen with the following data as the lectotype of *Adelpha euboea hilareia*: "euboea hilareia Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//TYPE//Type//Syntype". The lectotype differs from Colombian specimens only in having slightly reduced blue-grey scaling basal of the white DHW postdiscal band and slightly less red-brown scaling in the VFW pale postdiscal band, both variable characters, and I therefore synonymise *hilareia* with *fabricia* (**stat. nov.** - Hall (1938) placed the name as a synonym of *A. thesprotia*). Finally, *A. euboea mamaea* was described from an unspecified number of specimens from Mato Grosso, and I have examined several syntypes. These scarcely differ from the nominate syntypes in having a slightly darker VHW, and I therefore synonymise *mamaea* with *fabricia* (**syn. nov.**).

Hall (1938) treated *fabricia* and its synonyms under the name "*A. thesprotia*", by which he was referring to *A. capucinus*, and it was Neild (1996) who re-established the species and correctly resurrected the name *fabricia* from subspecific combination with *A. thesprotia*. The male genitalia confirm that this species is most closely related to *A. capucinus* and *A. barnesia*, the distal tip of the valva being sharply squared off with posteriorly pointing spines. *Adelpha thesprotia* and related species have the distal tip of the valva tapering and rounded, with distal spines that also extend anteriorly along the ventral surface of the valva, the clunicula is broader and shorter and the saccus is relatively longer, almost equal in length to the valva.

Range: *Adelpha fabricia* is known east of the Andes from southern Venezuela to Bolivia, the central Amazon basin in Brazil, and from a single specimen from Guyana. Several specimens have also been collected in northwestern Ecuador, but the species is otherwise unrecorded throughout central and western Colombia.

Habitat and adult ecology: This species appears to be rare throughout its range, and in my experience in Ecuador, it is most commonly encountered during the wet season to early dry season. In both eastern and western Ecuador I have collected it at a number of sites, all of which are ridge tops in primary, wet lowland rain forest below 1000m. All of the males that I have seen have been attracted to rotting fish in subcanopy traps in forest light gaps, usually in the late morning to early afternoon, while the single female was flying along a path lined with extensive secondary growth in the early afternoon.

Specimens examined: 67 (64♂, 3♀)

VENEZUELA (1♂): *Amazonas*: Mt. Duida 1♂ AMNH. **COLOMBIA** (13♂, 1♀): *Cundinamarca*: Bogotá 7♂ BMNH, 1♂ BMB, 1♂ USNM; Cananche Sep. 2♂ BMNH; *Not located*: no specific locality 2♂ BMNH, 1♀ AMNH. **ECUADOR** (6♂, 1♀): *Emeraldas*: El Durango 400m Jul. 1♀ KWJH; El Encanto, km 16 Lita-San Lorenzo rd. 900m Jul. 1♂ KWJH; San Lorenzo-Lita rd., km 20, 150m Aug. 2♂ KWJH; *Napo*: Chichicorrumi 450m Jul. 1♂ KWJH; Río Tiputini 300m Sep. 1♂ KWJH; *Pastaza*: Pitirishca 1000m Jul. 1♂ KWJH. **PERU** (27♂): *Amazonas*: Río Santiago Sep. 1♂ AMNH; *Huánuco*: Tingo María May Jul. 2♂ AME; *Junín*: Satipo Oct. 1♂ AME; *Loreto*: Iquitos Sep. Nov. 2♂ BMNH, 2♂ AMNH; Pebas Jan. 1♂ BMNH; Río Sucusari 140m Sep. 2♂ MUSM; *Madre de Dios*: Boca Río La Torre 300m Sep. 2♂ MUSM; Pakitza 340-400m May Oct. 3♂ MUSM; Shintuya 460m Jul. 1♂ AME; Puerto Maldonado, 30 km S.W., Oct. 4♂ USNM; *Puno*: Chaquimayo Apr. 2500' 1♂ BMNH; La Unión 2000' 2♂ BMNH; Río Távara 750m Aug. 1♂ MUSM; *Not located*: Río Ucayali 1♂ BMNH; no specific locality 1♂ BMNH. **BOLIVIA** (2♂): *Santa Cruz*: Río Juntas 1000m 1♂ ZMHU; *Not located*: no specific locality 1♂ BMNH. **BRAZIL** (15♂): *Amazonas*: lower Rio Madeira Jul.-Sep. 1♂ BMNH; Madeira 1♂ USNM; Manicoré Aug. 1♂ ZMHU, 1♂ AME; Rio Caiary-Vaupés Aug. Sep. 2♂ AMNH; Rio Purus 1♂ MNHN; São Paulo de Olivença 2♂ BMNH, 2♂ ZMHU; *Mato Grosso*: no specific locality 3♂ BMNH; *Pará*: Cuiabá-Santarém, km 715, Jul. 1♂ USNM. **GUYANA** (1♀): *Not located*: Río Demerara 1♀ BMNH.

Additional locality data: **ECUADOR**: *Napo*: Apuya Oct. Dec.; Tiguino Oct.; Tiputini Biodiversity Station 300m Aug. (Willmott & Hall, sight records).

Adelpha capucinus (Walch, 1775)

Figs. 6d,f,j,l,n,9,17,19; **73**; 164; 247; *299*

Identification, taxonomy and variation:

This species is distinguished from similar and related species, except for *A. barnesia* and *A. diazi*, by having the inner and outer postdiscal series in cell Cu_2-Cu_1 on the VFW separate, instead of coalesced to form a single large pale spot, with the inner series reduced to a small spot in the anterior half of the cell or entirely absent. Cell M_2-M_1 on the DFW has an orange subapical spot of equal size or greater to that in cell M_1-R_5, with the distal edge of the spot in cell M_2-M_1 aligned with the distal edge of the marking in cell M_3-M_2. *Adelpha barnesia* and *A. diazi* typically have the inner postdiscal series in cell Cu_2-Cu_1 on the VFW of similar length to the outer postdiscal series, although sometimes these markings are faded and difficult to see, and they can also be distinguished by the orange DFW subapical marking never touching the white postdiscal spot in cell Cu_2-Cu_1 on the DFW. Additional characters to distinguish *A. capucinus* from *A. fabricia* are given under the latter species. There is continuous variation within populations in the amount of white over the DFW postdiscal band between the anal margin and the middle of cell Cu_2-Cu_1, with some specimens having the band entirely orange. There is also geographic variation in the presence or absence of an orange band distal to the white DHW postdiscal band, and in the colour of the ventral surface and expression of the VHW submarginal series, and three subspecies are recognised.

This species has historically been one of the most confused and frequently misidentified, and Neild (1996) was the first author to provide comprehensive details on its identification. Despite being superficially very similar to *A. thesprotia*, the male genitalia and ventral surface wing pattern characters show it to belong to a group of species that includes at least *A. barnesia*, *A. fabricia* and *A. diazi*. Among this group, the similar configuration of the orange subapical spot on the DFW in cell M_2-M_1 places this species as the sister species to *A. barnesia/diazi*.

Range and status: East of the Andes from Venezuela to Bolivia, Brazil and the Guianas. Unrecorded from Paraguay and northeastern Argentina but expected to occur there. Common in lowland rain forest from sea level to 1300m.

Specimens examined: 431 (339♂, 92♀)

Adelpha capucinus capucinus (Walch, 1775)

Figs. 6d,f,j,l,n,9,17,19; **73a-f**; 164a,b; 247a,b; *299*

Papilio capucinus Walch (1775: 129, pl. VI, fig. 2a,b)

TL: Amazons. **OTL**: Ostindien. **Types**: **BMNH**(M): **NT**♂: "Amazons. Hewitson Coll. 79-69 Heterochroa erotia. 2.//amaz.[glued to back]" [examined]

=*Adelpha juruana* Butler (1877a: 115) **stat. nov.**

TL: Lago cerrado, Río Juruá, Brazil; E. Peru. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9828 Adelpha juruana ♂ Butl.//Lago Cerrado R. Juruá 30.10.74 Traill Coll. 77 65//Type//Syntype"; **BMNH**(M): **ST**♂: "E. Peru 69 60//Paratype//B.M. TYPE No. Rh. 9829 Adelpha juruana ♂ Butl.//Illustrated in the Butterflies of Venezuela A. Neild, 1996//92" [both examined]

=*Adelpha phylacides* Fruhstorfer (1913: pl. 106f; 1915: 520) **stat. nov.**

TL: [Alto Amazonas, Peru; central Amazon]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//phylaca phylacides Fruhst.//Peru H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(R); **ST**♂: "phylaca phylacides Fruhst.//Humayta Río Madeira VII-IX. 1906 (W. Hoffmanns)//R" [both examined]

=*Adelpha phylaca georgias* Fruhstorfer (1915: 520) **stat. nov.**

TL: Mato Grosso, Brazil. **Types**: **BMNH**(T): **ST**♂: "phylaca georgias Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Mato Grosso H. Fruhstorfer// TYPE//Type//Syntype" [examined]

=*Papilio iphiclus* Linn., Herbst (1793: 138); *Adelpha capucinus* Walch, Kirby (1871); *Adelpha thesprotia thesprotia* Fldr., Hall (1933, 1938) in part, misid.; *Adelpha thesprotia* Fldr., D'Abrera (1987) misid.; *Adelpa juruana* Butl., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. c. velia* by the thinner and better defined silvery grey inner and outer submarginal series on the VHW, the darker reddish ventral coloration and the more extensive orange on the DFW. *Adelpha c. velia* always has the orange of the DFW subapical marking only touching the white postdiscal marking in cell Cu_2-Cu_1 at the distal corner of this marking, whereas in *A. c. capucinus* the orange extends right across the margin to its basal edge. *Adelpha c. capucinus* typically has the distal edge of the white DHW postdiscal band straight or convex, whereas in *A. c. velia* it is usually concave. The nominate subspecies is continuously variable on the DFW, from individuals that have the entire postdiscal band orange (Fig. 73c), to individuals where the postdiscal band is white to the midpoint of cell Cu_2-Cu_1 (Fig. 73e). The white form is typically slightly more common, but entirely orange forms occur throughout the range, and females are usually of the orange form. The orange subapical markings in cell M_2-M_1 and M_1-R_5 are variable in size, and that in cell M_2-M_1 may be isolated from the orange marking in cell M_3-M_2, or fused with it along vein M_2. There is slight variation in the spacing of the postdiscal and submarginal series on the VHW, and thus the width of the dark bands between them.

This taxon is very similar to many other Amazonian species and has had a confused taxonomic history. Walch (1775) described *Papilio capucinus* based on an unspecified number of specimens from "Ostindien", and figured the dorsal and ventral surface of both wings in colour (Fig. 73a,b). Unfortunately, these figures are very poorly drawn, but the species is clearly an "orange and white banded" *Adelpha*. The name appears almost never to have been mentioned in the literature, except by Herbst (1793), who listed it as a synonym of *Papilio iphiclus*, which he regarded as representing *Adelpha serpa diadochus*, and Kirby (1871), who placed it in his list just before *Adelpha cocala*. No type specimens are known to exist; Horn & Kahle (1935-37) do not list Walch or his collection, and Gerardo Lamas (pers. comm) and Robert Robbins (pers. comm.) inform me that the whereabouts of none of his types is known. I believe, however, that there is sufficient detail in the illustration to identify to which species it refers (Fig. 73a,b). Although it is unclear whether the DFW postdiscal band has any white at the anal margin, this band has several notable features; the orange subapical spot in cell M_2-M_1 is connected to the marking in cell M_3-M_2, and also to the upper postdiscal band in cell M_2-M_1 along vein M_2, the distal margin of this spot is aligned with the distal margin of the band in cells Cu_1-M_3 and M_3-M_2, and the basal edge of the band is approximately straight. On the VFW, the postdiscal band and postdiscal series are completely fused, lacking any dividing red-brown line, and seem to taper from cell Cu_1-M_3 to cell Cu_2-Cu_1. The presence of a pronounced orange subapical spot in cell M_2-M_1 on the DFW eliminates *A. malea aethalia*, *A. heraclea* and *A. fabricia*, while the position of the spot, aligned with the distal margin of the marking in cell M_3-M_2, eliminates *A. erotia*, *A. thesprotia*, *A. phylaca*, *A. delinita*, *A. boeotia*, *A. messana* and *A. pollina*. The only other species which is similar on the DFW to this illustration is *A. cocala*, which, however, lacks an orange spot in the DHW tornus. Furthermore, *A. capucinus* and *A. cocala* clearly differ on the VFW in the former having a uniform, undivided pale postdiscal band, as is the case in the illustration, and so *A. cocala* must be eliminated. The apparently tapering band on the VFW also matches *A. capucinus* as treated here, and specimens from certain areas have the orange subapical spot in cell M_2-M_1 on the DFW joined to the upper postdiscal band, an unusual character in *Adelpha* (see Fig. 73c). I therefore conclude that the name *capucinus* can only apply to this taxon. In the absence of any type specimens, and to ensure future nomenclatural stability, I designate a male specimen in the BMNH(M) with the following label data as the neotype of *Papilio capucinus* (my words in square parentheses): "Amazons. Hewitson Coll. 79-69 Heterochroa erotia. 2.//amaz.[glued to back]" (Fig. 73c,d). The original type locality is, of course, unknown, but it is most likely to have been the northeastern coast of South America, whence originated most eighteenth century specimens of *Adelpha* (Vane-Wright, 1975), and I have selected a specimen from as near to this region as possible, that is phenotypically similar to the original illustration, in good condition and otherwise typical of the species.

Although the name *capucinus* has almost never been used, there is no major disruption to nomenclatural stability since Neild (1996) is the only author ever to have used as the species name for this taxon one that was potentially applicable. In any case, I consider the Amazonian and southeast Brazilian populations as conspecific, and the name *velia* would have had precedence over *juruana* as used by Neild, if the name *capucinus* were not applied as it is here. Fruhstorfer (1915) treated this taxon as a subspecies of *A. phylaca*, while the majority of other authors treated it as *A. thesprotia*, until Moss (1933) showed that the early stages of *A. thesprotia* and *A. capucinus* were distinct. Hall (1938) realised that *A. capucinus* and *A. thesprotia* could be distinguished by means of the postdiscal markings in cell Cu_2-Cu_1 on the VFW, but, despite having examined the syntype of

A. thesprotia, applied the name *thesprotia* to *A. capucinus* and *delphicola* to true *A. thesprotia* (see Neild, 1996). Hall (1938) therefore placed *juruana*, described by Butler (1877a), as a synonym of *A. thesprotia*. Both of Butler's syntypes of *juruana* are in the BMNH and one was figured by Neild (1996), and both have the DFW postdiscal band white to the middle of cell Cu_2-Cu_1, but since the extent of orange is individually variable I synonymise *juruana* with *capucinus* (**stat. nov.**). Fruhstorfer (1913) appears to have been unaware of the name *juruana*, since he figured a specimen under a new name, *phylacides*, later placed as a subspecies of *A. phylaca* (Fruhstorfer, 1915), which differs from *juruana* only in having slightly less heavy orange on the DFW, and Hall (1938) synonymised the two names. Two syntypes of *phylacides* are in the BMNH (Fig. 73e,f) and both represent the white form of *A. capucinus*, with which I synonymise the name (**stat. nov.**). Fruhstorfer (1915) described a further taxon, *georgias*, from a specimen or specimens from Mato Grosso and a syntype is in the BMNH. This specimen is the typical white form of *A. capucinus*, and the faded ventral surface is either due to seasonal effects or to slight intergradation with *A. capucinus velia*. I therefore also synonymise *georgias* with *A. capucinus* (**syn. nov.**).

Range: East of the Andes from Venezuela to Bolivia, throughout the Brazilian Amazon and in the Guianas.

Immature stages: Moss (1933) reared this species in Pará, Brazil, and reported the early stage information under the name *A. thesprotia*. Fortunately, his voucher specimens are in the BMNH and show it to be *A. capucinus capucinus*. He found the larvae on an unidentified plant which he called "false cacao", and stated that this was a "twiner growing only in clayey soil in the heavy shade of *Theobroma* and other trees... Begins life as a separate bush, with no appearance of being a climber; later throws out long tendrils, and probably only flowers on crown of other trees at 40 or 50 feet elevation. Leaves smooth, deep green, oval, alternate and deceptively like those of cacao but smaller". The alternate leaves exclude Malpighiaceae, the probable hostplant family of *A. capucinus velia*, as a possible family for this plant (Gentry, 1993). Moss (1933) reported that the early instars are dark brown, the third instar has the middle of the dorsal area light brown, the fourth instar has the scoli more developed, while the fifth instar (figured by Moss, pl. II, fig. 13) is entirely grey with very numerous, relatively short, densely spined scoli. The lateral spines on the scoli are distinctive in being swollen just beyond the base, then tapering sharply (Figs. 6d,f,j,l,n). The head capsule has all the chalazae series relatively well-developed (Fig. 9). The pupa is "splashed with gold" and has relatively short projections on A2 and T2, with leaf-shaped, laterally pointing head horns (Figs. 17, 19) (see also Moss, pl II, fig. 4).

Early instars, as in all other *Adelpha*, rest on the extended leaf midrib, while the last instar rests in a curled position (shown in Moss' figure). The larvae typically occur on small plants near the ground in heavy shade. According to Moss, of all the *Adelpha* that he reared in Pará this species was most commonly parasitised by Hymenoptera.

Habitat and adult ecology: This is one of the most common forest *Adelpha* species, occurring in rain forest in varying degrees of disturbance up to 1300m. Males are typically encountered in forest light gaps where they may be attracted to rotting fish. Males also may rarely be found perching in large forest clearings along streams on the tops of bushes 3-4m above the ground, in the afternoon in bright sun. Females are significantly rarer than males, and the only individual I have seen in nature was flying in a large light gap in secondary forest, in the middle of the morning. The two forms of this subspecies, between which there exist complete intergrades, may be maintained through mimicry of other sympatric *Adelpha* species.

Specimens examined (307♂, 67♀):
"**MEXICO**" (1♂): *Oaxaca*: La Esperanza native collectors 1♂ AME-error. **VENEZUELA** (2♂, 4♀): *Amazonas*: Raudal Salas, Alto Orinoco Aug. 1♂ USNM; Río Mavaca Mar. 1♂ AMNH; San Carlos de Río Negro to Solano 100m Mar. 1♀ AFEN; *Bolívar*: El Dorado 900m Oct. 1♀ FSCA; Javillal 100m Aug. 1♀ AFEN; Salto Pará, mid Caura 150m Aug. 1♀ AFEN. **COLOMBIA** (18♂, 1♀): *Amazonas*: Florida Sep. Dec. 3♂ BMNH; Puerto Nariño Dec. 1♂ LMC; *Caquetá*: Río Bodoquero Jan. 2♂ USNM; *Cundinamarca*: Bogotá 1♂ BMNH, 1♂ BMB, 1♂ USNM; *Meta*: Remolinos Aug. Oct. 1♂, 1♀ JFL; Río Negro May 1♂ ESM; *Putumayo*: Umbría 1♂ AMNH; *Not located*: "N.E. Peru 6186 Bassler" 1♂ AMNH; Pipiral 1♂ MNHN; no specific locality 2♂ USNM, 1♂ BMB, 1♂ MCZ. **ECUADOR** (25♂, 3♀): *Morona-Santiago*: Bomboiza May Jul. Nov. 5♂ KWJH, 1♂ DAT; *Napo*: Apuya 600m May 1♂ KWJH; Chichicorrumi Feb. 1♂ KWJH; nr. Coca 300m Aug. 1♀ KWJH; Coca, 35 km S.W., Apr. 1♂ MJP; Las Minas de Misahuallí Jul. 1♂ KWJH; Pimpilala 600m Sep. 1♂ KWJH; Río Chalayacu Sep. 1♂ DAT; Río Napo 1♂ MNHN; Río Tiputini Mar. Jul. 2♂ KWJH; Talag Sep. 1♂ DAT; *Pastaza*: Hda. Moravia 1200m Feb. 1♂ KWJH; Sarayacu 1♂ USNM; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Mar. Aug. Oct. 3♂, 2♀ PJD; *Not located*: E. Ecuador 1♂ USNM; no specific locality 1♂ BMB, 2♂ JFL. **PERU** (165♂, 12♀): *Amazonas*: Falso Paquisha 800m Oct. 1♂ MUSM; Rentema Falls 1000' 1♂ BMNH; Río Santiago Jul. Aug. Oct. Nov. 4♂ AMNH; *Cuzco*: Cuzco 2-3000m 1♂ BMB; *Huánuco*: Cord. del Sira 800m Aug. Sep. 1♀ MUSM; Puerto Inca 1♂ MUSM; Tingo María Mar. Dec. 1♂ FSCA, 7♂ AME; *Junín*: Chanchamayo 4♂ BMNH, 1♂ ZMHU, 1♂ AME, 1♂ BMB, 2♂ USNM; Guaya Pichis Feb. 1♂ AME; Ipokiari, Río Ipoki May 1♂ MUSM; La Merced 2500' Apr. Jun. 1♂ BMNH, 11♂ BMB; Perené Dist. 3♂ BMNH; Satipo Oct. Nov. 7♂ AMNH, 1♂ BMNH, 5♂ AME; *Loreto*: Contanamá Oct.-Dec. BMNH; El Fuerte, Cerros del Orellana 150m Jul. 1♂ MUSM; Iquitos Mar. Jun.-Aug. 6♂ AMNH, 6♂ BMNH, 4♂ ZMHU, 1♂, 1♀ AME, 2♂ MUSM; Iquitos-Nauta, km 15, 120m Aug. 2♂ MUSM; Pebas Oct. 5♂ BMNH, 4♂ ZMHU, 1♂ MCZ; Río Sucusari 140m Sep. 8♂, 1♀ MUSM; San Roque 1♂ AME; Sarayacu 1♀ ZMHU; upper Río Tapiche Jan. 1♂ AMNH; Yanamono 120m Jul. 1♂ MUSM; Yurimaguas 2♂ ZMHU; *Madre de Dios*: Boca Río La Torre May Aug. Sep. 300m 12♂, 2♀ MUSM; Pakitza 340-400m Apr. Sep. 8♂, 2♀ MUSM; Pampas del Heath 220m Jun. 1♂ MUSM; Puerto Maldonado 250m Aug. Oct. 3♂ AME, 1♂ USNM; Puerto Maldonado, 15 km N.E., 200m Jun. 1♂ MUSM; Shintuya 460m Jul. 2♂ AME; *Pasco*: Oxapampa 1♂ MUSM; Pichis rd. Feb. 1♂ BMNH, 1♂ BMB; Pozuzo 3♂ BMB; Río Chuchurras 320m 1♂ BMNH; *Puno*: La Unión 2000' Nov. 1♂ BMNH; Río Távara 450m Jul. 1♂ MUSM; Yahuarmayo 1200' Apr. May 1♂ BMB; *San Martín*: Jepelacio 1100m May 13♂, 1♀ AMNH, 1♂ AME; Juanjuí 1♂ USNM; Tarapoto 2♀ BMNH; *Ucayali*: Boquerón Abad Mar. Nov. 1♂ AME, 1♂ MUSM; *Not located*: Huallaga 4♂, 1♀ AMNH; Río Ucayali 1♂ BMNH; no specific locality 3♂ BMNH, 1♂ BMB, 1♂ MCZ. **BOLIVIA** (16♂, 1♀): *El Beni*: Cachuela Esperanza Sep. 1♂ AME; *La Paz*: Coroico Mar. 1♂ AMNH; Guanay Oct. 1♂ JFL; Río Chimato Apr. 1♂ AMNH; Río Songo 1200m 1♂ ZMHU, 1♂ USNM; Río Suapi 1000m 2♂ ZMHU; Sorata 1♂ MCZ; *Santa Cruz*: Buenavista 750m Aug.-Apr. 1♀ BMNH; Prov. Sara Feb. Mar. 2♂ BMNH; Río Negro Aug. 1♂ AME; Santa Cruz Dec. 1♂ BMB, 1♂ AMNH; *Not located*: no specific locality 1♂ BMNH, 1♂ ZMHU. **BRAZIL** (59♂, 32♀): *Amazonas*: Ega 3♂, 1♀ BMNH; Fonte Boa Jul.-Aug. 2♂ BMNH; Humaitá Jun.-Sep. 1♂ BMNH; Lago Cerrado, Rio Juruá Oct. 1♂ BMNH; lower Rio Madeira Jul.-Sep. 1♂ BMNH; Madeira 1♂ AMNH; Manaus 1♀ BMNH, 1♂, 1♀ ZMHU; Maués, Laginho Jul. 2♀ BMNH; Rio Caiary-Vaupés Sep. 1♂ AMNH; Rio Madeira 1♂ BMNH; Rio Purus 1♂ MNHN; São Paulo de Olivença 4♂ BMNH, 5♂, 1♀ ZMHU; Tefé Oct. 6♂ BMNH, 1♂ AMNH; Thamar, Rio Negro 1♀ ZMHU; *Mato Grosso*: Buriti May 1♂ USNM; river system Cuyabá-Corumbá 1♂ BMNH; no specific locality 1♂ BMNH; *Pará*: Cuiabá-Santarém, km 958, Jul. 1♂ USNM; Itaituba 3♂ ZMHU; Óbidos 5♂, 1♀ AMNH, 1♂, 1♀ BMNH; Pará 5♂, 22♀ BMNH; Villa Nova 1♀ BMNH; *Rondônia*: Cacaulândia Apr. Oct. Nov. 8♂ AME, 2♂ USNM; Jaru Mar. Aug. 2♂ AME. **GUYANA** (2♂, 5♀): *Cuyuni/Mazaruni*: Kalacoon, Bartica Oct. 1♀ AMNH; Takutu River 1♀ BMNH; *East Berbice/Courantyne*: New River Triangle, Berbice 500m Oct. 1♂ BMNH, 1♂, 2♀ AME; *Not located*: Friendship, Berbice R. Jul. 1♀ BMB. **FRENCH GUIANA** (4♂, 7♀): *Cayenne*: Cayenne 1♀ MNHN, 1♀ USNM; *Laurent du Maroni*: St. Jean du Maroni 1♂ BMNH; St. Laurent du Maroni Jul.-Sep. 1♂, 1♀ BMB, 1♀ BMNH; Saül Dec. 1♀ USNM; *Not located*: no specific locality 1♀ BMNH, 1♂ BMB, 1♀ MNHN, 1♂ USNM. **SURINAM** (1♂, 1♀): *Para*: Para District Nov. 1♂ BMB; *Not located*: no specific locality 1♀ ZMHU. **COUNTRY UNKNOWN** (13♂, 1♀): Amazons 2♂ BMNH, 1♂ USNM; Amaz. S. 1♂ BMNH; U. Amazon 1♂ BMNH, 1♂ BMB; no specific locality 4♂ MCZ, 1♀ BMNH, 1♂ AME, 1♂ MNHN, 1♂ AMNH.

Additional locality data: **ECUADOR**: *Napo*: Apuya Jun.-Oct.; Capirón Jul.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Jul. Sep. Oct. Dec.; Finca San Carlo Sep. Dec.; Satzayacu Sep.; Tena-Loreto rd., km 49, 1300m Mar.; Tiputini Biodiversity Station 300m Aug.; Yarina Jul.; Yasuní 300m Aug.; *Pastaza*: Pitirishca Jul.; *Sucumbíos*: Pañacocha Oct. (Willmott & Hall, sight records). **BRAZIL**: *Amazonas*: Ilha de Maracá (Mielke & Casagrande, [1992]).

Adelpha capucinus velia (C. & R. Felder, 1867) **stat. nov.**

Figs. **73g,h**; *299*

Heterochroa velia C. & R. Felder (1867: 423)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♀: “Syntype//Type//Bogotá Lindig Type//Felder Colln.//velia n.//velia Felder// Heterochroa velia C. & R. Felder, ♀ syntype det. R.I. Vane-Wright 1983” [examined]

=*Adelpha velia veliada* Fruhstorfer (1915: 526)

TL: Santa Catharina; Espírito Santo [Brazil]. **Types**: **BMNH**(M): **ST**♀: “Spec. Leop.//Espírito Santo Brasil ex Coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285”; **ST**♀: “Brasilien, Blumenau, Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//TYPE//Syntype//velia veliada Fruhst.” [both examined]

Adelpha velia Fldr., Kirby (1871); *Adelpha velia* Fldr., D’Abrera (1987)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account. There is some variation in the ground colour of the VHW, which may be reddish brown or, more rarely, purplish brown. Unlike the nominate subspecies, there is little variation in the coloration of the DFW postdiscal band.

Felder & Felder (1867) described this taxon from a female specimen or specimens supposedly from Bogotá, comparing it to *A. plesaure plesaure*, and stated that it differed by the orange DFW postdiscal band being “forked” with the outer branch ending with two orange subapical spots. A syntype in the BMNH closely matches this description. Fruhstorfer (1915) described *veliada* as a subspecies of this taxon, based on two females from Santa Catharina and one female from Espírito Santo. I have located two syntypes, while the putative male and female syntypes in the BMNH(T), are not true syntypes since they are labelled as from “Rio”. None of the differences mentioned by Fruhstorfer as distinguishing *veliada* from *velia* is anything more than individual variation, and Hall (1938) correctly synonymised the two names.

This taxon was regarded as a full species by Fruhstorfer (1915), partly due to the mislabelling of the syntype of *velia* from Bogotá, which implied a broad Amazonian range. Hall (1938) also treated it as a distinct species, stating that there were specimens in the BMNH from Pebas. There are indeed three males and a female, all from the collection of Fruhstorfer, supposedly from Pebas, but these are clearly also mislabelled. The taxon *velia* has all of the diagnostic characters of this species, is closely allopatric and the genitalia do not differ from Amazonian specimens, so I place it as a subspecies of *A. capucinus* (**stat. nov.**).

Range: This subspecies is known from eastern Bolivia to southeastern Brazil, as far south as Santa Catharina, although it has yet to be reported from either Paraguay or Argentina.

Immature stages: Müller (1886) reared a species in Santa Catharina, Brazil, which he identified as “*erotia* var.”. Since *A. erotia* is extremely rare in southeastern Brazil, only being known as the form “lerna”, and Müller failed to mention the pronounced dorsal pupal “hook” possessed by *A. erotia* (and also *A. thesprotia*), the most plausible species that Müller could be referring as “*erotia* var.” is *A. capucinus velia*. The reported hostplant is *Tetrapterys* sp. (Malphigiaceae), a family otherwise unrecorded for the *A. phylaca* group of which both *A. thesprotia* and *A. erotia* are members. The mature larva is distinctive in having numerous short, randomly distributed spines on the scolus of T2, which was figured on Taf. 2, fig. 8a, the spines being swollen just beyond the base of each and tapering sharply at the tip. Aiello (1984) regarded this figure as representing a scolus of a species of the *A. serpa* group, but the spines are not arranged in a single plane, and an examination of the preserved larva of *A. capucinus capucinus*, reared by Moss (1933) in Brazil, shows that the latter also has a very similar T2 scolus (Fig. 6d). The head of the last instar is pale brown and the dorsal surface is black from T1 to A3. The pupa apparently lacks a strong dorsal projection (Müller did not specify this, but he did say that the only species he reared in which the pupal projection approached that of *A. lycorias* was *A. mythra*) and has small projections in the same position as the last instar larval scoli on segments A3 and A4. The pupa apparently bends towards and away from light, alternately.

Habitat and adult ecology: This subspecies appears to be uncommon and there are no published observations of its natural history. The phenotypic stability of the dorsal forewing band is probably due the possession of a similar pattern by the majority of other sympatric *Adelpha* taxa.

Specimens examined (29♂, 25♀):

“**COLOMBIA**” (1♀): *Cundinamarca*: Bogotá 1♀ BMNH-error. “**PERU**” (4♂, 1♀): *Junín*: Chanchamayo 1♂ ZMHU-error; *Loreto*: Pebas (ex coll Fruhstorfer) 3♂, 1♀ BMNH-error. **BOLIVIA** (1♀): *Santa Cruz*: Río Juntas 300m 1♀ ZMHU. **BRAZIL** (23♂, 22♀): *Espírito Santo*: Itaguassu Sep. 1♂, 1♀ AME; Linhares May Jun.-Sep. 3♂, 4♀ AME; no specific locality 1♀ BMNH; *Mato Grosso*: no specific locality 1♂ USNM; *Minas Gerais*: Leopoldina 2♀ ZMHU; Parque Rio Doce 1♂ AME; San Jacinto Valley 1♀ BMNH; *Rio de Janeiro*: Itabapoana 1♂ MCZ; Porto Velho 1♂ USNM; Rio de Janeiro Aug. Sep. 1♀ AMNH, 1♂, 1♀ MCZ, 1♂ USNM; Restinga Jacarepaguá Jul. Sep. 1♂, 2♀ AME; Rio 2♂, 3♀ BMNH, 3♂, 2♀ ZMHU; *Santa Catharina*: Blumenau 1♂, 1♀ BMNH, 2♂ ZMHU; no specific locality 1♀ AMNH; *São Paulo*: Casa Branca 3♂ ZMHU; *Not located*: no specific locality 1♂ ZMHU, 1♀ BMB, 1♀ MNHN. **COUNTRY UNKNOWN** (2♂): no specific locality 2♂ BMNH.

Additional locality data: **BRAZIL**: *São Paulo*: Mata de Santa Genebra, nr. Campinas (Ecoforça, 2000).

Adelpha capucinus gutierrezi Neild, 1996 **stat. nov.**

Figs. **73i,j**; *299*

Adelpha juruana gutierrezi Neild (1996: 38, pl. 2, fig. 94, pl. 3, fig. 95, 96)

TL: Río Chucurí, San Cristóbal, Táchira, Venezuela, 800m. **Types** (all Venezuela): **MIZA**: **HT**♂: Río Chucurí, Apr. [photograph examined]; **BMNH**(M): **PT**♂: Hda. Pánaga, Río Chucurí Mar.; **AFEN**: **PT**♂: Hda. Pánaga [both examined]; **TP**: **PT**♂: no date, coll. A. Neild, *leg.* F. Rey; **PT**♂: Río Chucurí Mar. [not examined]

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by having an orange band distal of the white DHW postdiscal band in cells Cu_2-Cu_1 to M_1-Rs, broadest in cell M_3-M_2 and M_2-M_1, where it also extends basally as sparse orange scaling across the postdiscal band. The distal edge of the white postdiscal band on the VHW is lined with orange-brown, rather than dark brown. There is slight variation in the extent of the orange scaling, and the presence or absence of orange scaling in the DFW discal cell between cell bars two and four.

This taxon was recently described by Neild (1996) as a subspecies of *A. juruana*, which I now, however, consider to be a synonym of *A. capucinus capucinus*, so I therefore place *gutierrezi* as a subspecies of *A. capucinus* (**stat. nov.**).

Range: *Adelpha c. gutierrezi* is known only from a small area in Venezuela, in the state of Táchira, in the eastern foothills of the Cordillera de Mérida. It probably also occurs in the states of Barinas and Apure.

Habitat and adult ecology: This subspecies is apparently uncommon and has been recorded from only two areas. It flies up to 800m and has been found in March, April and October. It is interesting to note that this subspecies apparently does not occur as the form with the white DFW, almost certainly because the DFW patterns of sympatric species with which this subspecies is involved in mimicry, listed under this section for *A. cytherea*, all have an entire orange DFW postdiscal band.

Specimens examined (3♂):

VENEZUELA (3♂): *Táchira*: Hda. Pánaga, Río Chucurí, San Cristóbal Mar. 1♂ BMNH, 1♂ AFEN; Río Frío 600m Oct. 1♂ AFEN.

Adelpha barnesia Schaus, 1902

Figs. **74**; 165; 248; *300*

Identification, taxonomy and variation:

This species is distinguished from *A. malea*, *A. messana*, *A. erotia* form "lerna" and *A. naxia* by having an orange spot in cell M_2-M_1 on the DFW of similar size or larger than that in cell M_1-R_5, of which the distal edge is aligned with the distal edge of the orange marking in cell M_3-M_2. *Adelpha naxia* also always has a well developed white postdiscal spot in cell Cu_1-M_3, *A. malea* has the silvery grey inner submarginal series on the VFW parallel to the distal margin, rather than basally displaced in cell Cu_1-M_3, with all the spots of approximately equal size, while *A. messana* and *A. erotia* have the inner and outer postdiscal series in cell Cu_2-Cu_1 on the VFW fused to form a single large pale spot distal to the postdiscal band. *Adelpha erotia* is also distinguished by several other ventral characters (see under that species). *Adelpha diazi* is distinguished under that species, while *A. capucinus* always has the orange DFW subapical marking touching the white postdiscal marking in cell Cu_1-M_3, and the inner postdiscal series on the VFW in cell Cu_2-Cu_1 reduced to a small spot at the anterior edge of the cell or absent. There is variation in the shape and colour of the DFW subapical marking, the colour of the ventral surface and expression of the VHW submarginal bands, and three subspecies are recognised.

This species is superficially similar to *A. malea ixia*, *A. malea fundania*, *A. naxia* and *A. messana*, but is actually most closely related to *A. diazi* and *A. capucinus*, with which it shares similar ventral wing pattern, male genitalia and DFW subapical markings.

Range and status: Mexico to western Ecuador, northern Venezuela to Bolivia, Brazil and Trinidad. Not uncommon in Central America, rare in South America, from sea level to 900m.

Specimens examined: 148 (119♂, 29♀)

Adelpha barnesia barnesia Schaus, 1902

Figs. **74a,b**; *300*

Adelpha barnesia Schaus (1902: 396)

TL: Bolivia. **Types**: **USNM**: **HT**♂: "Bolivia//Type No. 5891 USNM//adelpha Barnesia type Sch.//Collection W. Schaus" [examined]

=*Adelpha pseudomessana* Fruhstorfer (1913: pl. 107b; 1915: 526) **syn. nov.**

TL: [Tarapoto; Chanchamayo, Peru]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//pseudomessana Fruhst.//Peru H. Fruhstorfer//Tarap. Peru Mich.//TYPE//Type//Syntype"; **BMNH**(M): **ST**♂: "Paratype//Chanchamayo Peru (Schunke)//Fruhstorfer Coll. B.M. 1937-285"; **BMNH**(R): **ST**♂: "pseudomessana Fruhst.//Syntype//Type//R//Chanchamayo, East Peru (Schunke)//107 B5//pseudomessana" [all examined]

Adelpha ixia pseudomessana Frust., Hall (1938)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. b. leucas* by typically having a larger orange subapical spot in cell M_2-M_1 on the DFW, which is joined by heavier orange to the upper postdiscal band, a more produced hindwing tornus, thicker postdiscal series dashes in cell Cu_2-Cu_1 on the VFW, and heavier silvery grey inner submarginal series on the VHW, which almost touch the outer postdiscal series at the veins. In *A. b. leucas*, the outer postdiscal and inner submarginal series are clearly separate throughout the VHW. *Adelpha b. trinita* is distinguished under the account for that subspecies. There is some variation in this subspecies as discussed below. I have examined a single female from Gávea, and a male from Santa Catharina, in Brazil, which have increased orange scaling on the DFW, almost entirely filling cell M_2-M_1 between the subapical spot and the upper postdiscal band, with a narrower white postdiscal band and a ventral surface like the holotype of *barnesia*. These specimens are discussed below.

Schaus (1902) described this species based on a single specimen in the USNM from Bolivia, and I have examined the holotype (Fig. 74a,b). The description is accurate and it is unclear why Fruhstorfer (1915) seemed unaware of its true nature, except that he himself lacked specimens of the species from Bolivia. Instead, he figured a specimen, probably the syntype in the BMNH(R), under the name *pseudomessana* (Fruhstorfer, 1913), and later stated that the name was based on specimens from Tarapoto and Chanchamayo (Fruhstorfer, 1915: 520). I have examined three syntypes in the BMNH and they differ from the holotype of *A. barnesia* in having slightly broader white postdiscal bands, larger orange subapical spots in cells M_1-R_5 and R_5-R_4 on the DFW (these spots are almost obsolete in the holotype of *A. barnesia*), in lacking a tiny white dot at the basal edge of the orange postdiscal marking in cell Cu_1-M_3 on the DFW, in having a slightly less pronounced inner submarginal series on the VHW, a slightly less produced hindwing tornus and less heavy silvery grey scaling in the VFW apex. There may prove to be a phenotypically stable population extending from eastern Bolivia to southeastern Brazil, including the holotype of *barnesia* and the two specimens from Rio de Janeiro and Santa Catharina, while the name *pseudomessana* would then be available for the Amazonian population. However, I have seen insufficient specimens to determine whether any of the differences between these two putative populations are consistent, and it is my opinion that they are all too slight and subject to too much variation in the specimens that I have examined to retain *pseudomessana* and *barnesia* as distinct taxa at the present, and I therefore synonymise the two names (**syn. nov.**).

Fruhstorfer (1915: 520) misidentified the single specimen in the BMNH of *A. ximena mossi* as this species, while Hall (1938) treated this taxon (under the name *pseudomessana*) as a subspecies of *A.* (*malea*) *ixia*. However, the taxon differs in a number of wing pattern and genitalic characters from that species (see discussion under *A. barnesia*).

Range: I have examined specimens of the nominate subspecies from Colombia (specimens in the AMNH labelled "northeastern Peru" were actually collected in the provinces of Meta or Caquetá in Colombia (Lamas, 1976)) to Bolivia, from the central Amazon in Brazil, and southeastern Brazil, with the majority of specimens from the Andean foothills. Although this subspecies is unrecorded to date from Venezuela or Ecuador, it almost certainly occurs in both countries.

Habitat and adult ecology: This subspecies is generally rare throughout its range, although judging from a series of seven males in the AMNH from Jepelacio, it may be locally common. It appears to be confined to primary lowland forest below 400m. Jason Hall (pers. comm.) captured a single male at Cacaulândia, Rondônia, in a forest light gap in a trap baited with rotting fish.

Specimens examined (27♂, 2♀):

"**HONDURAS**" (2♂): *Cortés*: San Pedro Sula 2♂ BMNH-error. **COLOMBIA** (1♂): *Not located*: "northeastern Peru" 1♂ AMNH. **PERU** (19♂): *Junín*: Chanchamayo 2♂ BMNH; La Merced 1♂ BMNH; *Loreto*: Contanamá 1♂ BMNH; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Boca Río La Torre 300m Sep. 1♂ MUSM; Pakitza 400m Oct. 2♂ MUSM; *San Martín*: Jepelacio 7♂ AMNH; Tarapoto 1♂ BMNH, 1♂ MCZ; *Not located*: Río Huallaga 1♂ AMNH; S. Peru 1♂ BMB. **BOLIVIA** (2♂): *El Beni*: Río Yata, nr. Guayamerín Aug. 1♂ AME; *Not located*: no specific locality 1♂ USNM. **BRAZIL** (3♂, 1♀): *Amazonas*: lower Rio Madeira Jul.-Sep. 1♂ BMNH; *Rio de Janeiro*: Gávea Oct. 1♀ AME; *Rondônia*: Rancho Grande nr. Cacaulândia 200m Nov. 1♂ KWJH; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 1♂ FSCA. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ BMNH.

Adelpha barnesia leucas Fruhstorfer, 1915 **stat. nov.**

Figs. **74c,d**; 165a,b; 248a,b; *300*

Adelpha ixia leucas Fruhstorfer (1915: 525)

TL: Mexico. **Types**: **BMNH**(T): **LT**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//152//Fruhstorfer Coll. B.M. 1937-285//ixia leucas Fruhst.//Mexico Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha pseudomessana* forma *paula* Bargmann (1928: 236) **syn. nov.**

TL: Río Dagua [Colombia]. **Types**: **ZMUC**: **HT**♂: "Río Dagua 800m//Type//pseudomessana paula male type//Adelph. pseudomessana Fruhst. f. paula Bargm. Río Dagua 800m Columbia Modt. 18//9 1929 af R. Krüger Coll. C.S. Larsen Faaborg" [photograph examined]

Adelpha ixia fundania Fruhst., D'Abrera (1987) misid.; *Adelpha leucas* Fruhst., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate and *A. b. trinita* under their respective accounts. There is some variation both individually and geographically. The size of the orange DFW subapical marking varies, and a single specimen examined lacks the orange spot in cell Cu$_1$-M$_3$. I have provisionally identified the four known northwestern Ecuadorian specimens as this subspecies, although they all have conspicuously narrower white postdiscal bands than typical Colombian *A. b. leucas*. I have examined a single male from Cisneros, in western Colombia, which is also similar to Ecuadorian specimens, while the holotype of *paula*, from the same area, has postdiscal bands of typical width. Since the difference is one of degree it seems best not to recognise these specimens as a distinct taxon, until more material is available from Nariño or Cauca provinces in Colombia, or further south in western Ecuador. In northwestern Venezuela a remarkable form occurs, figured by Neild (1996: pl. 4, fig. 153) as *A. leucas trinita* (var.). The upper postdiscal band is isolated from the postdiscal series and pure white. This form strongly resembles *A. b. trinita*, but since it lacks the white spot of the postdiscal band on the VFW in cell Cu$_1$-M$_3$, and occurs within the range of typical *A. b. leucas*, I have identified it as the latter subspecies for the present. However, since *A. barnesia* appears to be unknown from the Cordillera de la Costa in Venezuela (Neild, 1996), there may prove to be intergrades in this area between this form and *A. b. trinita*, or it may prove to be part of a stable population, and therefore this taxonomic arrangement is tentative. I have examined a single female from Atánquez in northern Colombia, which also show some characteristics of this form in having a paler upper postdiscal band on the DFW and wider postdiscal bands.

Fruhstorfer (1915) described this taxon from an unspecified number of specimens from Mexico, and stated that it differed from *A. malea fundania* in having "the second preapical stripe elongated and distally bent up anteriorly", by which I believe he was referring to the presence of the orange subapical spot in cell M$_2$-M$_1$ which distinguishes this species from *A. malea*. He also stated that the orange DFW subapical marking was very similar to *pseudomessana* (=*A. b. barnesia*), and that the greyish violet ventral markings were broader. This description is consistent with a syntype female in the BMNH, but since Fruhstorfer confused *A. malea* and *A. barnesia*, and both occur in Mexico, I designate this specimen with the following data as the lectotype of *Adelpha ixia leucas*: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//152//Fruhstorfer Coll. B.M. 1937-285//ixia leucas Fruhst.//Mexico Fruhstorfer//TYPE//Type//Syntype". Bargmann (1928) described *paula* as a form of *pseudomessana* (=*A. b. barnesia*), but did not mention *leucas* in his description. I have examined a photograph of the holotype specimen, courtesy of Gerardo Lamas, and it does not differ appreciably from typical specimens of this taxon, and I therefore synonymise *paula* with *leucas* (**syn. nov.**).

This taxon has traditionally been treated as a subspecies of *A.* (*malea*) *ixia* (Hall, 1938; DeVries, 1987; D'Abrera, 1987; Lamas & Small, 1992; de la Maza & de la Maza, 1993), and it was Neild (1996) who first noticed that it was clearly distinct and sympatric with this species throughout most of its range, and elevated it to specific rank. The characteristic orange DFW subapical spot in cell M$_2$-M$_1$, the distal edge of which is aligned with the distal edge of the marking in cell M$_3$-M$_2$, occurs only in *A. capucinus*, *A. diazi* and *A. barnesia barnesia*, while this species shares the orange subapical marking being isolated from the white DFW postdiscal band with the latter two species. My reasons for retaining *A. diazi* as a distinct species are explained under that species, and since this taxon is otherwise allopatric with respect to *A. b. barnesia* and differs in no fundamental characters, I place *leucas* as a subspecies of *barnesia* (**stat. nov.**).

Range: This subspecies has been recorded from both Pacific and Atlantic slopes of Mexico, though the latter requires confirmation west of the Isthmus de Tehuantepec, to northwestern Venezuela and western Ecuador. Raguso & Llorente (1991) report "*A. ixia leucas*" from the Sierra de Tuxtla, in Veracruz, but it is not possible to say whether this is *A. barnesia leucas* or *A. malea fundania*. De la Maza & Bezaury (1992) report an *Adelpha* species as "aff. *ixia leucas*" from the Mexican state of Quintana Roo, which is probably this taxon, as is the "*A. ixia leucas*" of Meerman (1999) from Corozal in Belize.

Habitat and adult ecology: This subspecies appears to be not uncommon in Central America, although it is rare in western Colombia, Ecuador and northern Venezuela. It has been recorded throughout its range from near sea level to 900m (de la Maza & de la Maza, 1993; Neild, 1996), in relatively intact lowland rain forest. In Mexico, specimens have been captured from June to January, while Austin *et al.* (1996) report it from March and August, two of the drier months, in the Tikal area of Guatemala, where it is rare in primary forest. This species is not uncommon at the end of the wet season in western Ecuador, but absent later into the dry season. All of the specimens I have seen have been males attracted to rotting fish in traps along trails or rivers through primary forest. Specimens from western Ecuador have narrower white postdiscal bands, similar to sympatric *A. iphiclus*, *A. iphicleola*, *A. serpa*, *A. seriphia*, *A. basiloides* and *A. erotia* form "lerna", and these taxa are almost certainly involved in mimicry. Perhaps even stronger evidence for mimicry is seen in the form from northwestern Venezuela similar to *A. b. trinita*, discussed above, which closely resembles a similar form in the sympatric *A. erotia caphira* form "lerna", *A. malea ixia* and *A. paraena reyi*.

Specimens examined (83♂, 21♀): † - form similar to *A. b. trinita*.

MEXICO (17♂, 2♀): *Chiapas*: Mapastepec Aug. 1♂ AME; Musté Sep. 3♂ AMNH; Petalcingo Jun. 1♂ AME; *Guerrero*: Acahuizotla Jun. Oct. 2♂ AME; *Michoacán*: Coahuayana Aug. 2♂ AME; *Veracruz*: Córdoba 1♂ BMNH; Dos Amates Jun. 1♂ AME; Jalapa 1♂ USNM; Presidio Jul. Aug. 2♂ AME; Tezonapa Jun. 1♂ AME; Tierra Blanca Aug. 1♂ AME; *Not located*: no specific locality 1♀ BMNH, 1♂, 1♀ AMNH. **GUATEMALA** (3♂, 5♀): *El Petén*: El Ceibal Nov. 1♀ AMNH; Sayaxché 1♀ AMNH; *Izabal*: Puerto Barrios Dec. 1♂ BMB; *Quezaltenango*: Volcán Santa María 1♂ BMNH; *Retalhuleu*: San Sebastián 1♂, 1♀ USNM; *Santa Rosa*: Guazacapán 1♀ AME; *Suchitepéquez*: Variedades 1♀ AMNH. **BELIZE** (1♂): no specific locality 1♂ BMNH. **EL SALVADOR** (1♀): *Chalatenango*: Tejutla Oct. 1♀ AME. **HONDURAS** (5♂, 1♀): *Cortés*: San Pedro Sula 2♂ BMNH; *Not located*: no specific locality 2♂, 1♀ ZMHU, 1♂ BMB. **COSTA RICA** (4♂, 4♀): *Cartago*: Juan Viñas Jun. 1♀ USNM; Turrialba 2000' Jul. 1♂ USNM; *Limón*: Guápiles 1♀ USNM; *Puntarenas*: Palmar Norte Aug. 1♂, 1♀ USNM; *San José*: Villa Colón 750m Aug. 1♂ USNM; *Not located*: no specific locality 1♂, 1♀ BMNH. **PANAMA** (13♂, 4♀): *Chiriquí*: Chiriquí 3♂ ZMHU; Potrerillos 3000' Feb. 1♀ USNM; *Colón*: Gamboa Aug. 1♂ BMNH; *Darién*: Caña 400m Jul. Aug. 7♂ USNM; *Panamá*: Cocolí Oct. 1♀ USNM; Farfán Jun. 1♀ USNM; Fort Kobbe Jun. 1♂ USNM; Madden Forest Nov. 1♂, 1♀ USNM. **COLOMBIA** (31♂, 4♀): *Antioquia*: Casabe, Río Magdalena Apr. Oct. Nov. 1♂, 2♀ AMNH; Medellín 1♂ ZMHU; *Boyacá*: Muzo Jun. Jul. 1♂ BMNH, 1♂ BMB, 1♂ USNM; *Caldas*: Río de la Miel Dec. 1♂ ESM; *Cundinamarca*: Bogotá 6♂ BMNH, 1♂ BMB; env. Bogotá 3♂ BMNH; La Mesa 4000' May Jun. 1♂ BMB; Région du Bogotá 1♂ BMNH; *Magdalena*: Atánquez, Santa Marta 850m Jul. 1♀ BMNH; *Santander*: El Centro 2♂ AMNH; *Valle del Cauca*: Cisneros Oct. 1♂ JFL; Jiménez W. Col. 1600' Jun. 1♂ BMNH; Río Dagua 6♂ BMNH; *Not located*: Santa Marta 1♀ BMNH; no specific locality 2♂ BMNH, 1♂ AMNH. **VENEZUELA** (2♂): *Trujillo*: La Gira Betijoque 560m Dec. 2♂† AFEN. **ECUADOR** (4♂): *Carchi*: Lita, ridge east of Río Baboso 900m Jul. 3♂ KWJH; Río Piguambí 800m Jul. 1♂ KWJH. **COUNTRY UNKNOWN** (3♂): no specific locality 1♂ FSCA, 1♂ AME, 1♂ BMB.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona (de la Maza & de la Maza, 1993); *Colima*: Platanarillos 900m Dec. (Warren *et al*., 1998); *Guerrero*: Río Santiago Sep. Dec. Jan.; *Jalisco*: La Calera Nov.; *Michoacán*: Coahuayana Aug.; *Nayarit*: Singayta Sep.; Mirador del Aguila Sep.; *Oaxaca*: Candelaria Loxicha, 2 mi. N., Oct.; Metates May (A. Luis, pers. comm., specimens in the UNAM).

Adelpha barnesia trinita Kaye, 1914 **stat. nov.**

Figs. **74e,f**; *300*

Adelpha phylaca trinita Kaye (1914: 556, pl. XXX, fig. 1)

TL: Port of Spain, Trinidad. **Types**: **AME**: **ST**♀: "W.J. Kaye Trinidad//54//phycalaca [sic] trinita Kaye TYPE" [examined]

Adelpha trinita Kaye, D'Abrera (1987); *Adelpha leucas trinita* Kaye, Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. b. barnesia* and typical *A. b. leucas* by the upper postdiscal band on the DFW being greyish white and isolated from the postdiscal series in cell M_3-M_2, and from both subspecies by having a silvery white postdiscal spot at the base of cell Cu_1-M_3 on the VFW. Occasional Venezuelan forms of *A. b. leucas* have the upper postdiscal band and postdiscal series isolated as in this subspecies, but they differ in having the upper postdiscal band entirely white, whereas in *A. b. trinita* the upper postdiscal band is pale yellowish or greyish white, or pale brown with sparse whitish scaling. The ventral surface of *A. b. trinita* is also a paler, more orange-brown than the darker, red-brown of *A. b. leucas*. There is some variation as to whether or not a pale white postdiscal spot is visible at the base of cell Cu_1-M_3 on the DFW, and in the colour of the upper postdiscal band.

This subspecies was described by Kaye (1914) based on specimens collected at Port of Spain, in Trinidad, by himself and Caracciolo, and it is probable that most or all of the specimens in the AME are syntypes. The original description and illustration, which appears to be of a female, leave no doubt as to its identity. The taxon was described as a subspecies of *A. phylaca*, and treated as such by Fruhstorfer (1915) and Barcant (1970), while D'Abrera (1987) accorded it specific status at the same time as saying he suspected it might be a race of *A. phylaca*. The male genitalia and wing pattern, with the postdiscal series visibly distinct in cell Cu_1-M_3 on the VFW, show it to be unrelated to *A. phylaca*, while the very similar form of *A. b. leucas* illustrated by Neild (1996), proves of a close relationship between these taxa, and Neild (1996) correctly regarded the two as conspecific. However, since I regard *leucas* as a subspecies of *barnesia*, I also place *trinita* as a subspecies of the latter (**stat. nov.**).

Range: This subspecies is known only from Trinidad, but it may well occur throughout northern Venezuela.

Habitat and adult ecology: Barcant (1970) reports that this subspecies is solitary to scarce, despite occurring at all elevations throughout the island. Typically it is found along forest edges perching 3-5m above the ground.

Specimens examined (9♂, 6♀):

TRINIDAD (8♂, 6♀): *St. George*: Arima-Blanchisseuse rd., mi. 3.5, Oct. 1♂ MJWC; Maraval Nov.-Feb. 1♂ BMB; St. Anns Jan.-Mar. 1♀ BMB; Santa Cruz Nov. 2♂ AME; *St. Patrick*: Siparia Oct.-Dec. 1♂ BMB; *Not located*: Northern Mts. Dec.-Jan. 1♂, 1♀ BMB; no specific locality Dec.-Feb. Apr. 1♀ BMNH, 2♂, 2♀ AME, 1♀ BMB. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Additional locality data: **TRINIDAD**: *St. George*: Arima-Blanchisseuse rd., mi. 10.5, Textel Track Mar.; Morne Bleu-Morne Brule Ridge 0.25 mi. S. Lalaja South Road Feb.; *St. Patrick*: Parrylands Nov. (M. Cock, pers. comm.); *Victoria*: Morne Diable Quarry Sep. (Barcant, 1970).

Adelpha diazi Beutelspacher, 1975

Figs. **75a,b**; 166a-c; 249a-c; *300*

Adelpha diazi Beutelspacher (1975: 31, fig. 1A,B, 2A,B, 3)

TL: Cerro El Vigía, Santiago Tuxtla, Veracruz, Mexico. **Types** (all Mexico, Veracruz): **UNAM**: **HT**♂: Cerro El Vigía Oct. [original photograph examined (?)]; **PT**♂: Dos Amates Jun.; **PT**♂, **PT**♀: Estación de Biología "Los Tuxtlas" Oct.; **ADF**: 2**PT**♂: Tapalapa Aug.; **PT**♂: Catemaco; **PT**♀: same locality as HT, May; **PT**♀: Tapalapa Sep.; **RDM**: **PT**♂: Dos Amates Aug.; **PT**♂: same locality as HT, Oct.; **PT**♀: Dos Amates Jul.; **PT**♀: Jicacal Nov. [not examined]

Identification, taxonomy and variation:

This species is distinguished from *A. barnesia* by the less dentate fore and hindwing distal margins and the more rounded hindwing shape in both sexes, particularly the female. The DFW lacks an orange subapical spot in cell R_5-R_4 and, typically, also in cell M_1-R_5, the orange spot in cell Cu_1-M_3 is reduced and the orange subapical spot in cell M_2-M_1 is usually coalesced with the upper postdiscal band. The white postdiscal spot in cell Cu_2-Cu_1 is larger and deforms vein Cu_1, such that this vein is no longer parallel with veins Cu_2 and M_3 but further from vein Cu_2 at its base than at the distal margin. On the VFW this species lacks the silvery grey dashes of the submarginal series in cell Cu_1-M_3, the ground colour of both wings between the submarginal series is blackish brown, so that the red-brown ovals at the end of each vein are isolated, rather than part of a continuous red-brown line, the ground colour immediately distal of the hindwing white postdiscal band is blackish brown instead of red-brown, the ground colour between the postdiscal series is a darker red-brown, with cells Cu_1-M_3 and M_3-M_2 typically dark brown, and the discal cell bars are more widely spaced, equal to their spacing on the forewing. The male genitalia of *A. barnesia* have a slightly more squared tip to the valvae, where the distal spines are located, whereas in *A. diazi* the spines appear to extend along the ventral edge of the valve tip. There is a little variation in the specimens examined in the extent to which the orange DFW subapical spot in cell M_2-M_1 is joined to the upper postdiscal band in this cell, and occasional specimens have a more pointed hindwing tornus.

This is a quite distinctive taxon, on specimens of which both Boisduval and Forbes had attached manuscript names (absyrta and oblonga, respectively), before Beutelspacher (1975) finally described it. I have not examined Beutelspacher's type series, which is in various Mexican collections, but the illustration of the male and female (which I assume are the holotype and a paratype, although this is not stated) readily allow its identification. Beutelspacher's comment that the DFW white band begins between veins M_3 and Cu_1 is presumably an error. Beutelspacher compared the species with "*A. ixia leucas*", which, as discussed under *A.*

barnesia leucas, could be either of two species, and stated that the orange DFW subapical marking and genitalia differed. Since it is not clear to which species he was referring, one cannot be sure to which differences he was alluding. This taxon is very similar in almost all important respects to *A. barnesia*, and the form of the orange DFW subapical marking is particularly reminiscent of the nominate subspecies. Almost all specimens have come from the Tuxtlas area in Veracruz, where *A. barnesia* is almost never, if ever, encountered. All of the specimens of *A. diazi* known from outside Veracruz and areas to the north have been collected by Escalante. I am informed by Armando Luis (pers. comm.) that there are many incidences of mislabelling of specimens by Escalante, I myself have seen specimens of Amazonian species labelled from Mexico by that collector. It therefore remains to be confirmed whether or not *A. diazi* occurs south and east of the Tuxtlas area. Armando Luis (pers. comm.) also informs me that all of the specimens of *A. b. leucas* in the UNAM are from the Pacific slopes, except for three collected by Kemner, a dealer, in Metates, while the only specimens that I have seen from the Tuxtlas are, again, collected by Escalante. It is therefore not at all clear whether or not *A. diazi* and *A. b. leucas* are sympatric. I thus deliberated for some time over the systematic placement of *A. diazi* with respect to *A. barnesia*, but I have decided to retain the two as distinct species given the possibility of sympatry, the relatively large number of differences discussed above, many of which are not typical infraspecific differences, the slight genitalic differences, and the lack of any intermediate specimens, which is unexpected given that there appears to be no major geographic barrier between the two taxa. However, any information on the sympatry, or intergradation, of these two taxa would be worth publishing.

Range: The true range of this species within Mexico still remains to be established, but it is known with certainty from the Tuxtlas region in Veracruz northwards into the states of Tamaulipas and Nueva León. A single specimen in the AME, collected by Escalante in Chiapas, is probably mislabelled given that the species is not listed from that area by de la Maza and de la Maza (1993).

Habitat and adult ecology: This species is apparently locally common and has been collected from August to December in lowland habitats from 100-900m, but nothing has been published on its biology.

Specimens examined: 30 (15♂, 15♀)

MEXICO (14♂, 15♀): *Chiapas*: Comitán Sep. 1♂ AME; *Nueva León*: Cola de Caballo Nov. 1♀ AME; *Oaxaca*: Chimalapa Oct. 1♂ AME; *Tamaulipas*: San Francisco Aug. 2♀ AME; Tampico Dec. 2♀ USNM; *Veracruz*: Catemaco Aug.-Oct. Dec. 9♂, 2♀ AME; Dos Amates Sep. 1♂, 3♀ AME, 1♂ AMNH; El Vigía 900m Aug. Sep. 1♀ MUSM, 1♀ AME; Jalapa 1♀ USNM; Tuxtla 1♂ MCZ; *Not located*: no specific locality 1♀ BMNH, 1♀ MCZ. "**BRAZIL**" (2♀): no specific locality 2♀ MNHN-error. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ MCZ.

Additional locality data: **MEXICO**: see type data above; *Oaxaca*: Chalchijapa May; *Veracruz*: El Vigía Oct.; Catemaco Sep. (A. Luis, pers. comm., specimens in the UNAM); Est. Biol. Los Tuxtlas (Raguso & Llorente, 1991).

Adelpha hesterbergi Willmott & Hall, 1999

Figs. **76a,b**; 167a,b; *300*

Adelpha hesterbergi Willmott & Hall (1999: 2, fig. 2a,b,12a,b)

TL: ridge to east of Río Baboso, nr. Lita, Carchi, western Ecuador. **Types**: **KWJH**: **HT**♂: ridge to east of Río Baboso 17 Jul. 1998; 2**PT**♂: same data as HT except 6 Jul. 1998 [all examined]

Identification, taxonomy and variation:

Adelpha hesterbergi is superficially similar to a number of species, but clearly externally closest to *A. sichaeus*. It differs from this species on the dorsal surface in having a broader upper postdiscal band on the forewing, which is not obscured by darker scales at the costa or cut by dark veins, and an entirely dark hindwing distal marginal fringe, which in *A. sichaeus* has white scaling between each pair of veins. On the VFW, *A. hesterbergi* has no silvery grey spot distal to the postcellular bar in cell M_2-M_1 and the pale postdiscal band is not cut by a darker line in cells Cu_2-Cu_1 and Cu_1-M_3. On the VHW, the silver line filling the posterior half of cell 3A-2A extends distally almost to the end of the white postdiscal band, whereas in *A. sichaeus* it is shorter; this reflects the relatively shorter distance between the distal ends of veins 3A and 2A in *A. hesterbergi* compared with *A. sichaeus*. Also on the VHW, the outer postdiscal series in *A. hesterbergi* is a pale reddish brown line composed of concave crescent-shaped segments, whereas in *A. sichaeus* it is visible only as very pale grey dashes. In addition, there are clear differences in the male genitalia, *A. sichaeus* having a smoothly rounded and tapering valve with no spines, *A. hesterbergi* having a squared tip to the valve with a number of spines. The ventral surface of *A. hesterbergi*, with its rich reddish and silver colours, the absence on the forewing of any dark line in the postdiscal band and the two prominent silvery grey spots in the tornus, of which the anterior spot is twice the width of the posterior spot, differentiate this species from *A. capucinus* and all other similar species. *Adelpha hesterbergi* exhibits little variation in the three Ecuadorian specimens known, except that the hindwing white postdiscal band is slightly more extended towards the tornus in the two paratypes. The only other specimen I have seen, a male from Costa Rica, is smaller, has the DFW subapical spot in cell M_2-M_1 almost absent, the DHW postdiscal band more elongated towards the tornus, the VFW postdiscal band less obscured by orange-brown scaling and the outer postdiscal series on the VHW with sparse silvery grey scales in each cell. As it seems likely that the populations from the western Andes and Costa Rica are isolated, more material may show the Costa Rican specimen to belong to a distinct taxon.

The male genitalia suggest that, despite superficial similarities with *A. sichaeus*, *A. hesterbergi* is actually more closely related to the *A. capucinus* group, including *A. capucinus*, *A. fabricia* and *A. barnesia*, and the shape of the hindwing anal margin is also consistent with this hypothesis. Both *A. fabricia* and *A. barnesia* occur in northwestern Ecuador sympatrically with *A. hesterbergi*, while *A. capucinus* is only known east of the Andes. The ventral characters given above, however, clearly distinguish the two species, and *A. hesterbergi* appears to occur in a different habitat type to all the other species in the group.

Range: The species is known from Costa Rica and northwestern Ecuador, and although unrecorded throughout Panama and western Colombia, it certainly should occur there.

Habitat and adult ecology: *Adelpha hesterbergi* is one of the rarest species in the genus, and is currently known only from two premontane rain forest localities between 1050m and 1200m in Costa Rica and northwestern Ecuador. DeVries (1987) makes no mention of the species in Costa Rica, and despite numerous visits since 1994 to the type locality in Ecuador I have only recently discovered the species there, where several individuals were encountered within a two hundred metre stretch of path along a steep ridge lined with primary forest. All were males attracted to traps baited with rotting fish hung along the forest edge or near the ground in light gaps in the middle of the morning. The visit to the type locality was made at the very end of the wet season, and several other rare *Adelpha* were recorded there for the first time, suggesting that *A. hesterbergi* may be highly seasonal.

Specimens examined: 4 (4♂)

COSTA RICA (1♂): "Costa Rica-Cartago, Moravia de Chirripo, 28-VI-1983, 1200m, *leg.* R.L. Hesterberg" 1♂ Coll. Richard Hesterberg, Florida. **ECUADOR** (3♂): *Carchi*: Lita, ridge east of Río Baboso 1050m Jul. 3♂ KWJH.

Adelpha abia (Hewitson, 1850)

Figs. **77a,b**; 168a-c; *300*

Heterochroa abia Hewitson (1850: 436, pl. IX, fig. 5)

TL: Rio de Janeiro [Brazil]. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9834 Heterochroa abia ♂ Hew.//Minas Geraes Hewitson Coll. 79-69 Heterochroa abia. 3.//abia//Type//Syntype" [examined]

=*Adelpha rufilia* Fruhstorfer (1915: 527)

TL: Rio Grande do Sul [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//rufilia Fruhst.//Rio Grande Brasil Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**♂: "Rio Grande Brasil Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1937-285" [both examined]

Adelpha abia Hew., Kirby (1871); *Limenitis abia* Hew., Brown & Mielke (1967); *Adelpha abia* Hew., D'Abrera (1987)

Identification, taxonomy and variation:

Adelpha abia is most similar in wing pattern to *A. epizygis*, but may be distinguished by the DFW orange subapical marking broadly reaching the costa, instead of just the basal half of the marking, and extending right across cell Cu$_1$-M$_3$ into cell Cu$_2$-Cu$_1$, instead of only half across cell Cu$_1$-M$_3$. On the ventral surface, the pale subapical marking on the forewing is split by a red-brown line of even width in *A. abia*, while this line thickens from cell M$_3$-M$_2$ towards the costa in *A. epizygis*. The white postdiscal band on the hindwing is immediately bordered by red-brown in *A. abia*, but dark brown in *A. epizygis*. *Adelpha abia* is distinguished from other similar species by the thin red-brown line that cuts the pale VFW subapical marking and by the orange DFW subapical marking touching the white postdiscal spot in cell Cu$_1$-M$_3$. Often, two small orange subapical dots are visible in cells M$_2$-M$_1$ and M$_1$-R$_5$ just distal of the orange DFW subapical marking, which are also diagnostic of this species. The thickening of the inner postdiscal series on the VHW in cells M$_1$-Rs and Rs-Sc+R$_1$, and the male genitalia, suggest that *A. abia* may be more closely related to *A. heraclea* and *A. naxia* than *A. epizygis*, while other superficially similar southeast Brazilian *Adelpha* (*A. calliphane*, *A. falcipennis*, *A. thessalia indefecta*) are not closely related.

Hewitson (1850) described this species from an unspecified number of specimens in his own collection, and figured the dorsal surface of the right hand pair of wings. Although the type locality is Rio de Janeiro, the putative syntype specimen in the type collection of the BMNH bears the locality data "Minas Geraes", and in fact I have seen no specimens in any collections from Rio de Janeiro. However, the original illustration is sufficiently accurate to permit unambiguous identification of this species from the taxa to which it is phenotypically closest on the dorsal surface, *A. thessalia indefecta* and *A. epizygis epizygis*. The orange subapical marking on the DFW of *A. abia* is broader in cell M$_3$-M$_2$ than in Cu$_1$-M$_3$ and M$_2$-M$_1$, forming a distinct "step" in the distal margin, and the marking touches the white postdiscal spot in cell Cu$_1$-M$_3$. In *A. thessalia indefecta* the distal edge of the marking is smoothly curving and the marking does not touch the white postdiscal spot in cell Cu$_1$-M$_3$. In addition, the hindwing tornus is more elongate in *A. abia* than in *A. t. indefecta*. *Adelpha epizygis* may be distinguished as discussed above. The BMNH syntype is from Hewitson's collection and agrees well with Hewitson's original figure, and I therefore assume that the original locality data were incorrectly transcribed to the current data label and accept this specimen as a valid syntype.

Fruhstorfer (1915) misidentified *A. thessalia indefecta* as Hewitson's *A. abia*, and described true *A. abia* a second time as *A. rufilia*. Both syntype male specimens mentioned in the original description are in the BMNH, and Fruhstorfer (1915) specifically noted the orange dots on the DFW distal to the orange subapical area that are characteristic of *A. abia*. Hall (1938) correctly synonymised *A. rufilia* with *A. abia*.

There is little variation in the few specimens examined, except that the orange DFW subapical dots may not be visible in some specimens (such as the Hewitson syntype).

Range: Coastal areas of eastern Brazil in the state of Bahia, south and west to Paraguay and northern Argentina, probably also occurring in Uruguay.

Immature stages: Müller (1886) reared this species in Santa Catharina (Brazil), although there is the distinct possibility that he misidentified it, given the number of more common, then undescribed species of *Adelpha* from that area. He described the final instar as differing noticeably from all other *Adelpha* that he reared in the scoli on T2, T3 and A2-A6 all being similar in form, instead of being more strongly developed on T2, T3 and A2. The scoli on A1 is apparently absent or reduced, while the scoli on T2 and T3 are slim, approximately straight and slightly anteriorly inclined. The scoli from A2-A6 are all of equal size, long and curved, while that on A7 is wider, with longer lateral spines. Similar sized scoli on segments A2-A6 also occur in *A. heraclea* (Moss, 1933) and *A. zina zina* (Aiello, 1984), although in both of these species the scoli cannot be described as long. The last instar has pale diagonal stripes on segments A4, A5 and A6, and a pale lateral, subspiracular stripe. The pupal projection on A2 is long and "thorn-like", while there are similar (but presumably smaller) dorsal thorn-like projections on A3 and A4 in a similar position to the scoli of the last instar. The pupa is shining silver with pronounced black markings, perhaps also suggesting a similarity with the white pupa of *A. heraclea*, with its distinctive black spots. The behaviour of the larva and pupa is similar to other members of the genus.

Habitat and adult ecology: Ebert (1969) found this species to be not uncommon in Minas Gerais in low canopy forest, at 1300m, in March, May and December. Brown (1992) reports that it occurs in forest clearings from 800m to above 1100m in the Serra do Japi, São Paulo, while elsewhere in Brazil it has been recorded down to around 200m. It is sympatric with a large number of superficially similar members of the *A. iphiclus* group, of which it is not a member, and it is presumably involved in mimicry with these species. Otherwise nothing has been published on the adult behaviour or ecology of this species, and judging from the number of specimens in collections it is rare in the field.

Specimens examined: 37 (34♂, 3♀)

BRAZIL (25♂, 3♀): "*Amazonas*": Canuma 1♂ AMNH-error; *Bahia*: San Antonio da Barra 1♂ BMNH; *Minas Gerais*: Serra do Espinhaço, km 344 Rio-Belo Horizonte Apr. 2♂ AME; no specific locality 1♂ BMNH; *Paraná*: Iguaçu Jan. Feb. 2♂ BMNH; *Rio de Janeiro*: P.N. Itatiaia 800m Dec. 1♂ USNM; *Rio Grande do Sul*: Guaraní Jan. 1♂, 1♀ MCZ; Rio Grande do Sul 2♂ BMNH; Santa Rosa Dec. 1♂ MCZ; *Santa Catharina*: Cauna Apr. 3♂ AMNH; no specific locality 2♂ AMNH, 2♂ BMB; *São Paulo*: São Paulo 2♂, 2♀ MCZ, 1♂ ZMHU; *Not located*: no specific locality 3♂ BMNH.

PARAGUAY (5♂): *Caazapá*: Buenavista Feb. 2♂ MCZ; *Central*: Santísima Trinidad Jul. 1♂ AMNH; *Guaíra*: Colonia Independencia Aug. Sep. 2♂ AME. **ARGENTINA** (3♂): *Misiones*: Campo Grande Jul. 1♂ AME; Iguaçu Falls, 17 km E. Puerto Aguirre May 2♂ BMNH. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Additional locality data: **BRAZIL**: *Distrito Federal*: Parque do Gama 1100m Jun. (Brown & Mielke, 1967); *Minas Gerais*: nr. Poços de Caldas 1300m Mar. May Dec. (Ebert, 1969); Passa Quatro (Zikán & Zikán, 1968); *Santa Catharina*: Jaraguá (Hoffmann, 1936); *São Paulo*: Parque Estadual Morro do Diabo (Mielke & Casagrande, 1997); Serra do Japi 800-1100m (Brown, 1992). **PARAGUAY**: *Itapúa* (Kochalka *et al*., 1996).

Adelpha naxia (C. & R. Felder, 1867)

Figs. **78**; 169; 250; *300*

Identification, taxonomy and variation:

This species is distinguished from all similar species by the white DFW postdiscal band extending into cell Cu$_1$-M$_3$ to form a pronounced spot. Other useful distinguishing features include the relatively small or absent orange subapical spot in cell M$_2$-M$_1$ in the DFW, the "kinked" basal edge of the orange subapical marking at vein M$_2$ (possibly due to the absence of the upper postdiscal series in cell M$_3$-M$_2$), the inner submarginal series on the VFW which is parallel to the distal margin and composed of straight, uniform silver-grey dashes, the distinct postdiscal series in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ on the VFW, and the broader postdiscal series in cells M$_1$-Rs and Rs-Sc+R$_1$ on the VHW. There is some variation in the width of the white postdiscal band and the shape of the orange DFW subapical marking, and three subspecies are recognised.

Adelpha naxia has dense, pale scales at the base of veins Rs-M$_2$ on the DHW, a character otherwise only found in *A. phylaca* and relatives. However, it appears to be more closely related to *A. heraclea* and *A. abia*, with which it shares similar male genitalia, with a short and rounded clunicula and a slightly upturned valva with no pronounced dorsal medial lobe, and wing pattern, with conspicuously swollen postdiscal series on the VHW in cells M$_1$-Rs and Rs-Sc+R$_1$. *Adelpha naxia* and *A. heraclea* are also similar in having the pale spot of the upper postdiscal band in cell Cu$_1$-M$_3$ on the VFW smaller than that in cell Cu$_2$-Cu$_1$ and separated from the inner postdiscal series, while the postdiscal series in cell Cu$_1$-M$_3$ are typically also separate.

Range and status: Mexico to Colombia, Venezuela to Bolivia, Brazilian Amazon, Trinidad and the Guianas. Although there are no records from western Colombia and western Ecuador, this species should certainly occur there also. In lowland rain forest from sea level to 1200m, uncommon to rare.

Specimens examined: 176 (138♂, 38♀)

Adelpha naxia naxia (C. & R. Felder, 1867)

Figs. **78a,b**; 169a,b; 250a,b; *300*

Heterochroa naxia C. & R. Felder (1867: 417)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Type//Bogotá Lindig Type//naxia n.//Felder Colln.//naxia Felder// Illustrated in The Butterflies of Venezuela A. Neild, 1996//136" [examined]

=*Adelpha dominula* Möschler (1877: 317, pl. 3, fig. 9) **syn. nov.**

TL: Surinam coast. **Types**: **ZMHU**: **HT**♀: Surinam//Origen//Am. Merid. Surinam [examined]

=*Adelpha epiphicla* Godman & Salvin (1884: 306, tab. XXVIII, fig. 9, 10) **stat. nov.**

TL: not stated. **Types**: **BMNH**(M): **ST**♂: "Syntype ♂ Adelpha epiphicla Godman & Salvin G. Lamas det. 1987//B.C.A. Lep. Rhop. Adelpha basilea Cram. Godman-Salvin Coll. 1916.-4.//Heterochroa epiphicla Bates//sp. figured//Polochic//♂//Polochic Valley F.D.G. & O.S.//Syntype" [examined]

=*Adelpha naxia mucia* Fruhstorfer (1915: 525) **stat. nov.**

TL: Volcán Chiriquí [Panama]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//naxia mucia Fruhst.//Chiriquí Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha naxia diatreta* Fruhstorfer (1915: 525)

TL: near Manaos on the Rio Negro [Brazil]. **Types**: **ZMHU**: **HT**♂: "Manáos '86 Hhl.//Syntype//Syntype male Adelpha naxia diatreta Fruhstorfer G. Lamas det. '87" [examined]

=*Adelpha naxia zynia* Fruhstorfer (1915: 525) **syn. nov.**

TL: Mato Grosso. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//xynia Fruhst.//Mato Grosso H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**♂: "Mato Grosso H. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285" [both examined]

=*Adelpha aufidia canuleia* Fruhstorfer (1915: 526) **syn. nov.**

TL: Tarapoto, Peru. **Types**: **ZSBS**: **HT**♂: "Canuleia Fruhst.//Peru H. Fruhstorfer//Tarapo Peru s.//Type" [photograph examined]

Papilio iphiclus Linn., Clerck (1764: tab. 41 [fig. 3, numbered in register at back]) misid.; *Nymphalis iphicla* Linn., Godart ([1824]: 374, n. 80) in part; *Heterochroa basilea* Cram., Bates (1865) misid.; *Heterochroa iphiclus* Linn., Boisduval (1870) misid.; *Adelpha iphicla* Linn., Kirby (1871) misid.; *Adelpha iphicla* var. *naxia* Fdlr., Kirby (1871); *Adelpha basilea* Cram., Godman & Salvin (1884) misid.; *Adelpha massilides* Fruhst., Beutelspacher (1976: fig. 4B, 5B) misid.

Identification, taxonomy and variation:

The nominate subspecies is distinguished from the remaining two subspecies under their accounts. There is individual variation in the width of the white postdiscal bands and the size of the white DFW postdiscal spot in cell Cu$_1$-M$_3$, which may be half the size of the spot in cell Cu$_2$-Cu$_1$, in the presence or absence of an orange DFW subapical spot in cell M$_2$-M$_1$, and in the expression of the ventral postdiscal and submarginal series, which affects the overall colour of the ventral surface.

This taxon was first figured by Clerck (1764) on plate 41, misidentified as Linnaeus' *Papilio iphiclus*, and it seems that most early authors were unsure whether to regard *A. iphiclus* and *A. naxia* as distinct species or not. Felder & Felder (1867) described *A. naxia* based on an unspecified number of male specimens collected by Lindig at Bogotá, in the Felder collection. The description refers to the DFW having an orange subapical marking between vein M$_3$ and the costa, with two small orange subapical spots, and on the underside, the pale subapical marking in cell M$_3$-M$_2$ being longer than in *A. iphiclus*. The taxon is clearly this species, as a syntype in the BMNH, figured by Neild (1996), confirms. Möschler (1877), however, seems to have been unaware of the Felders' description, since there is no mention made of *A. naxia* in his description of *dominula*, which was based on a single female from the Surinam coast. The description is detailed, referring to the positions of the various dorsal surface markings, which, combined with the holotype female in the ZMHU, show this name to apply to *A. naxia*. Although Fruhstorfer (1915) retained the two taxa, there are essentially no differences between the types of *naxia* and *dominula*, and I therefore synonymise the latter with the former (**syn. nov.**). Godman & Salvin (1884) took it upon themselves to synonymise their new taxon, *A. epiphicla*, in the original description; both surfaces of a specimen from Guatemala were figured on plate 28 under that name, but they stated on p. 306 that they deemed their specimen to be *Adelpha basilea* Cramer (actually *A. iphiclus*). Although they offered no information as to whence the figured specimen originated, there is a specimen in the BMNH from their collection labelled as "sp. figured", which matches the original figure and is therefore a syntype. Ironically, it is the name *epiphicla* that I have deliberated over the most as to its validity, since the syntype, and indeed most Central American specimens, differs from typical *A. naxia* in having a more even white DFW postdiscal band, the VHW postdiscal series are straighter and parallel with the distal edge of the white postdiscal band, the ground colour is typically a deeper red and the silvery subapical spot in cell M_2-M_1 of the VFW is typically elongated to touch the postdiscal band. However, all of these characters are variable, and to some extent clinal, being more pronounced in western specimens, and I therefore synonymise *epiphicla* with *naxia* (**stat. nov.**). Fruhstorfer (1915) described *A. naxia mucia* based on a specimen or specimens from Volcán Chiriquí, as differing from *epiphicla* in having a narrower white DFW postdiscal band and a more reddish ventral surface. I have examined a syntype in the BMNH and indeed this description applies, but the reduced white DFW band appears to be slightly aberrant, while the reddish ventral surface is similar to the nominate subspecies. In fact, I suspect the specimen may be mislabelled and actually be from Colombia, although Hall (1938) deemed the name to be synonymous with *epiphicla*. The differences represent no more than individual variation, so I synonymise *mucia* with *naxia* (**stat. nov.**). *Adelpha naxia diatreta* was described by Fruhstorfer (1915) based on a specimen in Staudinger's collection in the ZMHU from Manaus, which only differs from the syntype of *A. naxia* in having a slightly darker ventral surface, and Hall (1938) correctly synonymised the name with *A. naxia*. Fruhstorfer described a further subspecies, *A. naxia zynia*, based on two males in his collection from Mato Grosso, which do indeed have slightly paler ventral surfaces than normal due to expansion of the postdiscal series, and slightly broader white postdiscal bands. However, these differences both fall within the boundaries of normal variation, and I synonymise *zynia* with *naxia* (**syn. nov.**). Finally, Fruhstorfer (1915) described a taxon, *canuleia*, as a subspecies of a new species *A. aufidia*, a synonym of *A. messana messana*, based on a specimen from Tarapoto in his collection. This specimen is in the Munich collection, and Gerardo Lamas kindly supplied me with a photograph. It differs from typical *A. naxia* only in having a small orange subapical spot in cell M_2-M_1 on the DFW, an entirely variable character, and I therefore synonymise the name with *naxia* (**syn. nov.**). It is a slight mystery why Fruhstorfer associated a specimen with a white postdiscal spot in cell Cu_1-M_3 on the DFW (the holotype of *canuleia*), with one that lacked this spot (the holotype of *aufidia*), except that *A. aufidia* seems to have been based exclusively on the possession of three subapical spots on the DFW, as seen in both of these specimens.

Range: Mexico to northern Colombia, and east of the Andes from Venezuela to Bolivia, the Brazilian Amazon, and in the Guianas. Austin *et al*. (1996) report it from Belize, whence I have seen no specimens.

Immature stages: These are unknown. There are also no known hostplant records, those listed in Aiello (1984: 21) under "*naxia ipiphicla*" apply to *A. heraclea heraclea* (DeVries, 1986, 1987, pers. comm.).

Habitat and adult ecology: This species is not uncommon in central America, de la Maza & de la Maza (1993) report it in Mexico from humid to semihumid lowland rain forest from 100-900m, while Austin *et al.* (1996) record it throughout the year in the Tikal area of Guatemala in secondary growth and forest edge habitats. DeVries (1987) states that the species is found in Costa Rica from 300-1200m in association with most forest habitats, that solitary individuals may be encountered along forest edges and rivers, and that both sexes feed on rotting fruits. In South America the species is rather rare, particularly in the central and lower Amazon, and the Guianas. I have seen only a single specimen from the latter area, from Surinam, and the species has not been recorded by Brévignon & Brévignon (1997) in French Guiana. In Ecuador I have found males to be attracted to rotting fish in traps along ridge top paths through primary forest. More commonly, males are encountered around the middle of the day puddling as solitary individuals along sandy roads through secondary forest or at forested streams, particularly at urine. In contrast to the observations of DeVries (1987) in Costa Rica, who states that the species is most common in the dry season, I have found it to be present typically in the wet season to early dry season, and absent or very rare throughout the remainder of the year.

Specimens examined (128♂, 22♀):
MEXICO (20♂, 10♀): *Chiapas*: San Quintín Sep. Oct. 4♂ AME; no specific locality Jul. 1♂ AME; *Colima*: Comalá 2100' Jan. 1♂ AME; *Guerrero*: Acahuizotla Jun. Sep.-Nov. 6♂, 2♀ AME; Acapulco Dec. 1♀ AMNH; El Treinte 220m Nov. 1♀ AME; La Venta 300' Sep. 1♂, 1♀ BMNH; Rincón 1♀ BMNH; no specific locality 1♂ BMNH; *Jalisco*: Navidad Nov. 1♀ AMNH; *Michoacán*: Coahuayana Jul. 1♂ AME; *Oaxaca*: Candelaria Loxicha Aug. Oct. 550m 2♂ AME; *Quintana Roo*: X-Can May Aug. 1♂ BMNH, 1♀ FSCA; *Tabasco*: Balancán Dec. 1♂, 2♀ AME; *Not located*: no specific locality 1♂ AME. **GUATEMALA** (13♂, 2♀): *Alta Verapaz*: Baléu 1350m Jun. 1♂ AME, 1♂ AMNH; Polochic Valley 7♂ BMNH; Tocoy 1♂ BMNH; Tucurú Mar. 1♂ BMNH; *El Petén*: Sayaxché 1♀ AMNH; *Izabal*: Cayuga 1♂ USNM; Quiriguá 1♀ USNM; *Not located*: no specific locality 1♂ ZMHU. **HONDURAS** (6♂): *Cortés*: San Pedro Sula Oct. 1♂ USNM, 1♂ BMNH, 1♂ BMB; *Not located*: no specific locality 2♂ ZMHU, 1♂ USNM. **COSTA RICA** (2♂, 1♀): *Cartago*: Juan Viñas 1♀ USNM; *Puntarenas*: Río Tarcoles 50m Sep. 1♂ KWJH; *Not located*: no specific locality 1♂ ZMHU. **PANAMA** (17♂, 4♀): *Chiriquí*: Bugaba 800-1500' 2♂ BMNH; Chiriquí 2♂ ZMHU, 4♂ BMB, 1♂, 1♀ MCZ; Chiriquí 1♂ BMNH-error?; Cerro Colorado 1450m Aug. 1♀ USNM; *Darién*: Caña 400m Jul. 2♂ USNM; *Panamá*: Bayano Oct. 1♂ USNM; Cocolí Jun. 1♂ USNM; Farfán Jul. 2♂ USNM; *Not located*: Canal zone Apr. 1♀ AME; Cord. San Blas Oct. 1♀ USNM; Madden Dam May 1♂ FSCA. **VENEZUELA** (1♂): *Amazonas*: Gavilán, 35 km S.E. Puerto Ayacucho 100m 1♂ AFEN. **COLOMBIA** (18♂, 1♀): *Amazonas*: Río Caquetá 1♂ BMNH; *Boyacá*: Muzo 1♂ AME; Otanche Oct. 1♂ JFL; *Caldas*: Guamocó 1♂ AMNH; *Cundinamarca*: Bogotá 4♂ BMNH, 2♂ USNM; Casanare 2-3000' 1♂ USNM; Cupiagua, Casanare Jan. 1♂ JFL; *Magdalena*: Onaca, Santa Marta Jun.-Aug. 1♀ BMNH; *Santander*: Carare 1♂ BMNH; El Centro 1♂ AMNH; *Vaupés*: Mitú Oct. 2♂ JFL; *Not located*: no specific locality 1♂ BMNH, 1♂ ZMHU. **ECUADOR** (10♂): *Napo*: Aguano 1♂ BMNH; Chichicorrumi Jul. Oct. 2♂ KWJH, 1♂ MJP; Satzayacu 700m Sep. 1♂ KWJH; *Pastaza*: Pitirishca 1000m Jul. 1♂ KWJH; *Not located*: no specific locality 2♂ BMB, 1♂ MCZ, 1♂ AMNH. **PERU** (28♂): *Junín*: Chanchamayo 1♂ ZMHU; *Loreto*: Caballo Cocha 1♂ BMNH; Iquitos 1♂ AMNH; lower Río Tapiche Jul. 1♂ AMNH; Pebas 1♂ BMNH, 3♂ ZMHU; Río Ampiyacu 100-500' Jul. Aug. 1♂ BMNH, 1♂ BMB; Río Sucusari 140m Sep. 6♂ MUSM; Yahuas terr. 1♂ BMNH; no specific locality Jun. Aug. 1♂ BMB; *Madre de Dios*: Boca Río La Torre 300m Oct. 1♂ MUSM; Pakitza 340m Sep. 2♂ MUSM; Puerto Maldonado 1♂ AME; *Pasco*: Pichis Rd. 1♂ BMB; *Not located*: Huallaga 1♂ ZMHU, 1♂ AMNH; Río Marañón 1♂ BMNH; middle Río Ucayali 2♂ AMNH. **BOLIVIA** (5♂): *Santa Cruz*: Prov. del Sara 1♂ BMNH; Santa Cruz Mar.-May 3♂ BMNH, 1♂ MNHN. **BRAZIL** (7♂, 1♀): *Amazonas*: Caiary-Vaupés 1♀ AMNH; Ega 1♂ BMNH; Manaus 1♂ ZMHU; *Mato Grosso*: no specific locality 4♂ BMNH; *Pará*: Óbidos 1♂ BMNH. **SURINAM** (1♀): no specific locality 1♀ ZMHU. **COUNTRY UNKNOWN** (1♂, 2♀): Amazonas 1♂ BMNH; no specific locality 1♀ BMNH, 1♀ MCZ.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona (de la Maza & de la Maza, 1993); *Jalisco*: Atenquique (Beutelspacher, 1976); *Quintana Roo*: Carrillo Puerto; Noh-bek; Tres Reyes (de la Maza & Bezaury, 1992). **BELIZE**: *Corozal*; *Cayo* (Meerman, 1999). **ECUADOR**: *Morona-Santiago*: Méndez-Santiago rd., km 40, Nov.; *Napo*: Pimpilala Aug. Sep.; Yasuní Aug. (Willmott & Hall, sight records). **BRAZIL**: *Amazonas*: Ilha de Maracá (Mielke & Casagrande, [1992]).

Adelpha naxia hieronica Fruhstorfer, 1913

Figs. **78c,d**; *300*

Adelpha hieronica Fruhstorfer (1913: pl. 107c; 1915: 525)

TL: [Tabaginte [sic], Narieva District, Trinidad]. **Types**: **BMNH**(R): **ST♂**: "62//Type//Syntype//R//Tabaquite, Narieva Dist., Centr. Trinidad//107 C1// naxia hieronica Fruhst." [examined]

Adelpha naxia hieronica Fruhst., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the narrower orange blocks composing the orange DFW subapical marking, the upper postdiscal band being almost half the width of that in the nominate subspecies, and by the slightly broader white postdiscal bands. It is distinguished from *A. naxia oteroi* under that subspecies. There is little variation in this subspecies.

Fruhstorfer (1913) figured the unique syntype of this subspecies (here, Fig. 78c,d) and subsequently described it as a subspecies of *A. naxia* (Fruhstorfer, 1915: 525), and there is no doubt as to its identity.

Range: The island of Trinidad.

Habitat and adult ecology: Barcant (1970) reports that this subspecies is solitary and scarce, being most common in the south of the island, although it occurs throughout the island at all elevations. Individuals are typically encountered perching along forest edges 3-5m above the ground, and have been collected from October to March.

Specimens examined (7♂, 10♀):
TRINIDAD (7♂, 10♀): *St. George*: Arima Oct.-Mar. 4♀ BMB; Hololo 1000' 1♀ AME; St. Anns Oct.-Dec. 1♀ BMNH, 1♀ BMB; *Caroni*: Tabaquite, Narieva District Oct.-Dec. 1♂ BMNH, 1♀ BMB; *Not located*: Northern Mts. Dec. Jan. 1♂ BMB; no specific locality Jan. Nov. Dec. 3♂, 1♀ AME, 1♂, 1♀ BMB, 1♂ BMNH.
Additional locality data: **TRINIDAD**: *Victoria*: Morne Diable Quarry rd. Nov. (Barcant, 1970); *Caroni*: Las Lomas, Spanish Farm Aug.; *St. Patrick*: Parrylands Sep. (M. Cock, pers. comm.).

Adelpha naxia oteroi Neild, 1996

Figs. **78e,f**; *300*

Adelpha naxia oteroi Neild (1996: 135, pl. 3, fig. 137-140)
TL: Maracay, Venezuela. **Types** (all Venezuela): **BMNH**(M): **HT**♂: Maracay Mar.; **MNHN**: **PT**♂: Libertad Dolores; **PT**♀: no locality; **BMB**: 5**PT**♀: Caracas 3000' Sep.-Oct.; [all examined]; **RM**: **PT**♂: Los Morros de Macaira, Guárico 800m Dec.; **PT**♀: Maracay 900m Dec. [not examined]

Identification, taxonomy and variation:

This subspecies is distinguished from *A. n. hieronica* by the broader white postdiscal bands, which extend on the DFW as far distally as the distal edge of the orange postdiscal marking in cell M$_1$-R$_5$ and are of almost even width, with straight basal and distal edges, by the orange postdiscal spot in cell M$_3$-M$_2$ being reduced in width so as to be of even width or (typically) narrower than the spot in cell M$_2$-M$_1$, or entirely absent. The ventral surface is paler and the postdiscal and submarginal series less distinctly defined, and the pale postdiscal spot in cell M$_3$-M$_2$ on the VFW is split by a dark red-brown line near its distal edge, which may prove to be characteristic of this subspecies. There is some variation in the size of the orange spot in cell M$_3$-M$_2$, which may be entirely absent, and in the width of the orange markings of the upper postdiscal band, which in some female specimens are noticeably paler. Specimens from the Apure region of Venezuela have broader orange DFW subapical markings, but still distinctly narrower than the nominate subspecies.

Neild (1996) figured several types of this subspecies and compared it with the nominate in his description. In fact it is possibly more similar to *A. n. hieronica*, but still consistently distinct from that subspecies.

Range: Cordillera de la Costa and along the eastern foothills of the Cordillera de Mérida in Venezuela, possibly extending south into extreme northern Colombia.

Habitat and adult ecology: *Adelpha naxia oteroi* is a rare subspecies, but perhaps no more so than the nominate, and has been recorded from near sea level to 900m, from September to March. The broad white bands and reduced DFW orange of this subspecies are typical of sympatric *Adelpha* such as *A. iphicleola*, *A. malea ixia*, *A. paraena reyi* and *A. erotia* form "lerna", and these species are almost certainly involved in mimicry.

Specimens examined (3♂, 6♀):
VENEZUELA (3♂, 5♀): *Aragua*: Maracay 480m Mar. 1♂ BMNH; *Barinas*: Libertad Dolores 1♂ MNHN; Río Caparo Feb. 1♂ USNM; *Distrito Federal*: Caracas 3000' Sep. Oct. 5♀ BMB. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ MNHN.
Additional locality data: **VENEZUELA**: see type data above (Neild, 1996).

Adelpha heraclea (C. & R. Felder, 1867)

Figs. 6e,9,18; **79**; 170; 251; *301*

Identification, taxonomy and variation:

This species is distinguished from almost all similar species by the conspicuously swollen postdiscal series, particularly the inner series, on the VHW in cells M$_1$-Rs and Rs-Sc+R$_1$; the only exceptions are *A. atlantica*, and, to a lesser extent, *A. capucinus*, but the latter species always has an orange subapical spot in cell M$_2$-M$_1$ on the DFW which is larger or of equal size to that in cell M$_1$-R$_5$ (the spot is typically absent in *A. heraclea*). *Adelpha atlantica* is most easily distinguished by the postdiscal band and postdiscal series being completely fused on the VFW in cell Cu$_1$-M$_3$; in *A. heraclea* the postdiscal band and series are distinctly separated by a red-brown line. *Adelpha pollina* is also similar, but in that species the postdiscal series are fused in cell Rs-Sc+R$_1$ on the VFW. The majority of other similar species (e.g., *Adelpha fabricia*, *A. atlantica*, *A. capucinus*, *A. erotia*, *A. thesprotia*) can also be distinguished by the orange on the DFW in *A. heraclea* filling the base of cell Cu$_1$-M$_3$, so that there appears to be a right-angled "notch" in the basal edge of the orange band at vein M$_3$. *Adelpha heraclea* may be additionally distinguished from *A. malea* by having a slightly basally displaced silver-grey submarginal marking in cell Cu$_1$-M$_3$ (in *A. malea* this marking is in line with the remaining series, which is parallel to the distal margin) and a dark red-brown line cutting through the middle of the pale postdiscal spot in cell Cu$_1$-M$_3$ (this line is often visible as darker scaling in *A. malea*, but not a solid line). The latter character and the separate pale dashes of the inner and outer postdiscal series in cell Cu$_2$-Cu$_1$ on the VFW additionally distinguish this species from *A. thesprotia*, *A. erotia*, *A. messana*, *A. phylaca*, and *A. delinita*. There are two populations with an orange postdiscal band on the DHW distal of the white postdiscal band, and three subspecies are recognised.

Despite the superficial similarity to many *Adelpha* species, *A. heraclea* appears to be most closely related to *A. naxia*, which has a rather different dorsal surface wing pattern. Characters which support this relationship are discussed under that species.

Range and status: Guatemala to western Ecuador, Venezuela to Bolivia and Brazil. Uncommon to rare in lowland rain forest from sea level up to 1100m.

Specimens examined: 79 (67♂, 12♀)

Adelpha heraclea heraclea (C. & R. Felder, 1867)

Figs. 6e,9,18; **79a,b**; 170a,b; 251a,b; *301*

Heterochroa heraclea C. & R. Felder (1867: 421)
TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Bogotá Lindig type//Syntype//Type//Heraclea Felder//Heraclea n." [examined]

=*Adelpha fugela* Hall (1938: 233) **syn. nov.**
TL: Óbidos [Brazil]. **Types**: **BMNH**(T): **HT**♀: "Fruhstorfer Coll. B.M. 1933-131//fugela Fruhst.//Óbidos Amazonenstrom VIII. IX. 99 ex coll. Fruhstorfer//TYPE//Type//Holotype"; **BMNH**(M): **PT**♀: "Fruhstorfer Coll. B.M. 1933-131//improvida Fruhst.//Bahia Brasilia Fruhstorfer//TYPE" [both examined]

=*Adelpha erotia erotia* form *fugela* Fruhstorfer (1915: 519) unavailable name
TL: Óbidos [Brazil]. **Types**: **BMNH**(T): **HT**♀: "Fruhstorfer Coll. B.M. 1933-131//fugela Fruhst.//Óbidos Amazonenstrom VIII. IX. 99 ex coll.

Fruhstorfer//TYPE//Type//Holotype"; **BMNH**(M): **PT**♀: "Fruhstorfer Coll. B.M. 1933-131//improvida Fruhst.//Bahia Brasilia Fruhstorfer//TYPE" [both examined]

Adelpha thesprotia var. *heraclea* Fldr., Kirby (1871); *Adelpha jordani* ssp. nov.?, Hall (1933); *Adelpha malea heraclea* Fldr., Hall (1933, 1938); *Adelpha fufia* Fruhst., D'Abrera (1987) misid.; *Adelpha malea* ssp. nov., Lamas & Small (1992); *Adelpha heraclea heraclea* Fldr., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. h. makkeda* and *A. h. antonii* by lacking a broad orange band distal of the white DHW postdiscal band. One specimen in the ZMHU from São Paulo de Olivença has slight orange scaling along the distal edge of the white DHW postdiscal band, while the three specimens examined from southeastern Brazil have a paler, more orange ventral ground colour than typical specimens.

Felder & Felder (1867) described this species based on an unspecified number of males collected by Lindig at Bogotá, in the Felder collection. They compared it to *A. thesprotia* and *A. aethalia*, but noted that the pale VFW postdiscal band was split by a darker line. Although this is also true of *A. boeotia*, a syntype in the BMNH allows certain identification of this taxon. The syntype has very sparse orange scaling along the distal edge of the white DHW band, and I suggest that it originated in the lowlands east of Bogotá and is showing slight intergradation to *A. h. antonii*, rather than this representing a stable subspecific character. As the specimen is clearly phenotypically closer to typical Amazonian specimens that lack any orange on the DHW, I apply the name to that population. Fruhstorfer (1915) described *fugela* as a form of *A. erotia erotia*, the type being from Óbidos with a paratype male from Bahia. In fact, the latter proves to be a female, bearing the name "improvida", an unpublished manuscript name later published as a *nomen nudum* by Martín *et al.* ([1923]), but corresponds otherwise with the original description. Although the *fugela* Fruhstorfer is a quadrinomial, it was made available by Hall (1938), who unconsciously introduced it as a new species name through bibliographic reference to Fruhstorfer's original description (ICZN, 1999: Art. 13.1.2, 45.5.1) (although Hall merely stated "*A. fugela* Fruhst.", the paper is clearly discussing names proposed by Fruhstorfer in Seitz (1915), as Hall states in his introduction). Fruhstorfer's reasoning for associating *fugela* with *A. erotia* seems to have been the heavy, whitish postdiscal and submarginal series on the ventral surface. Both the type specimens of *fugela* Fruhstorfer (and therefore *fugela* Hall – ICZN, 1999: Art. 72.4.4) are typical of the Amazonian population and I therefore synonymise *fugela* Hall with *heraclea* (**syn. nov.**).

This taxon has had an eventful taxonomic history. Fruhstorfer (1915) treated it as a distinct species on the basis of the orange scaling on the DHW, but failed to note any of the important ventral characters, since he described *fugela* as a form of *erotia*. Hall (1933) was also misled by the orange DHW scaling of the syntype, and placed it as a subspecies of *A. malea*, whilst regarding typical Amazonian *heraclea*, reared by Moss (1933), as an undescribed subspecies of *A. jordani*. Hall (1938) went on to regard the specimens named *fugela* by Fruhstorfer as a representing another distinct species, as did D'Abrera (1987), who also figured the species under the name *A. fufia*, a synonym of *A. cocala lorzae*. It remained for Neild (1996) to reinstate the specific status of *heraclea* and correctly associate it with *makkeda* and his new subspecies, *antonii*, and to realise that *fugela* was also conspecific, though he retained *fugela* as a distinct subspecies.

Given the ranges of *A. h. antonii* and *A. h. makkeda*, it seems probable that the Amazonian and Transandean populations of this subspecies are isolated at present. Lamas & Small (1992) listed the Transandean population as a new subspecies (of *A. malea*), but after some consideration I have decided against describing it. Central American specimens often have straighter silvery grey VHW postdiscal lines, which are typically less swollen in cells M_1-Rs and Rs-Sc+R_1, while the upper postdiscal band on the DFW is slightly broader. However, I have found that these differences are too minor and variable to allow certain identification of Transandean specimens from Amazonian specimens, and I have been unable to find any further consistent phenotypic differences between the two populations. While I have elsewhere recognised Central American populations which are very similar to Amazonian populations as distinct subspecies (e.g. *Adelpha cytherea marcia*, *A. melona neildi*), the two populations in both of these species are separated by a large area of central Colombia inhabited by another distinct subspecies. Furthermore, there are more pronounced phenotypic differences between both of these pairs of subspecies than are present in *A. heraclea*. Finally, given that *A. heraclea* has been found up to 1200m in Panama, there is a slight possibility of occasional gene flow across the Colombian Cordillera Oriental south of Bogotá, which in some areas extends below 1500m.

Range: This subspecies occurs from Guatemala to western Ecuador, throughout Colombia with the possible exception of the small area east of the Sierra de Perijá, to southeastern Peru and Brazil. The true range is probably more extensive, including eastern Mexico, Bolivia, and possibly the Guianas.

Immature stages: The adult voucher specimens in Moss' collection at the BMNH show that the species reared by him (Moss, 1933) in Pará, Brazil, and identified as *A. jordani*, is in fact *A. heraclea*. In Costa Rica, DeVries (1986, 1987) reports that the egg is white and laid singly, up to several times per plant (*Vitex*). Moss (1933) figured both the last instar larva (pl. I, figs. 8, 9) and the pupa (pl. II, fig. 11), and stated that early instars are dark brown and later become a uniform, plain dull green colour. The fifth instar noticeably lacks lateral scoli except on T2, having only the typical subdorsal scoli, which are all orange to the base and crowned with black spines. The scoli are of two principal types: on T2, T3 and A2 they are short, thick and have dense, fine lateral spines (Fig. 6e), while remaining scoli (A3-A10) are thinner, shorter and terminate in a rosette of long spines, lacking lateral spines. The fifth instar head capsule is orange and has dark brown markings on the top of the head between the bases of the p1 chalazae, between the bases of chalazae p2, p3 and m2, and surrounding the stemmata. There is a distinctive extra medial chalaza between m3 and m4, and very reduced anterior chalazae (Fig. 9); the latter character also occurs in *A. iphiclus* (see Aiello, 1984), but other larval characters, the male genitalia, wing pattern, hostplant and pupa all show no evidence of a close relationship between *A. iphiclus* and *A. heraclea*. The pupa (Fig. 18) is remarkably distinctive, being white with black spots and streaks, strongly reminiscent of that of *Methona* species (Ithomiinae). The black spots occur in a dorsal line on A2, laterally on the remaining segments with a dorsal spot on T7, and the head horns are small, laterally pointing triangles. DeVries' (1987) observations of the mature larva (figured on fig. 24, E) and pupa (not figured, as claimed in the text) in Costa Rica are consistent with those of Moss, except that he mentions a lateral creamy green spot on A2, and notes that the bases of the spines ringing the head capsule are black.

Moss observed that the larvae could be found either on small bushes or on the lower branches of trees along shaded forest trails, often "well above one's head", and that their behaviour was similar to other species of the genus. His figure shows the larva resting in the Front-Curved position. DeVries (1986) reports that the larvae in Costa Rica are solitary and feed on new, then old leaves, of saplings to mature trees along forest or river edges and in forest light gaps. Early instars make frass chains, later instars rest on damaged portions of leaves. The single record on *Piper* (by Marquis) is of a late instar feeding on all leaves in a light gap. A pupa in the PJD apparently took 6 days to eclose.

Habitat and adult ecology: DeVries (1987) reports that this species is present in Costa Rica throughout the year, and can be abundant in the dry season. It occurs from near sea level to 700m on the Atlantic slope, and to 400m on the Pacific slope, especially in swamp forest. Males can be encountered perching in the morning 5-10m above the ground, while females are typically seen in the middle of the day along forest edges and in light gaps where they search for oviposition sites. In eastern Ecuador I have found only males of this species, all of which have been attracted to traps baited with rotting fish, usually in large tree fall light gaps in primary forest, in bright sun. I have seen specimens there only from September to October, the end of the wet season, although it probably flies in lower numbers throughout the year. The single record from western Ecuador is based on an observation through binoculars of a male perching at the tip of a leaf with the wings open in an old hill top light gap in primary forest, 10m above the ground, in the early afternoon. Unfortunately, I was unable to capture the individual and its presence in this region requires confirmation. Elsewhere in its range this taxon is uncommon in collections, and it is very rare in South America outside the Amazon basin; in addition to a single specimen in the BMNH from Bahia, I have also examined a photograph, courtesy of Olaf Mielke, of three specimens in the UFP collected on the same day by Ebert in southeastern Minas Gerais, southeastern Brazil.

Specimens examined (63♂, 10♀):

GUATEMALA (1♂): *Izabal*: Cayuga 1♂ USNM. **NICARAGUA** (1♂): *Chontales*: Chontales 1♂ BMNH. **COSTA RICA** (1♂): no specific locality 1♂ ZMHU. **PANAMA** (16♂, 2♀): *Chiriquí*: Chiriquí 1♂ ZMHU; Potrerillos 3600' Apr. 1♀ USNM; *Colón*: Colón 1000' Mar. 1♀ USNM; nr. Colón, Santa Rita ridge 300m Feb. 1♂ USNM; *Darién*: Caña 500m Aug. 1♂ USNM; *Panamá*: Farfán Jul. 5♂ USNM; Fort Kobbe Jun. 4♂ USNM; Vigua Point Dec. 1♂ BMNH; *Not located*: Canal zone Jun. Jul. 3♂ BMNH. **COLOMBIA** (13♂, 2♀): *Antioquia*: Casabe, Río Magdalena Oct. Nov. 1♂ AMNH; Crystallina 1100' Jun. Jul. 1♂ BMB; *Cundinamarca*: Bogotá 3♂ BMNH, 1♂ ZMHU, 1♂ MCZ, 1♂ AMNH; *Santander*: La Soledad Dec. 1♂ AMNH; *Not located*: Villa Nova 1♀ BMNH; no specific locality 1♂, 1♀ BMNH, 1♂ BMB, 1♂ USNM, 1♂ AMNH. **ECUADOR** (7♂, 1♀): *Morona-Santiago*: Méndez-Santiago rd., km 40, Oct. Nov. 700m 1♂ MJP, 1♂ DAT; *Napo*: Apuya 600m Sep. 1♂ KWJH; Finca San Carlo 600m Sep. 2♂ KWJH; Río Tiputini 300m Sep. 1♂ KWJH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Oct. Nov. 1♂, 1♀ PJD. **PERU** (11♂): *Loreto*: Iquitos Aug. 2♂ BMNH, 1♂ ZMHU, 1♂ AMNH; Pebas 1♂ ZMHU; Yurimaguas Mar. 1♂ MCZ; *Madre de Dios*: Boca Río La Torre 300m Sep. 3♂ MUSM; Shintuya Jul. 1♂ AME; *San Martín*: Jepelacio 1♂ AMNH. **BRAZIL** (13♂, 5♀): *Amazonas*: Benjamin Constant Oct. 1♂ AMNH; São Paulo de Olivença 1♂ BMNH, 2♂ ZMHU; Tefé Oct. 2♂ BMNH; *Bahia*: Bahia 1♀ BMNH; *Mato Grosso*: no specific locality 2♂ BMNH; *Pará*: Óbidos Aug. Sep. 2♀ BMNH, 1♀ AMNH; Pará 4♂, 1♀ BMNH; *Minas Gerais*: Parque Estadual do Rio Doce 200m Sep. 2♂, 1♀ UFP(photograph); *Rondônia*: Cacaulândia 200m Nov. 1♂ KWJH.

Additional locality data: **ECUADOR**: *Esmeraldas*: El Durango Sep.; *Napo*: Capirón Jul.; Tiputini Biodiversity Station Aug.; *Pastaza*: Puyo-Canelos rd., km 30, 700m Oct. (Willmott & Hall, sight records).

Adelpha heraclea makkeda (Hewitson, 1871)

Figs. **79c,d**; 170c; *301*

Heterochroa makkeda Hewitson (1871: 165)

TL: "Pará"-erroneous. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//69//B.M. TYPE No. Rh. 278 Heterochroa makkeda ♂ Hew.//Pará Hewitson Coll. 79-69 Heterochroa makkeda 1.//Type//Syntype" [examined]

Adelpha makkeda Hew., Kirby (1871); *Adelpha malea makkeda* Hew., Hall (1933); *Adelpha heraclea makkeda* Hew., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the prominent orange DHW postdiscal band, and from *A. h. antonii* under that subspecies. The single specimen that I have examined in the USNM is possibly transitional to *A. h. heraclea*, and lacks the orange DFW cell bar and has orange on the DHW only from the costa to cell Cu$_1$-M$_3$.

Hewitson (1871) clearly and unambiguously described this subspecies based on an unspecified number of specimens in his collection from Pará, and a syntype male is in the BMNH (Fig. 79c,d). As Neild (1996) noted, the locality is erroneous, but this has caused several authors to regard the taxon as a distinct species (Kirby, 1871; D'Abrera, 1987), while Hall (1933) associated it with *A. malea*. Neild (1996) correctly placed it as a subspecies of *A. heraclea*, with which it shares the orange on the DFW filling the base of cell Cu$_1$-M$_3$, the basally displaced, distally pointing V-shaped silver submarginal marking in cell Cu$_1$-M$_3$ on the VFW, and the expanded postdiscal series on the VHW in cells M$_1$-Rs and Rs-Sc+R$_1$.

Range: The two specimens I have seen of this species with accurate locality data (one figured in Neild, 1996) are from El Tucuco, in the eastern foothills of the Sierra de Perijá in extreme western Venezuela. According to Neild (1996), its range possibly also extends to the western slopes of the Cordillera de Mérida.

Habitat and adult ecology: This subspecies is clearly very rare and Neild (1996) never encountered it in the field. Neild (1996) notes that this is one of the only *Adelpha* species which possesses an orange DHW band outside of the Apure region, and why this should be so, given its apparent function in mimicry, is a mystery.

Specimens examined (2♂):

VENEZUELA (1♂): *Zulia*: Los Angeles del Tucuco Apr. 1♂ USNM. "**BRAZIL**" (1♂): *Pará*: Pará 1♂ BMNH-error.

Adelpha heraclea antonii Neild, 1996

Figs. **79e,f**; *301*

Adelpha heraclea antonii Neild (1996: 36, pl. 2, fig. 71-74)

TL: San Esteban, Venezuela. **Types** (all Venezuela): **BMB**: **HT**♂: San Esteban Aug.-Sep.; **MNHN**: **PT**♂: Libertad Dolores; **PT**♀: Libertad [examined]; **R**: **PT**♂: Urb. Las Acacias 450m [Maracay, Aragua] [not examined]

Identification, taxonomy and variation:

According to Neild (1996), this subspecies is distinguished from *A. h. makkeda* by the smaller orange DFW subapical spots, the entirely brown DFW discal cell lacking the orange bar, and the DHW orange band being twice as wide, of equal width to the white postdiscal band. The holotype and a female paratype were figured, and I have examined three of the four type specimens. Unfortunately, though, I have been unable to examine sufficient specimens of *A. h. makkeda* to say which of the characters given by Neild (1996) are stable; the only specimen of *makkeda* that I have examined, apart from the syntype, is from Tucuco, as is the specimen figured by Neild (1996), and this lacks the orange DFW cell bar and has orange on the DHW only from the costa to cell Cu$_1$-M$_3$. This suggests that the orange DFW discal cell bar is not a stable character, while the width of the orange band on the DHW may be. Alternatively, specimens from Tucuco may be showing intergradation with nominate *A. heraclea heraclea* around the northern tip of the Sierra de Perijá, but there are too few specimens in collections to establish whether or not this is a possibility. I retain this subspecies for the present, in view of the few specimens I have seen, and hope that future collecting will help confirm its status.

Range: This subspecies is known with certainty only from Venezuela, from both northern and southern slopes of the Cordillera de la Costa, south along the eastern foothills of the Cordillera de Mérida. I have examined a single specimen in the AMNH supposedly collected in Colombia, but lacking precise locality data, and while the subspecies is expected to occur in the foothills of the Cordillera Oriental near the northern Colombian border, the almost complete lack of specimens of any *Adelpha* from this area in collections suggests it is more likely that this specimen is mislabelled.

Habitat and adult ecology: This subspecies is similarly rare, and there is almost no information available on its behaviour or habitat. It flies with a number of *Adelpha* species (listed under *A. cytherea nahua*) with which it is almost certainly involved in mimicry.

Specimens examined (2♂, 2♀):
VENEZUELA (2♂, 1♀): *Barinas*: Libertad Dolores 1♂ MNHN; Libertad, Zamora St. 1♀ MNHN; *Carabobo*: San Esteban Aug.-Sep. 1♂ BMB. **COLOMBIA** (1♀): no specific locality 1♀ AMNH-error?.
Additional locality data: **VENEZUELA**: see type data (Neild, 1996).

Adelpha atlantica Willmott, sp. nov.

Figs. **80a,b**; 171a,b; *301*

Description: MALE: forewing length (of paratype) 29mm. *Dorsal surface*: *Forewing*: ground colour dark brown; discal cell with darker brown basal streak, 1st, 2nd, 4th discal cell and postcellular bars dark brown, 1st and 2nd continuing into cell 2A-Cu$_2$; vertical band from costa to anal margin (composed of postdiscal band elements in all cells except Cu$_2$-Cu$_1$, Cu$_1$-M$_3$, M$_3$-M$_2$, where composed of fused postdiscal band and postdiscal series), basal edge slightly kinked and indented at vein M$_3$, with band in cell Cu$_1$-M$_3$ not filling base of cell; band broadest in cell M$_3$-M$_2$, tapering towards anal margin and sharply constricted towards costa; band orange, grading into white in middle of cell 2A-Cu$_2$, lined distally with orange, and entirely white posterior of vein 2A; two small orange subapical spots (representing fused postdiscal series) in cells M$_1$-R$_5$ and R$_5$-R$_4$; two darker brown submarginal rows of dashes (representing submarginal series). *Hindwing*: ground colour dark brown; postdiscal band white, extending from costa, broadening very slightly to cell Cu$_2$-Cu$_1$ then tapering to end roundly near tornus; postdiscal and submarginal series present as four rows of darker brown dashes; orange spot in tornus. *Ventral surface*: *Forewing*: ground colour orange-brown; discal cell silvery grey between base and 1st cell bar, and between 2nd and 4th cell bars; basal streak red-brown, 1st, 2nd and 4th cell bars dark brown, 3rd cell bar not visible, 1st and 2nd cell bars extending indistinctly into cell 2A-Cu$_2$, with slight whitish grey scaling distally and basally; slight pale greyish scaling immediately distal of postcellular bar and at base cell Cu$_2$-Cu$_1$; postdiscal band very pale orange-cream, of uniform width from anal margin to vein Cu$_1$, completely fused with postdiscal series in cell Cu$_1$-M$_3$ to form a broad spot almost twice width of postdiscal band in posterior cells, three elongate ovals anterior of vein M$_3$ and pale scaling anterior of vein R$_5$; postdiscal series very pale orange-cream (except silvery-grey in cell M$_2$-M$_1$), absent between anal margin and posterior half of cell Cu$_2$-Cu$_1$, present and completely separate in anterior half of cell Cu$_2$-Cu$_1$, completely fused anterior of vein Cu$_1$; postdiscal series separated from postdiscal band by heavy dark scaling in cell Cu$_2$-Cu$_1$, completely fused in cell Cu$_1$-M$_3$, and almost separated by darker scaling in cell M$_3$-M$_2$; inner submarginal series consisting of silver-grey dashes from cells 2A-Cu$_2$ to M$_1$-R$_5$, double in cell 2A-Cu$_2$, thickest in cell Cu$_2$-Cu$_1$, indented basally in cell Cu$_1$-M$_3$; outer submarginal series very faintly visible as silver-grey scaling, or paler ground colour, in same cells as inner series. *Hindwing*: ground colour orange-brown; basal third and area posterior of vein 2A whitish grey, dark red-brown line extending from tip of humeral vein through base of discal cell along vein 3A to anal margin, curving line extending from base of vein 2A to terminate at anal margin in middle of cell 3A-2A; 1st and 2nd discal cell bars darker brown, extending into cell Rs-Sc+R$_1$, area between them red-brown; postdiscal band white, reflecting that on dorsal surface; inner postdiscal series consisting of broad, whitish dashes in cells M$_1$-Rs and Rs-Sc+R$_1$, absent throughout remainder of wing; outer postdiscal series similar to inner but scarcely visible in cell Rs-Sc+R$_1$; inner submarginal series consisting of thin, even silver-grey dashes from tornus to apex; outer submarginal series visible as slightly paler ground colour, with faint whitish scaling in cells 2A-Cu$_2$ and Cu$_2$-Cu$_1$; slight paler orange scaling in tornus at basal edge of two black spots. *Head*: eyes dark brown with short setae in anterior half; dense white scales at ventral base of eyes; antennae black with white at ventral base and on ventral surface of basal few segments; labial palpi white with broad black inner and outer lateral stripe and dorsal surface, latter also with long black hairs; top of head with chestnut brown scales, frons with brown hairs. *Thorax*: dorsal surface black with short dark brown hairs, ventral surface greyish white with dark brown stripes where legs rest against thorax, legs white, mid and hindlegs with red-brown dorsal surface. *Abdomen*: dorsal surface black with short dark brown hairs, ventral surface white, then with dark grey lateral stripe, then white lateral stripe, spiracles ringed in white. *Genitalia*: saccus medium length, approximately two-thirds length valva; valva with slight ventral medial lobe, moderate dorsal basal and medial lobes; distal (posterior) tip of valva smoothly rounded except for 1-2 tiny bumps at dorsal edge, distal third of valva not tapering; clunicula pointed and high, extending dorsally of valva in lateral view.

FEMALE: unknown.

Types: ***Holotype*** ♂: BRAZIL: *Rio de Janeiro*: "Orgel-Gebirge (R. J.) Imbariê 25m 22.5.1980, *leg.* H. Ebert//Coleção H. Ebert//4460"; in the UFP. ***Paratype***: BRAZIL: **1**♂: "Petrópolis, Brazil//male genitalia prep. W.D.F. 6151//Adelpha fugela det. WTM Forbes 1963"; in the USNM.

Etymology: This species is named after the Atlantic coastal region of Brazil, an area to which it appears to be endemic and one that exhibits the highest endemism in *Adelpha* taxa.

Diagnosis: This taxon is perhaps most similar to *A. heraclea*, but is larger and differs in a number of wing pattern characters: on the DFW the orange in cell Cu$_1$-M$_3$ does not extend to fill the base of the cell, the orange covering the postdiscal band tapers sharply in cell Cu$_2$-Cu$_1$, so that the width of the band on the DFW in cell 2A-Cu$_2$ is equal to the width of the pale band on the VFW in this cell; on the VFW the upper postdiscal band is relatively more basally positioned, the marking in cell M$_3$-M$_2$ is broad and rounded at its basal edge, instead of being a small, triangular spot, the postdiscal spot at the base of cell Cu$_1$-M$_3$ is much smaller relative to the postdiscal spot in cell Cu$_2$-Cu$_1$ and is not separated from the inner postdiscal series by a solid red-brown line, the postdiscal series are fused in cell Cu_1-M_3 instead of being distinct, the postdiscal series in cell Cu_2-Cu_1 only extend half way across the cell, the postdiscal band is not bordered distally with red-brown in cell 2A-Cu_2; on the VHW the colours are more orange-brown than red-brown and the postdiscal series are not marked with pale dashes posterior of vein M_1. It differs from *A. malea goyama*, *A. fabricia* and *A. thesprotia*, and all other similar species, in having conspicuously swollen postdiscal series in cells M_1-Rs and Rs-Sc+R_1 on the VHW and a more orange-brown VHW, additionally from the *A. thesprotia* by having the postdiscal series separate in cell Cu_2-Cu_1, and from *A. capucinus* in lacking the orange subapical spot in cell M_2-M_1 on the DFW.

The male genitalia are distinctive in lacking spines at the distal tip of the valvae, which are present in the genitalia of *A. heraclea*, *A. malea*, *A. fabricia*, *A. capucinus* and *A. thesprotia*. The shape of the valva is most similar to *A. fabricia* and *A. capucinus*, being more elongate and lacking the pronounced ventral medial lobe of *A. heraclea* and *A. malea*. The species therefore has a number of wing pattern characters shared with *A. heraclea*, but a male genitalia more similar to those of *A. capucinus* and relatives, and may be intermediate between the *A. capucinus* group and *A. heraclea* and related species.

Discussion: *Adelpha atlantica* is broadly sympatric with *A. capucinus velia* and *A. malea goyama*, while the nearest known locality for *A. heraclea* is the Rio Doce drainage, around 300km to the north. Since other *Adelpha* taxa known from the Rio Doce do not differ at the subspecific level from those found in the Rio de Janeiro area (e.g., *A. capucinus velia*, *A. cocala didia*, *A. malea goyama*), there is no reason to suspect that *A. atlantica* may represent a subspecies of *A. heraclea*. In any case, the wing pattern and genitalic differences between the latter two taxa are much greater than between any known *Adelpha* subspecies, and indeed many species.

The paratype of this new species differs from the holotype in having very slightly more pronounced pale markings on the ventral surface, probably due to it being a fresher specimen, and a slightly more orange-suffused postdiscal band on the dorsal forewing in cell 2A-Cu_2. The latter variation suggests the possibility that this species may conform to local mimicry rings to the north and south of Rio de Janeiro, developing either an entire orange dorsal forewing postdiscal band (north), or one that is only half orange (south). Local lepidopterists should be aware of these possibilities in seeking this rare species.

Range: This species is known to my knowledge from only two specimens, from the Petrópolis area in southeastern Brazil, but it is probably more widespread throughout the latter region.

Habitat and adult ecology: Nothing is known of the natural history of this species. Although the only known localities lie in an area renowned for its high endemism in montane taxa, this species appears to be most closely related to exclusively lowland species, and it is therefore difficult to predict its habitat. Given the extensive habitat alteration in southeastern Brazil, and the obvious rarity of this species, I suggest its conservation status should be regarded as Vulnerable (see generic introduction for more discussion).

Specimens examined: 2 (2♂)

BRAZIL (2♂): *Rio de Janeiro*: Orgel-Gebirge Imbariê 25m May 1♂ UFP; Petrópolis 1♂ USNM.

Adelpha malea (C. & R. Felder, 1861)

Figs. **81**; 172; 252; *301*

Identification, taxonomy and variation:

Adelpha malea is distinguished from all similar species by the inner submarginal series on the VFW being composed of dashes of approximately equal size and shape in each cell, forming a row parallel to the distal margin. In other similar species (e.g., *Adelpha fabricia*, *A. atlantica*, *A. capucinus*, *A. jordani*) the spot in cell Cu_1-M_3 is smaller and basally displaced. Other notable characters include the usual absence of an orange DFW subapical spot in cell M_2-M_1; when this spot is present, it is isolated and smaller than that in cell M_1-R_5. This spot is present and equal in size or larger than that in cell M_1-R_5 in *A. capucinus*, *A. barnesia* and *A. diazi*. The postdiscal series on the VHW are composed of equal, pale, indistinct dashes in each cell, whereas *A. capucinus*, *A. heraclea*, *A. atlantica* and *A naxia* have enlarged dashes in cells M_1-Rs and Rs-Sc+R_1, while those in *A. pollina* are fused in cell Rs-Sc+R_1. The submarginal series on the VHW are typically represented throughout the wing by dashes of equal size, while the ground colour of the wing is an almost uniform reddish brown, darker between the postdiscal series. The postdiscal series are distinct and visible as two pale dashes in cell Cu_2-Cu_1 on the VFW, whereas these are fused to form a single spot in *A. messana*, *A. erotia*, *A. thesprotia*, *A. delinita* and *A. phylaca*. *Adelpha boeotia* is very similar to eastern subspecies of *A. malea*, but always has a solid, straight red-brown line cutting vertically through the pale VFW postdiscal band. Additional distinguishing features are discussed under the accounts of other species. There is geographic variation in the amount of orange on the DFW, and hence the colour of the postdiscal band in cells 2A-Cu_2 and Cu_2-Cu_1, an orange postdiscal band may be present distal of the white DHW postdiscal band, and the ventral ground colour varies slightly. Five subspecies are recognised.

Adelpha malea as treated here consists of several taxa regarded as distinct species by former authors, but the ventral pattern and male genitalia, with a noticeably short clunicula that does not extend above the dorsal surface of the valvae, indicate that they should be regarded as conspecific, as do their parapatric distributions and occasional intergrades. *Adelpha malea* has the divided postdiscal series on the VFW in cell Cu_2-Cu_1 typical of members of the *A. capucinus* group and *A. heraclea* and related species, and the male genitalic valvae, which have prominent distal spines and lack a pronounced dorsal medial lobe, are perhaps most similar to those of *A. boeotia*.

Range and status: Mexico to central Colombia, Venezuela to Bolivia, Paraguay, northeastern Argentina, southeastern Brazil and the western (possibly eastern also) Brazilian Amazon, and Trinidad. Lowland forest from sea level up to 1000m, not uncommon.

Specimens examined: 461 (397♂, 64♀)

Adelpha malea malea (C. & R. Felder, 1861)

Figs. **81a,b**; *301*

Heterochroa malea C. & R. Felder (1861: 109)

TL: Caracas, Venezuela. **Types**: **BMNH**(R): **ST**♀: "Syntype//Venezuela Moritz Type//Malea//Malea n.//64//Illustrated in The Butterflies of

Venezuela A. Neild, 1996" [examined]

Adelpha malea Fldr., Kirby (1871)

Identification, taxonomy and variation:

Adelpha malea malea is easily distinguished from all other subspecies by the orange postdiscal band bordering the distal edge of the white DHW postdiscal band. There is slight variation in the extent of orange suffusion in the white postdiscal band, which in some female specimens may be entirely uniform orange, in the presence or absence of orange scaling between cell bars two and four in the DFW discal cell, and in the depth of the "notch" at the basal edge of the DFW postdiscal band at vein M$_3$. A number of specimens are now known showing intergradation to *A. m. fundania* and these are discussed under that subspecies.

Felder & Felder (1861) described this species based on an unspecified number of male specimens in the collection of Kaden and Felder, collected in the province of Caracas by Dr. Moritz, and subsequently figured the dorsal surface (Felder & Felder, 1867: pl. 57, fig. 7). A syntype female is in the BMNH, corresponding well with the original description and figure. This is a distinctive taxon, but its relationships have always been misunderstood due the very poor quality of the type specimen and an emphasis on the presence of the orange DHW postdiscal band as a specific character. Both Hall (1933, 1938) and Lamas & Small (1992) regarded it as conspecific with *A. heraclea heraclea*, while Fruhstorfer (1915) described *A. leuceria juanna* as a subspecies of *A. malea*. It is perhaps unfortunate that the earliest named taxon of this species was so atypical in dorsal wing pattern, geographically restricted and so rare in collections that for some time it was known only from the damaged female syntype, and Neild (1996) was the first author to appreciate this taxon's true relationships. The characters that place this species with the following taxa are discussed under the identification of this species.

Range: This subspecies occurs in the eastern foothills of the Cordillera de Mérida in northwestern Venezuela, and has been recorded in the states of Barinas and Táchira. The single record from "Pará" is a mislabelling.

Immature stages: Andrés Orellana (pers. comm.) has reared this taxon in Barinas.

Habitat and adult ecology: This subspecies is very rare in collections, but according to Pyrcz (*In*: Neild, 1996) it can be rather common in the field. It has been recorded up to 800m. Andrew Neild (pers. comm.) once observed a male puddling along a forest road, unusual behaviour for this species.

Specimens examined (5♂, 3♀): † - trans. to *A. m. fundania*, thin orange at distal edge white DHW postdiscal band, postdiscal band on DFW pale orange from vein 2A-Cu$_1$.

VENEZUELA (5♂, 2♀): *Barinas*: Caimital 100m Dec. 1♀† AO(photograph); Quebrada Barragan Jan. J. Salcedo & K. Brown 1♂† MUSM; *Táchira*: Hda. Pánaga 800m Oct. 1♂ AFEN; Río Chucurí, San Cristóbal 800m Mar. 1♂ BMNH; Río Frío 600m Oct. 1♂ AFEN; San Cristóbal Aug. 1♂ AO(photograph); *Not located*: no specific locality 1♀ BMNH. "**BRAZIL**" (1♀): *Pará*: Braganza, coll. Miss. H.B. Merrill 1♀ USNM-error.

Adelpha malea aethalia (C. & R. Felder, 1867)

Figs. **81c,d**; 172c; 252a,b; *301*

Heterochroa aethalia C. & R. Felder (1867: 419)

TL: Bogotá, Colombia. **OTL**: Bogotá, Nova Granada [Colombia]; Venezuela; Ecuador. **Types**: **BMNH**(R): **LT**♂: "Type//Bogotá Lindig//Felder Colln.//Rothschild Bequest B.M. 1939-1//aethalia Felder//aethalia n.//Heterochroa aethalia C. & R. Felder, ♂ syntype det. R.I. Vane-Wright 1983//Illustrated in The Butterflies of Venezuela A. Neild, 1996//66" [examined]

=*Heterochroa davisii* Butler (1877b: 124) **syn. nov.**

TL: Ucayali, Peru. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9823 Heterochroa davisii ♂ Butl.//Peru 77.52//H. davisii Butl. Type//Type//Syntype"; **BMNH**(M): **ST**♂: "Ucayali Peru E. Bartlett//♂//B.C.A. Lep. Rhop. Adelpha erotia Hew. Godman-Salvin Coll. 1916.-4." [both examined]

=*Adelpha metaxa* Fruhstorfer (1913: pl. 106d; 1915: 517) **stat. nov.**

TL: [Peru; Upper Amazon]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1933-131//aethalia metana Fruhst.//Peru H. FruhstorferTYPE//Type//Syntype"; **BMNH**(R): **ST**♂: "aethalia metana Fruhst.//Pebas Amaz. January 1907 (M. de Mathan)//R" [both examined]

=*Adelpha frusina* Fruhstorfer (1913: pl. 106e; 1915: 517) **syn. nov.**

TL: [Province of Sara, Bolivia]. **Types**: **BMNH**(R): **ST**♂: "aethalia frusina Fruhst.//Syntype//Type//Prov. Sara, Dept. S. Cruz de la Sierra, March, April 1904 (J. Steinbach)//R"; 5**ST**?♂: Prov. Sara Dept. S. Cruz de la Sierra Feb.-May 1904 (J. Steinbach) [all examined]

=*Adelpha sarana* Fruhstorfer (1913: pl. 106c; 1915: 520) **stat. nov.**

TL: [Province of Sara, Bolivia]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1933-131//phylaca sarana Fruhst.//Boliv. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(R): **ST**?♂: "phylaca sarana Fruhst.//Prov. Sara Dept. S. Cruz de la Sierra March, April 1904 (J. Steinbach)//R"; 7**ST**?♂: Prov. Sara Dept. S. Cruz de la Sierra Feb.-May 1904 (J. Steinbach) [all examined]

=*Adelpha velia trinina* Kaye (1914: 555, pl. XXX, fig. 2) **syn. nov.**

TL: Diego Martin, Trinidad. **Types**: **AME**: **HT**♂: "TYPE//Trinidad//A. trinina Kaye//Diego Martin" [examined]

=*Adelpha incomposita* Austin & Mielke (1993: 124) **syn. nov.**

TL: Fazenda Rancho Grande, 62 km S. Ariquemes, linea C-20, 7 km E. B-65, Rondônia, Brazil. **Types**: **UFP**: **HT**♂: Fazendo Rancho Grande 180m 21 Apr. 1991 [original photograph examined]; **GTA**: **PT**♂: same locality data as HT, 19 Apr. 1991 [not examined]

Adelpha thesprotia var. *aethalia* Fldr., Kirby (1871); *Adelpha erotia* Hew., Staudinger (1886) misid.; *Adelpha phylaca aethalia* Fldr., Hall (1938); *Limenitis aethalia metana* Fruhst., Brown & Mielke (1967); *Adelpha phylaca* form *frusina* Fruhst., D'Abrera (1987); *Adelpha malea aethalia* Fldr., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. m. goyama* by specimens typically being slightly larger, the ground colour of the VHW being a more purplish brown, instead of dull reddish brown, particularly along the distal margin and immediately distal of the white postdiscal band, the white postdiscal bands are broader, particularly on the DFW, and typically the orange on the DFW extends at least into cell 2A-Cu$_2$, usually to the anal margin. In *A. m. goyama*, the postdiscal band is always white from the anal margin to the middle of cell Cu$_2$-Cu$_1$. There is some variation in the presence or absence and size of the orange subapical spot on the DFW in cell M$_2$-M$_1$, in the ground colour of the ventral surface which may be orange-brown or reddish brown, in the definition of the VFW inner submarginal series, and in the amount of white in the DFW postdiscal band. Specimens from southern Peru and Bolivia have varying amounts of white between the anal margin and the middle of cell Cu$_2$-Cu$_1$, with forms with the most white occurring in Bolivia. These seem to be sympatric with typical forms with the entire DFW band orange, and this is discussed further below.

Adelpha m. aethalia was described as a distinct species by Felder & Felder (1867) from specimens collected in Bogotá by Lindig, in Venezuela by Dr. Moritz, and in Ecuador, and they compared it with *A. thesprotia*. A syntype male in the BMNH with appropriate label data is here designated as the lectotype to avoid the possibility that other syntypes may be discovered that are not referable to this taxon. This lectotype corresponds to the concept of all subsequent authors of this taxon, and bears the following data: "Type//Bogotá Lindig//Felder Colln.//Rothschild Bequest B.M. 1939-1//aethalia Felder//aethalia n.//Heterochroa aethalia C. & R. Felder, ♂ syntype det. R.I. Vane-Wright 1983//Illustrated in The Butterflies of

Venezuela A. Neild, 1996//66". The lectotype has a ventral surface which has an uncommonly pale orange-brown ground colour, probably causing many of the names regarded here as synonyms to be retained in the past by more conservative authors, but this character falls well within the bounds of normal variation in the taxon and is confined to no geographic area. Butler (1877b) described *davisii* based on an unspecified number of specimens captured by Davis in Peru, on the Ucayali, and compared it to *A. erotia*, stating that it differed in lacking the orange subapical spot in cell M_2-M_1 on the DFW, in having a tapering orange postdiscal band and a duller ventral surface. He was apparently unaware of the identity of *A. m. aethalia*, from which the syntypes barely differ, and I therefore synonymise *davisii* with *aethalia* (**syn. nov.**). Fruhstorfer (1913) figured two new taxa, *metaxa* and *frusina*, the former based on a specimen from the Upper Amazon, the latter on a specimen from Sara Province in Bolivia (Fruhstorfer, 1915). Fruhstorfer (1915) placed both names as subspecies of "*A. aethalia*" and stated that the former, misspelt *metana*, was also based on specimens from Peru, and was distinguished by its heavier white on the DFW and darker ventral surface, while *frusina* was distinguished by its faded ventral surface. I have examined syntypes of both these names and none of these differences constitute anything more than individual variation, so I synonymise both *metaxa* and *frusina* with *aethalia* (**stat. nov.**, **syn. nov.**). The taxon *sarana* was described by Fruhstorfer (1915) as a subspecies of *A. phylaca*, and figured two years earlier as a good species (Fruhstorfer, 1913). Hall (1938) regarded it as being the white form of *A. capucinus*, which he misidentified as *A. thesprotia*. However, it differs from *frusina* only in having the orange on the DFW terminate in the middle of cell Cu_2-Cu_1, with the postdiscal band white from there to the anal margin. I regard this as variation of a similar kind to that seen in *A. capucinus*, since a series of nine potential syntypes in the BMNH all show some variation in the extent of the orange, while forms with more white in the postdiscal band occur more commonly in southern Peru. One possibility for this observed variation might be a change in the composition of the *Adelpha* faunas with which this species is involved in mimicry in southern Peru and Bolivia. Another possibility is that there is some intergradation with *A. malea goyama*, which differs from this form as discussed above. The ventral surface, however, has all the diagnostic characters of this species, and I therefore synonymise *sarana* with *aethalia* (**stat. nov.**). Kaye (1914) described *trinina* as a subspecies of *A.* (*capucinus*) *velia*, based on a specimen collected in Trinidad at Diego Martin by Carraciolo. The specimen labelled as "Type" in the AME agrees very closely with that figured and I deem it to be the holotype. This specimen, and most from Trinidad, have slightly faded pale markings and a more orange-brown ground colour on the ventral surface, and the outer postdiscal series is usually separate from the inner in cell Cu_1-M_3, but they have all the diagnostic characters of this species, and *trinina* was placed as a subspecies of *A. malea* by Neild (1996). However, I regard the differences exhibited by Trinidadian specimens to be too variable and slight to merit their recognition as a distinct subspecies, and synonymise *trinina* with *aethalia* (**syn. nov.**). Austin & Mielke (1993) described a new species, *A. incomposita*, based on two specimens with a rather distinctive appearance from Rondônia in Brazil. The holotype differs from typical *A. m. aethalia* in having the postdiscal band on both wings extended basally, so that the basal edge of the upper postdiscal band on the DFW is along the postcellular bar, the basal edge of the lower postdiscal band is aligned with the fourth discal cell bar, and the basal edge of the hindwing postdiscal band is aligned with the third discal cell bar, creating a "notch" on the basal edge at the distal end of the discal cell. Although Austin & Mielke (1993) state that the ventral colour is darker than in *A. m. aethalia*, this colour is variable and I have seen equally dark specimens from elsewhere in the range, including Ecuador. Otherwise the markings are typical of *A. m. aethalia*. All of the differences apparent in the holotype are therefore caused by basal expansion of the postdiscal band, which I regard as an aberration in the two type specimens, collected at the same site within a two day period, and probably originating from eggs laid by a single female. The postdiscal band is clearly phenotypically plastic since it shows much variation in width in many species, this phenotype has never been reported elsewhere in South America, even though no *Adelpha* are known to be restricted to a single area of the Amazon basin, and no further specimens have been collected at the type locality (G. Austin, pers. comm.), despite it being subject to the most intensive lepidopterological survey ever conducted in the Neotropics. The lack of further specimens is even more surprising given the extensive trapping with rotting fish, on which the type specimens were collected. I am grateful to George Austin for providing me with a drawing of the male genitalia, and I can confirm that it does not differ from typical *A. m. aethalia*. I therefore regard *incomposita* as a synonym of *aethalia* (**syn. nov.**).

Range: *Adelpha m. aethalia* is known from southeastern Colombia to central Bolivia, in the upper Amazon basin in Brazil, and from Trinidad. It almost certainly occurs in southern Venezuela, and possibly Guyana. A single record from Pará requires confirmation.

Habitat and adult ecology: This subspecies is not uncommon in the west of its range, but appears to be very rare further east into the Amazon basin, if the few known records are valid. It is restricted to intact or slightly disturbed lowland rain forest up to 700m, where it flies throughout the year. In eastern Ecuador, I have encountered males typically in light gaps in logged primary forest, where they may be readily attracted to rotting fish, and I have seen a single male perching in a large streamside clearing in primary forest with its wings open, 3-4m above the ground, at midday. I also once observed a single male puddling on damp mud at the forest edge. According to Matthew Cock (pers. comm.), the species is occasional to rare in Trinidad.

Specimens examined (150♂, 14♀): † - thin orange distal to DHW white postdiscal band, trans. to *A. m. malea*; ‡ - DFW postdiscal band white to mid cell Cu_2-Cu_1.

COLOMBIA (31♂, 1♀): *Amazonas*: Puerto Nariño Dec. 1♂ LMC; "*Boyacá*": Muzo 2♂, 1♀ AME-error; *Caquetá*: San Vicente 1♂ USNM; *Cundinamarca*: Bogotá 11♂ BMNH, 1♂ BMB; Cupiagua Casanare May 1♂ JFL; *Meta*: Restrepo Jul. 1♂ JFL; San José Guaviare Jun. 1♂ JFL; San Martín 1♂ BMNH; Villavicencio Dec. 2♂ AMNH, 1♂† LMC; *Putumayo*: Mocoa Jul. 1♂ JFL; Umbría 2♂ AMNH; *Not located*: no specific locality 3♂ AMNH, 2♂ ZMHU. **ECUADOR** (22♂): *Napo*: Apuya 600m Feb. Sep. 3♂ KWJH; Coca, 30 km S.W., Apr. 3♂ MJP; Coca-Loreto rd., km 21, 300m Mar. 1♂ KWJH; Pimpilala 600m Sep. 2♂ KWJH; Río Tiputini Mar. 1♂ KWJH; Satzayacu 700m Apr. Sep. 1♂ KWJH, 1♂ DAT, 3♂ MJP; *Pastaza*: Pastaza 1♂ BMNH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Oct. Nov. 2♂ PJD; Limoncocha Feb. 1♂ USNM; *Not located*: E. Ecuador 1♂ USNM; no specific locality 1♂ MNHN, 1♂ USNM. **PERU** (40♂, 2♀): *Huánuco*: Las Palmas 450m Aug. 1♂ AME; Tingo María Mar. May 3♂ AME; Tournavista 1♂ AME; *Junín*: Satipo Sep. Nov. 1♂ BMNH, 1♂ AME; *Loreto*: Arcadia 340m Nov. 1♂ MUSM; Castaña 150m Oct. 1♂ MUSM; Pebas Jan. 2♂ BMNH, 1♂ ZMHU; Río Morona Jan. 1♂ AMNH; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Boca Río La Torre 300m Oct. 1♂ MUSM; Pakitza 340-400m Oct. Nov. 5♂, 2♀ MUSM; Puerto Maldonado 250m Aug. 1♂ AME; Puerto Maldonado, 30 km S.W., Oct. 1♂ USNM; Río Tambopata 270m Aug. 1♂ MUSM; *Pasco*: Pichis Rd. 1♂ BMB; *San Martín*: Achinamiza Oct. 1♂

AMNH; Jepelacio 5♂ AMNH; Juanjuí Oct. 1♂ BMNH; Tarapoto 1♂ BMNH; *Not located*: Río Huallaga 1♂ AMNH; upper Río Marañón Sep. 3♂ AMNH; Ucayali 1♂ BMNH; no specific locality 2♂ BMNH, 1♂‡ USNM. **BOLIVIA** (24♂): *La Paz*: Río Chimato Apr. 1♂ AMNH; *Santa Cruz*: Buenavista Mar. 2♂ AME; Bueyes 1♂ ZMHU; Prov. Sara Feb.-May 14♂ BMNH, 1♂ BMB; Juntas 300m 3♂ ZMHU; *Not located*: no specific locality 1♂ BMNH, 1♂ AMNH. **BRAZIL** (24♂, 3♀): *Amazonas*: Madeira 1♂ USNM; São Paulo de Olivença 1♂ ZMHU; *Pará*: Pará Oct. 1♂ MCZ; "*Paraná*": no specific locality 1♂ AMNH-error; *Rondônia*: Cacaulândia 200m Apr. Oct. Nov. Dec. 1♂ FSCA, 16♂, 2♀ AME, 1♂, 1♀ USNM, 2♂ KWJH. **TRINIDAD** (6♂, 8♀): *St. George*: Arima District Jan.-Mar. 1♀ BMB; Maraval Nov.-Feb. 1♀ BMB; St. Anns Jan.-Mar. 1♀ BMB; *St. Patrick*: Siparia Oct.-Dec. 2♀ BMB; *Not located*: Northern Mts. Dec.-Jan. 1♂, 1♀ BMB; no specific locality Nov. 1♂, 1♀ BMNH, 4♂, 1♀ AME. **COUNTRY UNKNOWN** (3♂): no specific locality 1♂ BMB, 2♂ USNM.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Miriumi Oct.; *Napo*: Apuya Aug. Oct. Dec.; Finca San Carlo Sep.; Tiputini Biodiversity Station 300m Aug.; Yarina Jul.; Yasuní Jul. (Willmott & Hall, sight records). **BRAZIL**: *Distrito Federal*: Brasília Country Club Jun.; Chapada da Contagem 900m Feb.; Jardim Zoológico 1000m Feb. Jun.; *Goiás*: Chapada dos Veadeiros 1000m; Leopoldo Bulhões 1000m Dec. (Brown & Mielke, 1967). **TRINIDAD**: *St. Andrew*: Brigand Hill 850' Oct.; Mt. Tamana Oct.; *St. Patrick*: Parrylands Jul.; *Victoria*: Moruga East Feb. (M. Cock, pers. comm.).

Adelpha malea goyama Schaus, 1902 **stat. nov.**

Figs. **81e,f**; *301*

Adelpha goyama Schaus (1902: 395)

TL: Castro, Paraná, Brazil. **Types**: **USNM**: **HT**♂: "Adelpha goyama type Schs//Collection W. Schaus//Castro Paraná//Type No. 5890 U.S.N.M."; **PT**?♂: "Pa'guay//Type no. 190 U.S.N.M." [both examined]

=*Adelpha leopardus* Fruhstorfer (1913: pl. 106d; 1915: 520)

TL: Espírito Santo, Rio de Janeiro, Santa Catharina [Brazil]; Cochabamba [Bolivia]. **Types**: **BMNH**(M): **ST**♂: "Espírito Santo, Brasil ex coll. Fruhstorfer//Syntype//Fruhstorfer Coll. B.M. 1937-285//Syntype ♂ Adelpha leopardus Fruhstorfer G. Lamas det. 1987"; **ST**♂: "Bolivia Speiyes[?illegible] 99//euboea//106 d1//leopardus//Fruhstorfer Coll. B.M. 1937-285"; **ST**♂: "Bolivia Speiyes[?illegible] 99//euboea//106 d2//leopardus//Fruhstorfer Coll. B.M. 1937-285"; **ST**?♂: "5 days north from Cochabamba Bolivia Sep. 12, 1899//Fruhstorfer Coll. B.M. 1937-285" [all examined]

Adelpha goyama Schs., D'Abrera (1987); *Adelpha phylaca goyama* Schaus, Mielke & Casagrande (1997)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account. Typically, also, the distal edge of the orange marking in cells Cu_2-Cu_1 and Cu_1-M_3 on the DFW is parallel to the wing margin, whereas in *A. m. aethalia* the distal edge is more basal in cell Cu_2-Cu_1, so that the dark brown line immediately bordering the orange is also thicker in cell Cu_2-Cu_1 than Cu_1-M_3. However, very occasionally the orange in cell Cu_2-Cu_1 may be reduced, as in a single male from "Rio" in the BMB.

Schaus (1902) described this taxon as a species based on a specimen from Castro in Brazil, and the holotype is in the USNM. He also referred to specimens in the collection of Godman from Paraguay, but it is unclear if the specimen in the USNM with a type label is one of these, or has been mislabelled later. Fruhstorfer (1913) figured both surfaces of the taxon under the new name *leopardus*, which he subsequently (Fruhstorfer, 1915: 520) stated to be synonymous with *goyama*. Fruhstorfer (1915) stated that he had specimens in his collection from a number of localities (see under TL above), but those on which the figure were based appear to the Bolivian specimens. All specimens clearly belong to this taxon so a lectotype designation is unnecessary.

Most previous authors (Fruhstorfer, 1915; Hayward, 1951; D'Abrera, 1987) have regarded this taxon as a distinct species, but it possesses all of the diagnostic characters of *A. malea*, the genitalia do not differ, it is closely allopatric and forms from Bolivia of *A. m. aethalia* show possible evidence of intergradation, and I therefore place *goyama* as a subspecies of *A. malea* (**stat. nov.**).

Range: This subspecies is known from eastern Bolivia through Paraguay and northeastern Argentina to southeastern Brazil, east to Espírito Santo and south to Santa Catharina.

Habitat and adult ecology: This subspecies is common in collections and presumably in the field, apparently flying throughout the year up to at least 600m. The dorsal wing pattern is convergent on numerous sympatric *Adelpha* taxa with which this species is probably involved in mimicry.

Specimens examined (144♂, 15♀):

"**VENEZUELA**" (1♂): *Mérida*: Mérida 1♂ MNHN-error. "**PERU**" (2♂): *Junín*: Chanchamayo 2♂ AMNH-error. **BOLIVIA** (3♂): *Cochabamba*: 5 days N. Cochabamba Sep. 1♂ BMNH; *Not located*: Speiyes[?illegible] 2♂ BMNH. **BRAZIL** (77♂, 12♀): *Espírito Santo*: Linhares May Jul. Aug. 1♂, 2♀ AME; no specific locality 1♂ BMNH; *Mato Grosso*: no specific locality 1♀ MCZ; *Mato Grosso do Sul*: Nivac 1♂ BMNH; *Minas Gerais*: Parque Rio Doce Jul. 1♂ AME; Passa Quatro May 1♀ BMB; "*Pará*": Óbidos Jan. 1♂ AME-error; *Paraná*: Castro 2♂ BMNH; Caviuna 2♂, 3♀ AMNH; Iguaçu Feb. 4♂ BMNH; N. Paraná 9♂, 1♀ AMNH; no specific locality 4♂ AMNH; *Rio de Janeiro*: Itabapoana 1♂ BMB; Petrópolis 1♀ BMNH; Rio de Janeiro 1♂ BMNH, 1♂ BMB; *Santa Catharina*: Campos Novos 2♂ AME; Cauna Apr. 1♂ AMNH; Corupá 1♀ AMNH; Rio Vermelho 1♂, 1♀ AMNH; *São Paulo*: Anhangahy Nov. 3♂ BMNH; Araçatuba 450m Mar. Apr. 3♂ BMNH, 2♂ AMNH; Bahuru 6♂ BMNH; Casa Branca 3♂ BMNH, 6♂, 1♀ ZMHU; Indiana 2♂ AMNH; São Paulo 9♂ MCZ, 4♂ BMNH, 1♂ FSCA, 1♂ USNM; Teodoro Sampaio, 17 km W., 600m Mar. 1♂ USNM; *Not located*: Caryoa 1♂ BMB; no specific locality 1♂ BMNH, 1♂ MCZ. **PARAGUAY** (51♂, 2♀): *Alto Paraná*: S. Cajarville, Río Iguaçu Dec. 1♂ MCZ; *Caaguazu*: Yhú Sep. Dec. 5♂ BMNH; *Caazapá*: Buenavista Feb. 2♂ MCZ; *Central*: Asunción 6♂ MNHN; Sant. Trinidad May 1♀ AMNH; *Guaíra*: Colonia Independencia Sep. 3♂ AME; *Paraguarí*: Sapucay Sep. Oct. 4♂ BMNH, 1♂ BMB; *San Pedro*: San Pedro 1♂ USNM; Río Jejuy 3♂ BMB; *Not located*: Central Paraguay 3♂ BMNH; S. Paraguay 4♂ BMNH; no specific locality 6♂, 1♀ BMNH, 2♂ ZMHU, 8♂ BMB, 1♂ MNHN, 1♂ USNM. **ARGENTINA** (2♂, 1♀): *Misiones*: Puerto Aguirre Jan. 1♂ BMNH; no specific locality Apr. 1♂ BMNH; *Not located*: Trinidad 1♀ USNM. **COUNTRY UNKNOWN** (8♂): no specific locality 1♂ ZMHU, 1♂ BMB, 6♂ MNHN.

Additional locality data: **BRAZIL**: *São Paulo*: Parque Estadual Morro do Diabo (Mielke & Casagrande, 1997). **PARAGUAY**: *Amambay*; *Canindeyú*; *Itapúa* (Kochalka *et al*., 1996).

Adelpha malea ixia (C. & R. Felder, 1867) **stat. nov.**

Figs. **81g,h**; *301*

Heterochroa ixia C. & R. Felder (1867: 418)

TL: Venezuela. **Types**: **BMNH**(R): **ST**♂: "Syntype//Venezuela. Moritz//ixia Felder//Ixia n." [examined]

=*Heterochroa himera* C. & R. Felder (1867: 418) **syn. nov.**

TL: Venezuela. **Types**: **BMNH**(R): **ST**♀: "Syntype//Type//Venezuela type//Felder Colln.//Himera n.//Himera Felder//Illustrated in The Butterflies of Venezuela A. Neild, 1996//140" [examined]

Adelpha lerna var. *ixia* Fldr., Kirby (1871); *Adelpha lerna* var. *himera* Fldr., Kirby (1871); *Adelpha velia himera* Fldr., Fruhstorfer (1915); *Adelpha ixia ixia* Fldr., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from all others, except *A. m. fundania*, by having the orange DFW subapical area entirely isolated from the white DFW postdiscal band. It differs from *A. m. fundania* in having broader white postdiscal bands, typically heavier pale postdiscal and submarginal markings on the ventral surface and a smaller orange spot on the DFW in cell Cu_1-M_3. The size of the latter spot is slightly variable, and the upper postdiscal band in cells M_2-M_1 and M_1-R_5 on the DFW varies from yellow to pale yellow, to completely white in a single female in the BMB, which bears an unpublished Arthur Hall manuscript name, ixora.

Felder & Felder (1867) described this taxon in comparison with "*A. lerna*", based on an unspecified number of male specimens collected in Venezuela by Dr. Moritz, and a syntype is in the BMNH. Shortly after they described another species, *himera*, also based on an unspecified number of male specimens collected by Dr. Moritz in Venezuela. The syntype in the BMNH differs from the syntype of *A. m. ixia* in having, on the DFW, a broader orange marking in cells Cu_1-M_3 and M_3-M_2, a small orange subapical spot in cell M_2-M_1, and a white postdiscal spot in cell Cu_1-M_3. Neild (1996) figured the specimen and treated it as a distinct species, but discussed at length its similarity on the ventral surface to *A. m. ixia* and the possibility that it might prove to be a form of that taxon. No further similar specimens appear to have ever been collected. In fact, the only differences apparent between *A. m. ixia* and the syntype of *himera* are the increased DFW orange and white spot in cell Cu_1-M_3 on the DFW. As Neild (1996) suggested, these might possibly be the result of intergradation of *A. m. ixia* and *A. m. aethalia*, which occurs in eastern and probably northeastern Venezuela. Since both characters occur in other subspecies of *A. malea* and the diagnostic ventral characters are otherwise identical, I regard *himera* as an aberration or intergrade form and therefore synonymise it with *A. m. ixia* **(syn. nov.)**.

The name *ixia* has historically been applied to at least three species, *A. messana messana*, *A. barnesia leucas*, and *A. malea ixia*, and it was Neild (1996) who first recognised that the three taxa were distinct species (see discussions under each taxon). Neild (1996) also regarded *ixia*, with *fundania*, as constituting a species separate from *A. malea*, although he recognised the possibility that the two might prove to be conspecific. I regard *ixia* as a subspecies of *malea* (**stat. nov.**) for the reasons discussed below under *A. malea fundania*.

Range: Cordillera de la Costa in northern Venezuela.

Habitat and adult ecology: Neild (1996) reports that this taxon and *fundania* are common from sea level to at least 900m, though this may apply only to the latter subspecies. The broad white bands are typical of the regional mimicry complex to which this taxon belongs, and the form with a white upper postdiscal band is particularly similar to forms of *A. b. leucas*, *A. erotia caphira* form "lerna" and *A. paraena reyi*.

Specimens examined (7♂, 6♀):
VENEZUELA (7♂, 6♀): *Aragua*: Pozo del Diablo, Maracay 420m Jul. 2♂ AME; *Carabobo*: Puerto Cabello 1♂ ZMHU; *Distrito Federal*: Caracas 3000' Sep. Oct. 1♀ BMNH, 1♀ AME, 1♀ BMB; *Guárico*: Los Morros de Macaira, N.E. of Altagracia de Orituco, 800m Dec. 3♂ AFEN, 2♀ BMNH; *Not located*: no specific locality 1♂, 1♀ BMNH.

Adelpha malea fundania Fruhstorfer, 1915 **stat. nov.**

Figs. **81i,j**; 172a,b; *301*

Adelpha ixia fundania Fruhstorfer (1915: 525)

TL: Colombia. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//147//Fruhstorfer Coll. B.M. 1937-285//ixia fundania Fruhst.//Columbien ex coll. H. Fruhstorfer//TYPE//Type// Syntype"; **BMNH**(M): **ST**♂: "Colombie Collection Le Moult//Columbien ex coll. H. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1933-131" [both examined]

Adelpha aff. *ixia* Fldr., de la Maza & de la Maza (1993) ?; *Adelpha ixia fundania* Fruhst., Neild (1996)

Identification, taxonomy and variation:

Adelpha m. fundania is distinguished from *A. m. ixia* under that subspecies. Central American specimens of this subspecies tend to have a larger orange spot in cell Cu_1-M_3 on the DFW, which is joined to the orange marking in cell M_3-M_2, while Colombian specimens have a smaller and isolated spot. However, these differences are small and slightly variable, and do not merit subspecific recognition.

Fruhstorfer (1915) described this taxon based on an unspecified number of specimens from Colombia, in comparison with *A. m. ixia*, and later figured it (Fruhstorfer, 1916: pl. 109b). I have examined two syntypes in the BMNH (Fig. 81i,j). Although Hall (1938) synonymised the name with *A. ixia ixia*, Neild (1996) correctly reinstated it.

Neild (1996) regarded *fundania* and *ixia* as constituting a species distinct from remaining *A. malea* subspecies, but discussed the evidence indicating that they might prove to be conspecific. The ventral surfaces of all these taxa do not differ in any respect except where related to the dorsal surface pattern, which affects the amount of red-brown scaling around the VFW postdiscal band. The male genitalia also show no consistent differences. Subspecies of *A. malea* east of the Andes are closely parapatric with *ixia* and *fundania*, while specimens clearly intermediate between *A. malea malea* and *A. malea fundania* are known from the southeastern and northeastern foothills of the Cordillera de Mérida in Venezuela, where gene flow presumably occurs around the northern and southern tips of the mountain range. At Caimital, in Barinas, Andrés Orellana (pers. comm.) found specimens of typical *A. malea malea*, except with reduced orange on the DHW and a paler DFW postdiscal band in cells 2A-Cu_2 and Cu_2-Cu_1, *A. malea fundania*, and specimens clearly intermediate between these two phenotypes, resembling the latter but with a very thin orange line at the distal edge of the white DHW postdiscal band and thicker orange at the distal edge of the white DFW postdiscal band. Neild (1996: pl. 2, figs. 61-63) figured two transitional specimens from Táchira and Mérida, which show a reduction in the orange DHW postdiscal band typical of *A. malea malea* and a white DFW postdiscal band in cells Cu_2-Cu_1 and Cu_1-M_3, bordered by thin orange scaling. The postdiscal spot at the base of cell Cu_1-M_3 on the VFW of eastern *A. malea* subspecies is visible as a small dot joined to the postdiscal series by silvery grey scaling in some specimens of *A. m. ixia* (e.g., Neild, 1996: pl.4, fig. 146), while it is well developed in the syntype of *himera*, so I do not regard this as a specific character. Finally, there are many examples in *Adelpha* of geographic and local variation in the amount of orange on the DFW, such as the two forms of *A. erotia*, *A. capucinus*, and southern *A. malea aethalia*. The extent of orange on the DFW appears to be a highly variable character which responds to selection imposed through mimicry with sympatric species, and I therefore regard *ixia* and *fundania* as subspecies of *A. malea* (**stat. nov.**).

Range: *Adelpha m. fundania* occurs from central Mexico to northwestern Venezuela west of the Cordillera de Mérida, and although it has yet to be recorded from western Colombia and western Ecuador, it almost certainly occurs there.

Habitat and adult ecology: This subspecies is not uncommon throughout its range and has been recorded up to at least 1000m. De la Maza & de la Maza (1985) and de la Maza & de la Maza (1993) report a species as "*A.* aff. *ixia*" from Chiapas, in Mexico, which could be this taxon, from 100-900m in lowland rain forest, while DeVries' (1987) comments are similar for "*A. ixia leucas*" in Costa Rica. While the specimens figured by DeVries are actually *A. barnesia leucas*, the observations probably also apply to this species, as they appear equally common in the field. One male in the USNM was apparently collected at a blacklight in Venezuela.

Specimens examined (92♂, 26♀): † - trans. to *A. malea malea*, thin orange at distal edge of white DFW and DHW postdiscal bands.
MEXICO (31♂, 18♀): *Chiapas*: Comitán Jun. 1♂ AME; La Granja 1♀ AMNH; San Jerónimo 450m Jul. 1♂ FSCA; *Oaxaca*: Chiltepec Aug. 2♂ AME; Chimalapa Aug. 2♂ AME; El Naranjal Chiltepec May Oct. 2♂ AMNH; Piadre de Colón? 3♂ AME; Tuxtepec 1♂ AME; *Quintana Roo*: X-Can Jul. Aug. 4♂, 1♀ AME, 1♂ MUSM; no specific locality Sep. 1♂ BMNH; *Veracruz*: Córdoba Mar. 1♀ USNM; Motzorongo Jun. 2♂ USNM; Orizaba 1♀ USNM; Papantla Dec. 1♀ AME; Presidio Aug. 1♀ AME; *Yucatán*: Pisté Jul.-Sep. 6♂, 12♀ AME; *Not located*: no specific locality 4♂ AMNH, 1♂ MNHN. **GUATEMALA** (3♂, 1♀): *Alta Verapaz*: forests of N. Vera Paz 1♂ BMNH; *Escuintla*: Escuintla Jul. Aug. 1♂ BMB; Palín Jul. Aug. 1♀ BMB; Zapote 1♂ BMNH. **HONDURAS** (4♂): *Cortés*: San Pedro Sula 2♂ BMNH; *Not located*: no specific locality 1♂ BMB, 1♂ MCZ. **NICARAGUA** (4♀): *Chontales*: Chontales 2♀ BMNH; *Not located*: no specific locality 2♀ BMNH. **COSTA RICA** (3♂, 1♀): *Alajuela*: San Mateo 1♀ USNM; *San José*: Carrillo 1♂ BMNH; *Not located*: no specific locality 1♂ BMB, 1♂ MNHN. **PANAMA** (5♂, 1♀): *Darién*: Caña 1000m Jul.-Sep. 4♂ USNM; *Not located*: Cord. San Blas 330m Dec. 1♀ USNM; S. Lorenzo 1♂ BMNH. **COLOMBIA** (39♂, 1♀): *Boyacá*: Muzo 1♂ AME; *Caldas*: Victoria 2400' Feb. 1♂ USNM; *Cundinamarca*: Bogotá 24♂ BMNH, 2♂ USNM; La Mesa 4000' May Jun. 1♂ BMB; *Santander*: El Centro 1♂ AMNH; *Not located*: Pipiral 1♂ MNHN; W.

Colombia 1♂ BMB; no specific locality 2♂ AMNH, 2♂ USNM, 1♂ BMNH, 2♂, 1♀ ZMHU. **VENEZUELA** (3♂): *Barinas*: Caimital 100m Nov. 2♂(1†) AO(photograph); *Zulia*: El Tucuco (blacklight, *leg.* Heppner) Jan. 1♂ USNM. "**PERU**" (1♂): *Loreto*: Pebas 1♂ MCZ-error. **COUNTRY UNKNOWN** (2♂): Panamá or Costa Rica 1♂ USNM; no specific locality 1♂ MCZ.

Additional locality data: **MEXICO**: *Chiapas*: El Chorreadero Mar. Oct. 700m (Beutelspacher, 1983); Bonampak May Aug.; *Oaxaca*: Laguna de Chacahua Jan.; Naranjal Chiltepec Jul.-Aug.; Rancho Ojoche Jun.; San Martín Soyolapan Oct.; *Veracuz*: Catemaco Oct.; El Vigía Jul.–Sep.; Santiago Tuxtla Sep.; *Yucatan*: Pisté Aug. (A. Luis, pers. comm., specimens in the UNAM).

Adelpha boeotia (C. & R. Felder, 1867)

Figs. **82**; 173; 253; *302*

Identification, taxonomy and variation:

This species is distinguished from similar species by the straight, vertical, solid red-brown line cutting through the pale postdiscal area on the VFW (similar lines occur in some other species but are diagonal or curving). Actually, this line represents the ground colour between the inner postdiscal series and the postdiscal band. The postdiscal series are variably fused, but there is always some trace of red-brown scales dividing the two series in certain cells, particularly Cu$_2$-Cu$_1$ and M$_2$-M$_1$, which distinguishes the species from *A. erymanthis*, *A. sichaeus* and all members of the *A. phylaca* group except *A. pollina*. In Central American specimens, the outer postdiscal series is often a silvery grey dash barely visible next to the pale yellow inner postdiscal series dash in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ on the VFW. Other useful distinguishing characters are the evenly sized subapical spots on the DFW in cells M$_2$-M$_1$ and M$_1$-R$_5$, with that in cell M$_2$-M$_1$ displaced distally so that its basal edge is aligned with the distal edge of the orange band in cell M$_3$-M$_2$ (see *A. capucinus*, in which the spot is much more basal, and *A. malea* and *A. heraclea* in which it is reduced in size or absent), the basally displaced silvery grey submarginal marking on the VFW in cell Cu$_1$-M$_3$ (not displaced basally in *A. malea*) and the even, indistinct, pale postdiscal series on the VHW which are not more pronounced in cells M$_1$-Rs and Rs-Sc+R$_1$ (see *A. heraclea*, *A. capucinus* and *A. erymanthis*) or fused in Rs-Sc+R$_1$ (see *A. pollina*). *Adelpha jordani* is further distinguished by its smaller size, rounder hindwings, more pronounced VHW postdiscal series which are noticeably displaced basally in cell M$_3$-M$_2$, and reduced orange subapical spot in cell M$_2$-M$_1$ on the DFW, while *A. cocala* has the VFW postdiscal series heavily obscured by darker orange scaling.

The male genitalia of this species, in which the valvae lack a pronounced dorsal medial lobe, have only a few, well developed spines at the posterior tip, and have a relatively short, blunt clunicula, suggest that the species is most closely related to *A. naxia*, *A. heraclea* and *A. malea*.

Range and status: Mexico to western Ecuador, Venezuela to Bolivia and southwestern Brazil, the Guianas, and a subspecies represented by a single specimen from southeastern Brazil. Uncommon, very locally common, in lowland to premontane rain forest, from around 100m to 2000m.

Specimens examined: 438 (425♂, 13♀)

Adelpha boeotia boeotia (C. & R. Felder, 1867)

Figs. **82a,b**; 173c; 253a,b; *302*

Heterochroa boeotia C. & R. Felder (1867: 422)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Bogotá Lindig//Felder Colln.//Boeotia n.//Boeotia Felder//54//Illustrated in The Butterflies of Venezuela A. Neild, 1996" [examined]

=*Adelpha boeotia fulica* Fruhstorfer (1915: 517) **syn. nov.**

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: "boeotia fulica Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Yungas Bolivia//TYPE//Type//Syntype" [examined]

Adelpha boeotia Fldr., Kirby (1871); *Adelpha boeotia davisi* Butl., Fruhstorfer (1915) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from *A. b. fidicula* and *A. b. oberthurii* by the DFW postdiscal band being entirely orange and of approximately equal width in cells 2A-Cu$_2$ to Cu$_1$-M$_3$. There is extensive intergradation to *A. b. oberthurii* in eastern Central America, which I discuss under that taxon, since specimens there may be difficult to assign to subspecies. The size of the orange DFW subapical spots is very variable, they may be large and almost fill the cell or reduced to small dots. One male in the BMNH from Bogotá has some orange in the DFW discal cell between the second and fourth cell bars, and a trace of orange scaling distal of the white DHW postdiscal band in cells Cu$_1$-M$_1$. There is some variation in the colour of the ventral surface, which may have a paler, more orange-brown ground colour, particularly in west Andean specimens, and the differences can be quite marked between west and east Ecuadorian specimens. However, the ventral colour is paler in some east Andean specimens and appears to be continuously variable, and is therefore an unreliable character for subspecific recognition.

Felder & Felder (1867) described this species from an unspecified number of male specimens in their collection collected by Lindig and labelled Bogotá. They compared it with *A. malea aethalia* and *A. cocala cocala*, but stated that the VFW submarginal series were more parallel to the margin than in *A. cocala*. Fortunately, a syntype specimen is in the BMNH and allows certain identification of this taxon. Fruhstorfer (1915) described *A. boeotia fulica* based on an unspecified number of specimens from Bolivia, and stated that the ventral surface was a more intense reddish brown. Comparison of a syntype in the BMNH with the syntype of *A. boeotia* shows this to not be the case, and as I can find no consistent differences between any east Andean populations, I synonymise *fulica* with *boeotia* (**syn. nov.**).

Range: This subspecies is known from extreme eastern Panama to western Ecuador, and on the eastern slopes of the Andes from Venezuela to Bolivia. It is also found in southwestern Brazil, and there are a handful of records from the Guianas, requiring confirmation. The species was not listed from French Guiana by Brévignon & Brévignon (1997).

Habitat and adult ecology: This subspecies is generally uncommon throughout its range, although judging from a series of 104 males in the BMNH labelled "Bogotá", it can be locally abundant. It is typically found in lower montane rain forest habitats, but also occurs in lowland forest near mountains and in the lowlands of southwestern Brazil. In Ecuador, it occurs from 450-1200m in the east Andean foothills, while in the west it has been recorded from 700-1700m. I have found single males to be attracted to traps baited with rotting fish in forest light gaps, always along streams or rivers. The female is much rarer than the male and I have never observed it in the field. It is interesting to note that this species, and *A. delinita*, are two of the few *Adelpha* with an orange DFW band and white DHW band not to have developed an extra orange DHW band in populations of the eastern foothills of the Cordillera de Mérida, in Venezuela, possibly because they generally fly at higher elevations than typical members of this mimicry complex.

Specimens examined (362♂, 5♀): † - with orange DFW discal cell bar.

PANAMA (11♂): *Darién*: Caña 4-700m Aug. 11♂ USNM. **VENEZUELA** (16♂): *Amazonas*: San Juan de Manapiare 300m Dec. 1♂ MUSM; *Aragua*:

Cumbre de Chosen Oct. 1♂ FSCA; Portochuelo 1100m Dec. 1♂ MUSM; Rancho Grande Jan. 1100m 3♂ USNM; *Distrito Federal*: Caracas 3000' Sep. Oct. 1♂ AME, 1♂ BMB; *Mérida*: Mérida 1♂ BMNH; Mucuchachi 1♂ BMB; *Sucre*: Quebrada Seca, Cumaná Jan. 1♂ BMNH; *Zulia*: El Tucuco 420m May 1♂ MUSM; *Not located*: Palo Alto Río Tigre Oct. 1♂ USNM-error?; no specific locality 1♂ BMNH, 1♂ MCZ, 1♂ USNM. **COLOMBIA** (199♂, 2♀): *Antioquia*: Antioquia 1♂ ZMHU; Medellín 3♂ BMB; *Boyacá*: Muzo Jun. Jul. 2♂ AME, 3♂ BMB; Otanche 1♂ JFL; head Río Carare 2-5000' 2♂ USNM; *Caldas*: Manizales 2♂ BMNH; *Cundinamarca*: Bogotá 104♂ BMNH, 2♂ BMB, 2♂ MCZ, 1♂ USNM, 1♂ AMNH; *El César*: Manaure 1♂ BMNH; *Magdalena*: Onaca, Santa Marta Jul.-Aug. 1♂ BMNH; *Meta*: Villavicencio Feb. 9♂ AMNH, 1♂ AME, 1♂ USNM; *Risaralda*: Dist. de Pereira 1♂, 1♀ BMNH; *Santander*: La Borroscosa Dec. 1♂ AMNH; La Lechera Nov. 2♂ AMNH; La Soledad Dec. 1♂ AMNH; *Tolima*: El Santuário 1♂ BMNH; Río Atá 800-1000m May 2♂ AME; *Valle de Cauca*: Cali 1000m Oct. 1♂ MUSM; Corinto 5♂ BMNH; Jiménez 1000' Jun. 3♂ BMNH; Juntas 4♂ BMNH, 1♂ ZMHU; Pichinde 2000m Jan. 1♂ LMC; Río Aguacatal 2000m 1♂ BMB; Río Dagua 5♂ BMNH, 1♂ ZMHU; no specific locality 3♂ ZMHU; *Not located*: Bogotá-Buenaventura Dec.-Feb. 6♂ BMNH; Caucathal 1♂ ZMHU; Cauca Valley 1♂ BMNH; Magdalena Vall. May-Aug. 1♂ BMNH, 1♂ BMB; San Felipe 1♂ BMNH; W. Colombia 2000' Jul. 2♂ BMB; no specific locality 11♂ AMNH, 2♂ USNM, 1♂, 1♀ BMNH, 1♂ BMB, 1♂ MCZ. **ECUADOR**: (30♂): *Carchi*: Santa Rosa, Río Golondrinas 1700m Nov. 1♂ KWJH; *Esmeraldas*: Río Piguambí km 5 Lita-San Lorenzo rd. 800m Jul. 1♂ KWJH; *Imbabura*: Paramba 3500' Mar. 4♂ BMNH; *Morona-Santiago*: Macas 1♂ AMNH; 2°-4°S, 78°W 875m Nov. Dec. 3♂ AMNH; *Napo*: Hollín 600m 1♂ AMNH; Latas Aug. 1♂ MUSM; Misahuallí Jul. 1♂ KWJH; Pimpilala 600m Sep. 1♂ KWJH; *Pastaza*: Hda. Moravia 1200m Feb. 1♂ KWJH; *Pichincha*: Reserva Maquipucuna 1300m Aug. 1♂ KWJH; Río Toachi 1200m May 1♂ AME; *Tungurahua*: La Mascota 1200m Aug. 1♂ AME; *Zamora-Chinchipe*: Palanda 1♂ BMNH; Quebrada Chorillos 1250m Nov. 1♂ KWJH; Río Numbala 1♂ BMB; Zamora 1♂ BMNH; *Not located*: middle Ecuador 2♂ AMNH; Oriente 3♂ AMNH; Pacific slope 1♂ USNM-error; upper Río Napo Jan. 1♂ AMNH; no specific locality 1♂ MNHN. **PERU** (75♂): *Amazonas*: Chachapoyas 2♂ BMNH; Falso Paquisha 800m Oct. 1♂ MUSM; *Cajamarca*: Charape 4000' Sep. Oct. 2♂ BMNH; Jaén, 5 km W., Nov. 800m 1♂ MUSM; *Cuzco*: Caradoc Feb. 1♂ BMNH; Cosñipata Vall. 1♂ BMNH; Marcapata 1♂ MCZ; Pampaconas Aug. 1♂ USNM; Vilcanota 3000m 1♂ ZMHU; *Huánuco*: Tingo María Mar. May-Sep. 2♂ FSCA, 5♂ AME; *Junín*: Chanchamayo 7♂ BMNH, 4♂ ZMHU, 2♂ USNM, 1♂ BMB; La Merced 6♂ BMB; San Luis de Shuaro Aug. 1♂ MUSM; *Loreto*: Pebas 1♂ ZMHU; *Madre de Dios*: Albergue Amazonia, Río Madre de Dios 600m Oct. 1♂ MUSM; Pakitza 340m Sep. 1♂ MUSM; Puerto Maldonado, 30 km S.W., Oct. 1♂ USNM; Río de Las Piedras Oct. 1♂ MUSM; *Pasco*: Oxapampa 2♂ MUSM; Pozuzo 2♂ BMNH, 1♂ BMB; *Puno*: Chaquimayo 25-3000' Apr.-Aug. 2♂ BMNH; La Oroya-Agualani Oct. 1♂ BMNH; *San Martín*: Huayabamba 3500' 2♂ BMNH; Jepelacio 1100m May 6♂ AMNH, 1♂ AME; *Not located*: Río Huallaga 3♂ AMNH; no specific locality 9♂ BMNH, 1♂ BMB, 1♂ USNM. **BOLIVIA** (16♂, 1♀): *Cochabamba*: 5 days N. Cochabamba Aug. 1♂ BMNH; *El Beni*: Cachuela Esperanza Sep. 1♂ AME; *La Paz*: Coroico 2000m Mar. 4♂ AMNH, 1♂ ZMHU; Río Songo 2♂ ZMHU; Río Suapi 1000m 1♂ ZMHU; Yungas 1♂ BMNH; *Santa Cruz*: Buenavista Feb. 1♂ AME; Juntas 1♀ ZMHU; Prov. Sara Feb.-May 2♂ BMNH; *Not located*: no specific locality 1♂ BMNH, 1♂ BMB. **BRAZIL** (5♂, 1♀): *Amazonas*: lower Rio Madeira Jul.-Sep. 2♂(1†trace), 1♀ BMNH; *Rondônia*: Cacaulândia Oct. 1♂ USNM; *Not located*: no specific locality 2♂ AMNH. **GUYANA** (1♂): *Potaro/Siparuni*: Potaro River 1♂ AME. **FRENCH GUIANA** (1♂, 1♀): *Cayenne*: Cayenne 1♀ BMNH; *Not located*: no specific locality 1♂† BMNH. **COUNTRY UNKNOWN** (13♂): Bolivia? 1♂ BMNH; no specific locality 6♂ MCZ, 1♂ AME, 3♂ BMB, 1♂ MNHN, 1♂ USNM.

Additional locality data: **ECUADOR**: *Napo*: Cerro Lumbaquí Norte 950m Aug. (Willmott & Hall, sight records).

Adelpha boeotia oberthurii (Boisduval, 1870)

Figs. **82c,d**; 173a,b; *302*

Heterochroa oberthurii Boisduval (1870: 46)

TL: Guatemala. **Types**: **BMNH**(T): **ST**♂: “Heterochroa oberthurii Bdv. Guatemala//Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3//Godman vidit Janv. 1883//Typicum Specimen//Type//Syntype”; **BMNH**(M): **ST**♂: “Ex Musaeo Dris. Boisduval//Ex Oberthür Brit. Mus. 1927-3//Paratype” [both examined]

=*Adelpha jacquelinae* Steinhauser & Miller (1977: 5, figs. 10-14) **syn. nov.**

TL: Chimalapa, Oaxaca, Mexico. **Types** (all Mexico): **AME**: **HT**♂: Chimalapa Oaxaca T. Escalante VIII-65; 2**PT**♂: Chimalapa Aug. Sep.; **PT**♀: Puerto Eligio Oct. = *A. erymanthis esperanza*; **PT**♂: Petalocingo Jun.; 4**PT**♂: San Quintín Aug.-Oct.; **PT**♂: Ocozingo, Chiapas Jul. [all examined]; **PT**♂: Chimalapa Sep.; **PT**♂: Río Sarabia, Oaxaca Sep. [not examined]

Adelpha oberthurii Boisd., Kirby (1871); *Adelpha boeotia oberthurii* Boisd., Fruhstorfer (1915); *Limenitis (Adelpha) oberthurii* Boisd., Ross (1976) (probably *A. milleri*); *Adelpha* ? *jacquelinae* Stein. & Mill., D’Abrera (1987); =*Adelpha boeotia boeotia* Fldr., DeVries (1987); *Adelpha boeotia oberthurii* Boisd., Lamas & Small (1992)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the thinner DFW postdiscal band, which is narrower and whitish in cell 2A-Cu_2, by the more brownish ground colour of the VHW, the more closely spaced postdiscal series (the inner postdiscal series is typically closer to or equally near the outer postdiscal series than to the postdiscal band, whereas in *A. b. boeotia* it is nearer the postdiscal band) and by the silvery grey VHW inner submarginal series being basally displaced in cell M_3-M_2. On the VFW, the red-brown vertical line cuts the pale postdiscal band nearer its distal margin, particularly in cell Cu_2-Cu_1, whereas in *A. b. boeotia* this line is nearer the centre of the postdiscal band. From Panama to Guatemala the DFW postdiscal band thins and the white extends further anteriorly, reaching vein Cu_1; specimens from Costa Rica have a blend of white and orange in DFW cell 2A-Cu_2, while Panamanian specimens often have this cell entirely orange. The majority of distinguishing characters thus appear to vary clinally, and there is intergradation throughout Panama, but I recognise two subspecies for the present, with reservations, since there appear to be a couple of additional characters supporting their retention. *Adelpha b. fidicula* is distinguished as discussed under that taxon.

Boisduval (1870) described *A. b. oberthurii* based on an unspecified number of specimens from Guatemala, and there are two syntype specimens in the BMNH. Godman & Salvin (1884) figured the taxon and expressed doubts over whether it differed from *A. thesprotia*, but Fruhstorfer (1915) correctly placed it as a subspecies of *A. boeotia*, since it shares all of the diagnostic ventral wing pattern characters of that taxon. Steinhauser & Miller (1977) described a series of Mexican specimens as a new species, *A. jacquelinae*, principally based on a misidentification of the orange form of *A. phylaca phylaca* as *A. boeotia oberthurii*, which they figured under that name (figs. 15, 16). The characters separating *A. boeotia* from *A. phylaca* are discussed in the species account above. The holotype and all of the male paratypes of *jacquelinae* do not differ consistently from typical *A. boeotia oberthurii*, and I therefore synonymise *jacquelinae* with *oberthurii* (**syn. nov.**). However, the single female paratype is actually a specimen of a subspecies of *A. erymanthis* (see discussion under *A. erymanthis*), which differs from *A. boeotia* as detailed under the species account above.

Range: Central Mexico to western Panama, with intergradation to the nominate subspecies in Panama.

Immature stages: Unknown; although DeVries (1986, 1987) reported hostplant and early stage information for this taxon, these apply to *A. phylaca pseudaethalia*, as discussed under the latter taxon.

Habitat and adult ecology: This subspecies is known from near sea level to 1300m throughout its range, typically in relatively undisturbed premontane rain forest, where it appears to be uncommon. DeVries (1987) reports that it is typically encountered as solitary individuals during the dry season along forest edges and in light gaps, but these comments may also apply to *A. phylaca pseudaethalia* (see under that taxon). Jason Hall and myself (Hall & Willmott, 1993) recorded a single male in a canopy trap baited with rotting fish near San Vito, in Costa Rica, during the middle of the wet season.

Specimens examined (63♂, 7♀):

MEXICO (13♂): *Chiapas*: Musté Sep. 1♂ AMNH; Ocozingo Jul. 1♂ AME; Petalocingo Jun. 1♂ AME; San Quintín Aug.-Oct. 4♂ AME; no specific locality 1♂ AMNH; *Oaxaca*: Chimalapa Aug. Sep. 3♂ AME; Soyolapan el Bajo Oct. 1♂ AMNH; *Veracruz*: Misantla 1♂ USNM. **GUATEMALA** (10♂, 1♀): *Alta Verapaz*: Polochic Valley 3♂ BMNH; *Escuintla*: Palín 1♂ USNM; Zapote 2♂ BMNH; *Suchitepéquez*: Panan 1♂ BMNH; *Not located*: no specific locality Jul. Aug. 1♂ BMNH, 1♂, 1♀ ZMHU, 1♂ BMB. **HONDURAS** (10♂): *Cortés*: San Pedro Sula 4♂ BMNH; *Not located*: no specific locality 1♂ BMNH, 3♂ ZMHU, 1♂ BMB, 1♂ USNM. **COSTA RICA** (7♂, 3♀): *Cartago*: Irazú 6-7000' 1♂ BMNH; Juan Viñas Jun. 1♀ USNM; *Puntarenas*: San Vito 1100m Aug. Sep. 2♂ USNM, 1♂ KWJH; *Not located*: no specific locality Sep. Oct. 1♀ BMNH, 1♀ ZMHU, 2♂ BMB, 1♂ MNHN. **PANAMA** (18♂, 2♀): *Chiriquí*: Bugaba 800-1500' 4♂ BMNH; Chiriquí 1275m Feb. 1♂ USNM, 2♂ BMNH, 3♂ ZMHU, 1♂ BMB; Santa Clara 1200m Aug. Sep. 4♂ USNM; Volcán Chiriquí 4000' Apr.-Jul. 1♂ AMNH; Potrerillos 3600' Mar. Dec. 2♀ USNM; *Veraguas*: Veraguas 1♂ BMNH; *Not located*: no specific locality 1♂ BMNH. "**BRAZIL**" (1♂): *Santa Catharina*: no specific locality 1♂ MCZ-error. **COUNTRY UNKNOWN** (7♂, 1♀): "probably Mexico" 1♂ USNM; no specific locality 2♂ USNM, 1♀ ZMHU, 4♂ MCZ(may be *A. b. fidicula*).

Additional locality data: **MEXICO**: *Chiapas*: Chajul (de la Maza & de la Maza, 1985); Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona (de la Maza & de la Maza, 1993).

Adelpha boeotia fidicula Fruhstorfer, 1915

Figs. **82e,f**; *302*

Adelpha boeotia fidicula Fruhstorfer (1915: 517)

TL: Espírito Santo [Brazil]. **Types**: **BMNH**(T): **HT**♀: "boeotia fidicula Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Espírito Santo Brasil ex coll. Fruhstorfer//sp. leop.//TYPE//Type//Holotype" [examined]

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the postdiscal band on the DFW being white in cell 2A-Cu$_2$ and half the width of the remainder of the band. The ground colour of the VHW is a more uniform, reddish instead of purplish brown, and this may prove to be a stable character.

Fruhstorfer (1915) described this subspecies based on a single specimen in his collection from Espírito Santo, and the holotype is in the BMNH (Fig. 82e,f). He compared it to Honduran specimens, stating that it differed by having a broader orange band on the DFW and a more reddish ground colour of the VHW. While it is possible that this specimen is mislabelled, for a number of reasons I do not believe this to be the case. Central American specimens with the DFW postdiscal band white in cell 2A-Cu$_2$ are typical of more westerly localities, and such specimens have the orange area of the DFW postdiscal band much narrower than in the holotype of *fidicula*. Such specimens also have the red-brown line on the VFW cutting the pale postdiscal band near the distal edge of the band, whereas in the holotype of *fidicula* it is near the middle of the band, as in the nominate subspecies. The postdiscal bands in *A. b. oberthurii* are closely spaced and the ground colour between them is dark brown, whereas the syntype of *fidicula* has the series widely spaced with a reddish ground colour between, similar to the nominate subspecies. All of the distinctive characters of *fidicula* are typical of southeast Brazilian *Adelpha* (e.g. *Adelpha malea goyama*, *A. capucinus velia*), and any similarity to Central American specimens is probably due to convergent evolution of a similar mimetic dorsal colour pattern. In the BMNH(T) there is a putative male syntype of this taxon from San Pedro Sula in Honduras, mentioned by Hall (1938), but this is not a valid type specimen and was not mentioned in the original description as such, only in comparison with the Brazilian specimen.

Range: Only known from Espírito Santo, but presumably widespread throughout southeastern Brazil, in at least the states of Rio de Janeiro and São Paulo. The single specimen of *A. boeotia* in the MCZ from Santa Catharina is a mislabelled specimen of *A. b. oberthurii*.

Habitat and adult ecology: Nothing is known about the biology of this very rare subspecies. I have seen only a single *bona fide* specimen in collections.

Specimens examined (1♀):

BRAZIL (1♀): *Espírito Santo*: no specific locality 1♀ BMNH.

Adelpha amazona Austin & Jasinski, 1999

Figs. **83a,b**; 174a,b; 254a,b; *302*

Adelpha amazona Austin & Jasinski (1999: 113, figs. 1-6)

TL: about 5 km NE Cacaulândia, Linha C-20, 7 km E. B65, 62 km S. Ariquemes, Rondônia, Brazil. **Types**: **UFP**: **HT**♂: Fazenda Rancho Grande, 62 km S. Ariquemes, 6 Nov. 1991 [original photograph examined]; **UFP**, **NSM**, **AJ**: 41**PT**♂: same locality as HT; Linha 10, 5 km S. Cacaulândia, Brazil; Tingo María, Huánuco, Peru [not examined – full type data in Austin & Jasinski (1999)]

Identification, taxonomy and variation:

This species is similar in wing pattern to a number of sympatric Amazonian species, especially *A. pollina* and *A. viola*, and to *A. boeotia*, which is sympatric only in southwestern Brazil. *Adelpha amazona* is distinguished from all species by the inner postdiscal series on the VFW being isolated from the postdiscal band in cells Cu$_2$-Cu$_1$, Cu$_1$-M$_3$ and M$_3$-M$_2$, but fused in cell 2A-Cu$_2$. Also distinctive is the increase in the spacing of the inner and outer postdiscal series from the costa to the anal margin, and between the inner postdiscal series and the postdiscal band from cell Cu$_2$-Cu$_1$ to the costa. *Adelpha pollina* is further distinguished by having the postdiscal series fused in cell Rs-Sc+R$_1$ on the VHW, while *A. viola* has a distinct third discal cell bar on the VFW.

Austin & Jasinski (1999) described this species based on a long series of specimens from the type locality, and clearly figured the male genitalia and both wing surfaces of the holotype in colour. There is therefore no doubt as to the identity of the species, but its relationships to other *Adelpha* are obscure. The undivided postdiscal series on the VFW, which are separated from the inner postdiscal band, the reddish VHW ground colour, the even, faint postdiscal series and the rounded clunicula in the male genitalia suggest a possible close relationship with *A. boeotia*, but the male genitalic valvae are rather elongate and the spines at the distal tip of the valvae extend slightly ventrally, contrary to *A. boeotia* and relatives. It appears to have no very close relatives.

Range: This species has been recorded from scattered localities throughout the Amazon basin, in Peru and Brazil, and the Guianas. It is certainly more widespread, probably occurring in eastern Ecuador, southeastern Colombia, southern Venezuela and Bolivia.

Habitat and adult ecology: This rare species has been recorded from around 200-900m, but although there are very few specimens in collections, it may be locally not uncommon. Austin & Jasinski (1999) report it to be largely confined to primary forest at the type locality, where it may be readily attracted to traps baited with rotting fruit or fish. Adults are most abundant from October to November, the early wet season. I have examined only two female specimens and there are no observations of it in nature.

Specimens examined: 13 (11♂, 2♀)

PERU (4♂): *Loreto*: Pebas 2♂ ZMHU; *Madre de Dios*: Río Tambopata 270m 25/8/92 1♂ MUSM; Tambopata 19/6/85 1♂ FSCA. **BRAZIL** (7♂): *Amazonas*: São Paulo de Olivença 3♂ ZMHU; *Rondônia*: Cacaulândia Nov. 3♂ AME; Rancho Grande, nr. Cacaulândia 200m 1♂ KWJH. **GUYANA** (2♀): *Cuyuni/Mazaruni*: Mt. Ayanganna 900m Apr. 1♀ coll. S. Fratello; *Not located*: Essequibo R., Brit. Guiana. 140 mi. inland 1♀ BMNH.

Additional locality data: **BRAZIL**: *Pará*: Pará (Forbes, MS).

Adelpha ximena (C. & R. Felder, 1862)

Figs. **84**; 175; 255; *302*

Identification, taxonomy and variation:

This species is distinguished from similar species by having the upper postdiscal band on the forewing positioned very close to the postcellular bar, so that there is no silvery grey scaling distal of the bar in cells M_2-M_1 and M_1-R_5, by the postdiscal series on the VFW being fused throughout and separated from the postdiscal band by an indistinctly marked red-brown line, and by the distal edge of the orange DFW band being vertical and noticeably scalloped. The postdiscal series on the VHW are very widely separated in cells M_3-M_2, M_2-M_1 and M_1-Rs. The male genitalia are similar in shape to members of the *A. phylaca* group, with a very pronounced dorsal medial lobe, but have a high, pointed clunicula more typical of the *A. capucinus* group, while differing from both of these groups in the spines at the posterior tip of the valve being almost or entirely absent. There is variation in the presence or absence of a white DHW postdiscal band, and in its thickness, and two subspecies are recognised.

The systematic relationships of this species are uncertain, the male genitalia are distinctly different from all other superficially similar species while the wing pattern offers few clues. Unfortunately the genitalia of the only female specimen to which I have had access, the holotype of *mossi*, almost completely disintegrated on dissection, but the corpus bursae clearly has sclerotised bands placing the species outside the *A. cocala* group. It otherwise appears to be a fairly isolated species.

Range and status: East of the Andes from southern Venezuela to Bolivia, throughout the Brazilian Amazon and the Guianas. Uncommon to very rare in primary lowland rain forest from sea level to 1200m.

Specimens examined: 92 (89♂, 3♀)

Adelpha ximena ximena (C. & R. Felder, 1862)

Figs. **84a,b**; 175a,b; *302*

Heterochroa ximena C. & R. Felder (1862: 116)

TL: ["fluminis Negro superioris in Brasilia septentrionali"]-erroneous. **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//Río Negro Type//ximena n.//ximena Felder//Illustrated in The Butterflies of Venezuela A. Neild, 1996//7" [examined]

Adelpha ximena Fldr., Kirby (1871)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. x. mossi* by the white DHW postdiscal band being absent on the DHW, and on the DFW in cell 2A-Cu_2 and the posterior half of cell Cu_2-Cu_1, in addition to the postdiscal series on the VHW being visible only as slightly paler lines in the ground colour, rather than marked with silvery grey scaling, and the ventral ground colour being more reddish than purplish brown. There is little variation. I have examined no female specimens, but according to Neild (1996) they are similar to males.

Felder & Felder (1862) described this distinctive species based on an unspecified number of male specimens collected supposedly on the banks of the Upper Río Negro in Brazil, although the specimens actually originated in the Río Huallaga valley in Peru (Lamas, 1976). The description refers to the noticeably sinuate distal margin of the orange DFW band, and a syntype is in the BMNH.

Range: I have examined specimens of the nominate subspecies from southeastern Colombia to Bolivia, while Neild (1996) also reports its presence at the base of the eastern slope of the southern Cordillera de Mérida in Venezuela.

Habitat and adult ecology: This subspecies is rare throughout the northern part of its range, but apparently not uncommon from central Peru to Bolivia. It occurs in primary lowland forest up to 1200m in the foothills of the eastern Andes. In eastern Ecuador, myself and Jason Hall have found males to be attracted to rotting fish in forest light gaps on ridge and hill tops. I have seen no specimens of the female, which is clearly extremely rare. The lack of a white DHW postdiscal band is almost certainly due to mimicry with a number of *Adelpha* which only occur at the base of the eastern Andes, including *A. boreas*, *A. zina irma*, *A. irmina* and *A. salmoneus*.

Specimens examined (81♂):

COLOMBIA (2♂): *Putumayo*: Mocoa Sep. 1♂ ESM; Río Afan 600m Aug. 1♂ LMC. **ECUADOR** (4♂): *Napo*: Chichicorrumi 450m Jul. 1♂ KWJH; Pimpilala Oct. 1♂ MJP; El Capricho 800m Oct. 1♂ KWJH; *Not located*: no specific locality 1♂ BMNH. **PERU** (49♂): *Cuzco*: Buenos Aires, 20-28 km E., 12-1500m Dec. 1♂ MUSM; *Huánuco*: Acomayo 2♂ BMB; Cord. del Sira 800m Aug. Sep. 1♂ MUSM; Tingo María May Jul. 3♂ AME; *Junín*: Chanchamayo 3♂ BMNH, 1♂ ZMHU, 1♂ AME, 3♂ BMB; La Merced 2500' 7♂ BMNH, 2♂ BMB; Perené 2000' 1♂ BMB, 1♂ MNHN; San Ramón 1♂ MUSM; Satipo 750m May-Jul. 2♂ AME, 1♂ MUSM; *Loreto*: "Río Negro" [=Río Huallaga] 1♂ BMNH; *Pasco*: Pozuzo 1♂ BMNH, 1♂ MUSM; *Puno*: Oroya 3000' Apr. 1♂ BMNH; San Gaban 2500' Mar.-Apr. 1♂ BMNH; *San Martín*: Huayabamba 1♂ ZMHU; Moyobamba Sep. 1♂ BMNH; Rioja 1♂ ZMHU; *Ucayali*: Boquerón Abad Mar. Dec. 1♂ AME, 1♂ MUSM; *Not located*: no specific locality Feb. 7♂ BMNH, 2♂ USNM, 1♂ BMB. **BOLIVIA** (22♂): *Cochabamba*: Cochabamba 1♂ BMNH; 5 days N. Cochabamba 1♂ MCZ; *La Paz*: Bellavista 1♂ BMNH; Caranavi 1200m Feb. 2♂ MUSM; Muachay Aug. 1♂ BMNH; Río Songo Feb-May 1♂ BMNH, 2♂ ZMHU; Río Songo-Río Suapi 1100m Mar.-Jun. 1♂ BMNH; Yungas 2♂ BMNH; *Potosí*: Tupiza 6♂ ZMHU-error?; *Not located*: no specific locality Mar. 1♂ BMNH, 1♂ MCZ, 2♂ JFL. **COUNTRY UNKNOWN** (4♂): Up. Amazons 1♂ BMNH; no specific locality 1♂ BMNH, 1♂ USNM, 1♂ BMB.

Additional locality data: **ECUADOR**: *Napo*: Apuya Jul. (Willmott & Hall, sight records).

Adelpha ximena mossi Hall, 1933

Figs. **84c,d**; 175c; 255a,b; *302*

Adelpha mossi Hall (1933: 11, pl. 1, fig. 20)

TL: Pará, Brazil. **Types**: **BMNH**(M): **HT**♀: "Miles Moss Coll. B.M. 1947-453//Adelpha mossi Type. Hall Nov. Zool. 1933//Pará A.M. Moss//Type// Holotype" [examined]

=*Adelpha ximena willmotti* Neild (1996: 31, pl. 1, fig. 9, 10) **syn. nov.**

TL: Yavita, Alto Río Atabapo, oeste de Amazonas, Venezuela. **Types**: **MNHN**: **HT**♂: Yavita 100m Sep. [photograph examined]

Adelpha ximena mossi Hall, Neild (1996)

Identification, taxonomy and variation:

This taxon was described by Hall (1933) as a species based on a single female collected by Reverend Miles Moss at Pará. The ventral surface of the taxon is, however, identical in all important respects to *A. ximena ximena*, in particular in having, on the forewing, the upper postdiscal band positioned very close to the postcellular bar, so that there is no silvery grey scaling distal of the bar in cells M_2-M_1 and M_1-R_5, the postdiscal series fused throughout and separated from the postdiscal band by an indistinctly marked red-brown line, and the distal edge of the orange band on the DFW noticeably scalloped. The male genitalia are also the same, and distinctive in having a very pronounced dorsal medial lobe, a high, pointed clunicula and the spines at the posterior tip almost or entirely absent. Finally, there exist specimens, such as the holotype of *willmotti*, that are clearly phenotypically intermediate between *ximena mossi* and *ximena ximena*.

This subspecies was identified by Fruhstorfer (1915) as *A. barnesia*, based on a single male specimen in the BMNH from

Bolivia, while the same specimen also bears a label written by W.T.M. Forbes, presumably while he was working on his unpublished manuscript of *Adelpha*, which reads "Can this be male of *Adelpha erymanthis* ??? W.T.M.F.". D'Abrera (1987) figured the same specimen as *A.* ? *barnesia*. Neild (1996) correctly placed *mossi* as a subspecies of *ximena*, and went on to describe a further subspecies, *willmotti*, from a single specimen in the MNHN collected by Lichy at Yavita, in southern Venezuela. His original description compares the specimen with the nominate subspecies, but in fact it is more similar to *A. x. mossi*, and differs from typical male specimens in having the white postdiscal band reduced to half its width on the DHW, being particularly constricted in cells Cu$_1$-M$_3$ and M$_1$-Rs, and only represented on the DFW as small white spot in cell 2A-Cu$_2$. I believe, however, that this specimen does not represent a geographically stable phenotype, but instead represents variation in *A. x. mossi*. The region whence the specimen originated is not known to contain any other endemic *Adelpha* subspecies, and since *Adelpha* dorsal wing patterns almost always converge on a common regional phenotype, there is little explanation for a reduced hindwing band in an area where all other similar *Adelpha* are otherwise typical. Furthermore, I have examined a photograph of male specimen from Mato Grosso in Brazil, kindly sent to me by Eurides Furtado, in which the hindwing band is reduced even more than in the holotype of *willmotti*, showing that this phenotype also occurs in other areas. One possible explanation might be that narrower white bands are seasonally induced in specimens from drier regions where there is mixed savannah and forest. I conclude that there is little evidence, at present, to regard the reduced white DHW band in the holotype of *willmotti* as a stable character, and therefore synonymise the name with *mossi* (**syn. nov.**).

Range: This subspecies is very rare in collections, but the known locality data indicate that it is probably widespread throughout the entire Amazon basin, with the exception of the Andean foothills. Brévignon & Brévignon (1997) figure a female specimen from French Guiana, and I have examined a photograph of two female specimens in the PB collected on the Río Demerara in Guyana.

Habitat and adult ecology: This subspecies is very rare, and presumably restricted to primary lowland rainforest.

Specimens examined (8♂, 3♀):

VENEZUELA (1♂): *Amazonas*: Yavita, Río Atabapo 100m Sep. 1♂ MNHN. **PERU** (3♂): *Loreto*: Iquitos 2♂ ZMHU; *Not located*: Río Huallaga 1♂ USNM. **BOLIVIA** (1♂): no specific locality 1♂ BMNH. **BRAZIL** (3♂, 1♀): *Amazonas*: São Paulo de Olivença 2♂ ZMHU; *Mato Grosso*: no specific locality (probably Diamantino area) 1♂ EF; *Pará*: Pará 1♀ BMNH. **GUYANA** (2♀): Demerara river 2♀ PB(photograph).

Adelpha delinita Fruhstorfer, 1913

Figs. **85**; 176; *303*

Identification, taxonomy and variation:

This species is distinguished from all others by having the inner postdiscal series on the VHW most pronounced in cell M$_3$-M$_2$, where it appears as a white spot even when the rest of the series is reduced, and by having the dark red-brown band immediately distal to the inner postdiscal series being noticeably thicker in cell M$_2$-M$_1$. The inner and outer postdiscal series on the VFW in cell Cu$_2$-Cu$_1$ are fused to form a single, large pale spot, further distinguishing the species from *A. fabricia*, *A. capucinus*, *A. malea*, *A. heraclea* and *A. pollina*, while the postdiscal series on the VFW extend into cell 2A-Cu$_2$ as a pale dash or spot, separated from the postdiscal band by dark brown, which further distinguishes the species from *A. erymanthis*, *A. phylaca*, *A. messana*, *A. erotia* and *A. thesprotia*. The orange-brown distal and white basal colours on the ventral surface are also distinctive, these areas being purplish brown and purplish grey respectively in *A. sichaeus* and *A. hesterbergi*. While some specimens of *A. delinita* may have a red-brown line cutting through the pale VFW postdiscal area, this line is distinctly curving and diagonal rather than straight and vertical as in *A. boeotia*. There is variation in the width of the DFW postdiscal band and the extent to which it is constricted in cells Cu$_1$-M$_3$ and 2A-Cu$_2$, and the band in cell 2A-Cu$_2$ may be orange or white. The ventral ground colour varies from orange-brown to a deeper red-brown, and a red-brown line may or may not be visible cutting entirely through the pale VFW postdiscal area. Two weakly defined subspecies are recognised.

The male genitalia of this species are distinctive, with the valvae having a pronounced ventral medial lobe but almost absent dorsal medial lobe, while the posterior tip is very broad and the clunicula is short and blunt. The genitalia are possibly most similar to those of species such as *A. boeotia* and *A. malea*, but the relatively long saccus and the fused postdiscal series in cell Cu$_2$-Cu$_1$ of the VFW suggest a relationship with the *A. phylaca* group. *Adelpha delinita* lacks the closely bunched, randomly spaced pale scales at the base of veins M$_2$-Rs that all members of the *A. phylaca* group possess, and I have been unable to examine the female genitalia since only a single female specimen is known. The early stages are also unknown, and therefore the systematic placement of this species remains rather conjectural.

Range and status: Mexico to western Ecuador, Venezuela to Bolivia. Uncommon to locally abundant in mountain foothills from sea level up to 1300m.

Specimens examined: 429 (428♂, 1♀)

Adelpha delinita delinita Fruhstorfer, 1913

Figs. **85a,b**; 176a,b; *303*

Adelpha delinita Fruhstorfer (1913: pl. 106f; 1915: 519)

TL: [Cauca Valley, Colombia]. **Types**: **BMNH**(M): **ST**?♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//86//Adelpha erotia delinita Fruhstorfer det. R.I. Vane-Wright 1983 ? Holotype//Fruhstorfer Coll. B.M. 1933-131//Colombia//Columbien ex coll. H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(R): **ST**♂: "Onaca Sta. Marta E. VI.-B VIII (Chas.-Engelke)//erotia delinita Fruhst.//106 f.1//delinita//R" [both examined]

=*Adelpha delinita albina* Hall (1938: 232) **syn. nov.**

TL: Marcapata, Peru. **OTL**: Amazonas-part of Peru. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//erotia fa. albina Fruhst.//Peru H. Fruhstorfer//Marcapata//TYPE//Type//Syntype" [examined]

=*Adelpha erotia erotia* form *albina* Fruhstorfer (1915: 519) unavailable name

TL: Marcapata, Peru. **OTL**: Amazonas-part of Peru. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//erotia fa. albina Fruhst.//Peru H. Fruhstorfer//Marcapata//TYPE//Type//Syntype" [examined]

Adelpha erotia delinita Fruhst., Fruhstorfer (1915); *Adelpha erotia erotia* Hew., Fruhstorfer (1915) in part, misid.; *Adelpha delinita delinita* Fruhst., Hall (1938); *Heterochroa erotia delinita* Fruhst., Hoffmann (1940); *Adelpha delinita* Fruhst., D'Abrera (1987)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. d. utina* by the paler, more orange-brown ventral ground colour, the heavier pale postdiscal and submarginal markings on the ventral surface, and the broader DFW postdiscal band. Compared to specimens from more southerly localities, Colombian specimens typically have DFW postdiscal bands of more even width, while some also have very slight orange scaling at the distal edge of the white DHW postdiscal band. The latter character represents individual variation, and also occurs in occasional Venezuelan specimens. The orange DFW subapical spots vary slightly in size throughout the range, and very occasional Peruvian specimens have the DFW postdiscal band in cell 2A-Cu_2 narrower and entirely white.

Fruhstorfer (1913) figured both surfaces of a new taxon, *delinita*, which he subsequently placed as a subspecies of *A. erotia* (Fruhstorfer, 1915: 519). He stated (Fruhstorfer, 1915) that the type was from the Cauca valley in Colombia, that the ventral surface was dark reddish brown with reduced submarginal bands, and that occasional specimens had orange scaling at the distal edge of the white DHW postdiscal band. One male in the BMNH from Onaca, in Colombia, does have slight orange scaling distal of the white DHW band, while another from the same locality bears a label "106 f.1", indicating it to be the specimen on which the original dorsal surface figure was based. The original ventral surface figure very closely matches the specimen in the BMNH(T), which is probably Fruhstorfer's intended holotype, despite the fact that it lacks any "Cauca Valley" label. A further male in the BMNH from Colombia also bears a type label and the name "erotia fa. tyrea", a manuscript name published by Martín *et al.* ([1923]) as a *nomen nudum*. The name *albina* was described as a form of *A. erotia erotia* with white at the DFW anal margin, based on males from the "Amazonas-part of Peru" (Fruhstorfer, 1915), and an apparent type specimen is in the BMNH(T). Although *albina* Fruhstorfer is a quadrinomial and therefore unavailable, Hall (1938) made it an available name through bibliographic reference to Fruhstorfer's original description (ICZN, 1999: Art. 13.1.2, 45.5.1; see discussion of the names *fugela* Fruhstorfer and *fugela* Hall, under *A. heraclea heraclea*). The original type series of *albina* Fruhstorfer becomes the type series of *albina* Hall (ICZN, 1999: Art. 72.4.4); since Fruhstorfer (1915) placed taxa of at least four distinct species under *A. erotia*, and there is thus the possibility that his type series includes several taxa, a lectotype designation is necessary. I designate the specimen in the BMNH(T), with the following label data, as the lectotype of *Adelpha erotia erotia* form *albina* Fruhstorfer, and therefore also *Adelpha delinita albina* Hall: "Fruhstorfer Coll. B.M. 1937-285//erotia fa. albina Fruhst.//Peru H. Fruhstorfer //Marcapata//TYPE//Type//Syntype". This specimen represents a form that is sympatric with typical *A. delinita delinita*, and I therefore synonymise *albina* Hall with *delinita* (**syn. nov.**).

Although Fruhstorfer (1915) originally described this taxon as a subspecies of *erotia*, Hall (1938) correctly realised that it was distinct and raised it to specific rank, a move repeated unnecessarily by D'Abrera (1987).

Range: The nominate subspecies is known on the western slopes of the Andes from Venezuela to southern Ecuador, and to Bolivia on the eastern slopes. The single record from São Paulo de Olivença in Brazil is almost certainly a mislabelling, since the species is unknown from heavily collected lowland areas in eastern Peru, such as Pebas and Iquitos.

Habitat and adult ecology: This subspecies is restricted to lowland to premontane rain forest from 400-1300m in the foothills of the Andes, apparently never occurring far from the mountains. While it is evidently locally abundant, judging from a series of 123 males in the BMNH labelled "Bogotá", I have found the species to be uncommon in eastern Ecuador, usually encountered as solitary males attracted to traps baited with rotting fish along forest trails, most often in the vicinity of streams or rivers. The female is exceptionally rare and I have seen only a single specimen in collections.

Specimens examined (398♂, 1♀):
"**MEXICO**" (2♂): no specific locality 2♂ MCZ-error. "**PANAMA**" (1♂): *Chiriquí*: Chiriquí 1♂ MCZ-error. **VENEZUELA** (6♂, 1♀): *Aragua*: Guamito Sep. 1♂ FSCA; Portochuelo 1100m Jul. 1♂ MUSM; *Lara*: La Escalera Yacambú 1000m Sep. 1♂ AFEN; *Táchira*: Hda. Pánaga 800m T. Pyrcz Nov. 1♀ JFL, 2♂ AFEN; La Parada 1200m Aug. 1♂ AFEN. **COLOMBIA** (232♂): *Antioquia*: Crystallina 1100' Jun. Jul. 1♂ BMB; Medellín 1♂ BMB; Puerto Berrío May-Aug. 2♂ BMB; *Boyacá*: Muzo Jun. Jul. 2♂ BMNH, 5♂ AME, 8♂ BMB, 1♂ AMNH; Otanche Feb. Apr. 2♂ JFL; head Río Carare 1♂ USNM; *Caldas*: Manizales 3♂ BMNH; Río Guacaica 1300m Aug. 1♂ KWJH; *Cundinamarca*: Bogotá 123♂ BMNH, 6♂ BMB, 4♂ USNM, 1♂ MCZ, 1♂ MNHN; El Baldio Aug. Sep. 1♂ BMB; Fusagasugá 1♂ AMNH; *El César*: Manaure 3♂ BMNH; *Magdalena*: Onaca, Santa Marta 2200' Jun.-Oct. 5♂ BMNH; *Meta*: Peperital-Buenavista Jan. 1♂ BMB; Río Negro Nov. 1♂ ESM; Villavicencio 11♂ AMNH; *Norte de Santander*: Cúcuta 1♂ AMNH; *Santander*: Carare 1♂ BMNH; *Tolima*: Río Chili Apr.-Jun. 1♂ BMB; *Valle del Cauca*: Río Dagua 2♂ ZMHU; *Not located*: Bogotá-Buenaventura Dec.-Feb. 1♂ BMNH; Caucathal 2♂ ZMHU; Interior of Colombia 1♂ BMNH; Magdalena Vall. May-Aug. 2♂ BMB; no specific locality 18♂ AMNH, 7♂ BMNH, 6♂ USNM, 3♂ ZMHU, 2♂ BMB. **ECUADOR** (31♂): *El Oro*: Pasaje 500m 1♂ AME; *Imbabura*: Paramba 3500' Mar. May '97 dry season (Rosenberg) 2♂ BMNH; *Napo*: Las Minas de Misahuallí 450m May Jul. 1♂ KWJH, 1♂ AME; Río Napo 2♂ MNHN; *Pastaza*: Puyo Dec. 1♂ AMNH; Puyo-Tena rd., km 25, Jun. Aug. 1♂ KWJH, 1♂ USNM; Shell 1050m Feb. 1♂ KWJH; *Tungurahua*: La Mascota 1200m Aug. 1♂ AME; *Zamora-Chinchipe*: Zamora 2♂ BMNH; *Not located*: middle Ecuador 2♂ AMNH; Oriente 3♂ AMNH; no specific locality 2♂ BMNH, 3♂ BMB, 4♂ MNHN, 2♂ USNM, 1♂ AMNH. **PERU** (85♂): *Amazonas*: Chachapoyas 1♂ BMNH; *Ayacucho*: Río Piene 3♂ AMNH; *Cuzco*: Callanga 1500m 1♂ ZMHU; Caradoc 4000' Feb. 1♂ BMNH; Chirimayo 1000' Jul. 1♂ BMNH; Marcapata 4500' 3♂ BMNH, 1♂ MCZ; Quincemil Nov. 1♂ MUSM; *Huánuco*: Huánuco 1400m 1♂ USNM; Tingo María Feb. Mar. May Jul.-Sep. 1♂ FSCA, 10♂ AME, 2♂ MUSM; *Junín*: Chanchamayo 17♂ BMNH, 2♂ ZMHU, 2♂ AME, 3♂ BMB, 1♂ USNM; El Porvenir 900m Apr. 1♂ BMNH; La Merced 3♂ BMNH, 4♂ BMB; Río Ipoki May 1♂ MUSM; *Pasco*: Huancabamba 1♂ BMNH; Pozuzo 800-1000m 6♂ BMNH, 1♂ MUSM, 1♂ BMB; *Puno*: La Oroya 3100' Jan. Nov. Dec. 3♂ BMNH; Sto. Domingo 4500' Jan. 2♂ BMNH; *San Martín*: Huayabamba 3500' 1♂ BMNH, 1♂ ZMHU; Jepelacio 2♂ AMNH; *Not located*: Huallaga 1♂ AMNH; no specific locality 3♂ BMNH, 2♂ BMB, 1♂ MUSM. **BOLIVIA** (24♂): *Cochabamba*: 5 days N. Cochabamba Aug. Sep. 1♂ BMNH, 1♂ BMB; Yungas del Espírito Santo 3♂ BMNH; *La Paz*: Caranavi 1200m Feb. 1♂ MUSM; Coroico May 1♂ BMNH, 2♂ ZMHU, 1♂ AME; 20 mi. above Mapiri 4000' 1♂ BMNH; Río Heath 1♂ MNHN; Río Songo 1200m 3♂ ZMHU; *Santa Cruz*: Bueyes 2♂ BMNH, 1♂ ZMHU; Juntas 1000m 1♂ ZMHU; Prov. Sara Feb. Mar. 1♂ BMNH; *Not located*: no specific locality Apr. 6♂ BMNH, 1♂ AME. "**BRAZIL**" (1♂): *Amazonas*: São Paulo de Olivença 1♂ ZMHU-error. **COUNTRY UNKNOWN** (16♂): Amazonas 1♂ MCZ; U. Amazon 1♂ BMB; no specific locality 7♂ MCZ, 3♂ AME, 1♂ BMB, 3♂ MNHN.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Miriumi Oct.; *Napo*: Apuya Sep. Oct. Dec.; Cerro Lumbaquí Norte 950m Aug.; Tena-Loreto rd., km 49, 1300m Mar.; *Zamora-Chinchipe*: Río Bombuscara May (Willmott & Hall, sight records).

Adelpha delinita utina Hall, 1938

Figs. **85c,d**; 176c; *303*

Adelpha delinita utina Hall (1938: 233)

TL: Honduras. **Types**: **BMNH**(M): **ST**♂: "Syntype ♂ Adelpha delinita utina Hall G. Lamas det. 1987//Honduras, S.P. Sula, ex coll. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1937-285//Syntype"; **ST**♂: "Honduras, S.P. Sula, ex coll. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1937-285//Syntype" [both examined] NB - these also PLT of *uta* Fruhstorfer and *uta* Hall (= *A. pollina*)

=*Adelpha escalantei* Steinhauser & Miller (1977: 5, figs. 7-9) **syn. nov.**

TL: Chimalapa, Oaxaca, Mexico. **Types**: **AME**: **HT**♂: Chimalapa Oaxaca T. Escalante IX-65; **PT**♂: Comitán Sep.; **PT**♂: Ocozingo Aug. [all examined]; **PT**♂: Comitán Mar. [not examined]

Adelpha delinita uta Frust., DeVries (1987); *Adelpha escalantei* Stein. & Mill., de la Maza (1987), de la Maza & de la Maza (1993)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that taxon. There is some intergradation in Panama and Costa Rica, where specimens typically have narrower DFW bands than the nominate subspecies and some white at the anal margin of the DFW, but both of these characters are not so pronounced as in specimens from more westerly localities. Specimens from central and eastern Panama may show the subspecies to be not worthy of retention.

Hall (1938) described *utina* based on two of the three syntypes of *A. erotia erotia* form *uta* described by Fruhstorfer

(1915). The first named syntype of *uta*, designated here as the lectotype of *uta* Fruhstorfer and *uta* Hall, is actually a specimen of *A. pollina*, while the remaining two are *A. delinita* (Fig. 85c,d). Steinhauser & Miller (1977) appeared to be unaware of Hall's (1938) description, since they made no mention of *A. delinita utina* when they described *A. escalantei* from specimens from Chiapas, in the AME. The type specimens of *escalantei* differ from those of *A. d. utina* only in having a narrower orange DFW band, but as variation in this subspecies is clinal throughout central America, with the DFW band narrowing from east to west, these specimens merely represent the end of the cline, and I therefore synonymise *escalantei* with *utina* (**syn. nov.**).

Range: Mexico to western Panama.

Habitat and adult ecology: This subspecies is uncommon to rare throughout its range. In Mexico, it has been reported from tropical evergreen lowland forest and premontane forest from 100-1000m, where it flies from May to September (de la Maza, 1987; de la Maza & de la Maza, 1993). DeVries (1987) reports the species to occur from sea level to 700m on the Atlantic slope in Costa Rica, as uncommon solitary individuals along forest edges. A single record in the USNM from San Vito indicates that it probably occurs throughout the Pacific slope also.

Specimens examined (30♂):
MEXICO (4♂): *Chiapas*: Comitán Sep. 1♂ AME; Ocozingo Aug. 1♂ AME; no specific locality 1♂ AMNH; *Oaxaca*: Chimalapa Sep. 1♂ AME. **GUATEMALA** (1♂): *Alta Verapaz*: Baléu Sep. 1♂ AMNH. **HONDURAS** (2♂): *Cortés*: San Pedro Sula 2♂ BMNH. **COSTA RICA** (13♂): *Cartago*: Cachí 1♂ BMNH; Juan Viñas Jan. 1500' 1♂ BMB, 1♂ USNM; Moravia de Chirripo 1♂ USNM; *Limón*: Guápiles May 1♂ BMNH; *Puntarenas*: San Vito 1♂ USNM; *Not located*: no specific locality 5♂ BMNH, 1♂ ZMHU, 1♂ USNM. **PANAMA** (10♂): *Chiriquí*: Chiriquí 2♂ BMNH, 6♂ ZMHU; Santa Clara 2♂ USNM.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva (de la Maza & de la Maza, 1993); Chajul; Mapastepec; Santa Rosa; *Oaxaca*: La Esperanza; Metates (de la Maza, 1987).

Adelpha pollina Fruhstorfer, 1915

Figs. **86a,b**; 177a,b; 256a-c; *303*

Adelpha aethalia pollina Fruhstorfer (1915: 518)

TL: Cayenne [French Guiana]. **Types**: **BMNH**(T): **LT**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//85//Fruhstorfer Coll. B.M. 1933-131//aethalia pollina Fr.//Guyane Française La Forestière Haut Maroni Coll. Le Moult//TYPE//Type//Syntype" [examined]

=*Adelpha delinita uta* Hall (1938: 232) **syn. nov.**

TL: Bolivia. **OTL**: Bolivia; Honduras. **Types**: **BMNH**(T): **LT**♂: "uta Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Bolivien Fruhstorfer//TYPE//Type//Holotype"; **BMNH**(M): **PLT**♂: "Syntype ♂ Adelpha delinita utina Hall G. Lamas det. 1987//Honduras, S.P. Sula, ex coll. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1937-285//Syntype" = *delinita utina*; **PLT**♂: "Honduras, S.P. Sula, ex coll. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1937-285//Syntype" = *delinita utina* [all examined] NB – both PLT are also ST of *utina*.

=*Adelpha erotia erotia* form *uta* Fruhstorfer (1915: 519) unavailable name

TL: Bolivia. **OTL**: Bolivia; Honduras. **Types**: **BMNH**(T): **LT**♂: "uta Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Bolivien Fruhstorfer//TYPE//Type//Holotype"; **BMNH**(M): **PLT**♂: "Syntype ♂ Adelpha delinita utina Hall G. Lamas det. 1987//Honduras, S.P. Sula, ex coll. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1937-285//Syntype" = *delinita utina*; **PLT**♂: "Honduras, S.P. Sula, ex coll. Fruhstorfer//Paratype//Fruhstorfer Coll. B.M. 1937-285//Syntype" = *delinita utina* [all examined] NB – both PLT are also ST of *utina*.

Adelpha phylaca pollina Fruhst., Hall (1938); *Adelpha pollina* Fruhst., D'Abrera (1987); *Adelpha uta* Fruhst., D'Abrera (1987)

Identification, taxonomy and variation:

This species is distinguished from all similar species by having the inner and outer postdiscal series on the VHW fused to form an anteriorly pointing, V-shaped marking in cell Rs-$Sc+R_1$. The vein joining $Sc+R_1$ to the base of veins M_2-Rs is densely covered with pale greyish scales arranged randomly, rather than in lines as the scales are arranged over the remainder of the wing, and this character is shared only with *A. naxia* and members of the *A. phylaca* group, although it may apply to males only. *Adelpha pollina* can be additionally distinguished from all of those species by having a solid, red-brown line cutting through the pale postdiscal area on the VFW, separating the postdiscal series and the postdiscal band, while the postdiscal series are not fused to form a single pale spot in cell Cu_2-Cu_1, but are visible as two distinct dashes. The male genitalia of *A. pollina* are distinctive, the valvae do not have a pronounced ventral medial lobe and lack spines at the posterior tip, while the clunicula is high and pointed. The latter two characters are unique within the *A. phylaca* group. There is some variation in the size of the orange DFW subapical spots and the expression of the ventral postdiscal and submarginal series, which in some specimens may be almost entirely absent on the hindwing, with the exception of the inner submarginal series and the markings in cell Rs-$Sc+R_1$.

Fruhstorfer (1915) described *pollina* as a subspecies of "*A. aethalia*", based on an unspecified number of specimens collected by Le Moult in Cayenne. One page later, he described *uta* as a form of *A. erotia erotia* based on a male from Bolivia collected by Bang-Haas and two males from Honduras, both in his collection. Although the name *uta* was proposed as a quadrinomial, it was made available by Hall (1938) through bibliographic reference to Fruhstorfer's original description (ICZN, 1999: Art. 13.1.2, 45.5.1; see also discussion of the names *fugela* Fruhstorfer and *fugela* Hall, under *A. heraclea heraclea*). A syntype female of *pollina* is in the BMNH and closely matches the original description, but since Fruhstorfer did not recognise any of the distinguishing characters of this species and therefore may have also based his description on specimens of other taxa, I designate this syntype, with the following data, as the lectotype of *Adelpha aethalia pollina*: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//85//Fruhstorfer Coll. B.M. 1933-131//aethalia pollina Fr.//Guyane Française La Forestière Haut Maroni Coll. Le Moult//TYPE//Type//Syntype". The Bolivian syntype of *uta* Fruhstorfer (and therefore also *uta* Hall – ICZN, 1999: Art. 72.4.4) in the BMNH also represents this species, but the two syntypes from Honduras are *A. delinita* and are the specimens on which Hall (1938) based his description of *A. delinita utina*. Although DeVries (1987) used the name *uta* for Costa Rican *A. delinita*, the Bolivian specimen was the first named in the original description, and Hall (1938), explicitly, if unofficially, deemed the Bolivian specimen to be that on which the name *uta* Fruhstorfer (and therefore his own new name *uta*) should be based. I therefore designate the Bolivian specimen, with the following data, as the lectotype of *Adelpha erotia erotia* form *uta* Fruhstorfer and *Adelpha delinita uta* Hall: "uta Fruhst.//Fruhstorfer Coll. B.M. 1937-285 // Bolivien Fruhstorfer//TYPE//Type//Holotype". The lectotype differs from typical males of this species only in having a slightly darker ventral surface, and since this merely represents individual variation I synonymise *uta* Hall with *pollina* (**syn. nov.**).

This is another species that was unrecognised by Fruhstorfer as distinct, while Hall (1938) was also puzzled as to its status, placing *uta* Fruhstorfer as a subspecies of *A. delinita* (and unwittingly introducing is as a new name), but, rather uncertainly, combining *pollina* with *A. phylaca*.

Although D'Abrera (1987) correctly regarded *A. pollina* as a distinct species, he seems to have been unaware of its true diagnostic characters, since he also treated *uta* as a distinct species. Neild (1996) also regarded *A. pollina* as a distinct species, and for the first time correctly applied the name to male specimens; Hall (1938) mentions a male specimen in the BMNH from French Guiana with an orange DFW discal cell bar, but this is actually *A. boeotia boeotia*. The distinctive, pale, bunched scales on the DHW at the base of vein Rs suggests that the species is related to the *A. phylaca* group, but its wing pattern, male and female genitalia are otherwise atypical for that group. It has several VFW characters that typically occur in more primitive species, such as the isolation of the inner postdiscal series from the postdiscal band and the separation of the postdiscal series in cell Cu$_2$-Cu$_1$ on the VFW, but it is unclear whether these represent plesiomorphic character states or character state reversals.

Range: Southern and eastern Venezuela to Bolivia, Amazonian Brazil and the Guianas.

Habitat and adult ecology: This species is rare in collections from throughout its range, but in eastern Ecuador I have found it to be widespread in lowland rain forest, ranging from primary to heavily disturbed with much old secondary growth. During the wet season and early dry season males can be locally abundant in traps baited with rotting fish in large forest light gaps, particularly along ridge tops. I have never seen the female in nature and it is clearly very rare. The species has been recorded from sea level to 1000m.

Specimens examined: 48 (44♂, 4♀)

VENEZUELA (1♂): *Amazonas*: Mt. Duida Dec. 1♂ AMNH. **ECUADOR** (16♂): *Morona-Santiago*: Bomboiza Jul. Nov. 4♂ KWJH, 2♂ DAT; Méndez Oct. 1♂ MJP; Méndez-Santiago rd., km 40, Oct. 1♂ MJP; 2°-4°S, 78°W 875m Nov. Dec. 3♂ AMNH; *Napo*: Chichicorrumi Jul. 1♂ KWJH; Finca San Carlo Sep. 1♂ KWJH; Santa Rosa Oct. 1♂ MJP; *Tungurahua*: Río Negro Nov. 1♂ AME; *Not located*: middle Ecuador 1♂ AMNH. **PERU** (11♂): *Huánuco*: Tingo María Jun. 1♂ AME; *Junín*: Chanchamayo 2♂ BMB; La Merced 1♂ BMB; Satipo May Oct. 3♂ AME, 1♂ AMNH; *Madre de Dios*: Pakitza 340m Oct. 1♂ MUSM; *San Martín*: Jepelacio 1♂ AMNH; *Not located*: Río Huallaga 1♂ AMNH. **BOLIVIA** (4♂, 1♀): *Cochabamba*: 5 days N. Cochabamba Aug. 1♂, 1♀ MCZ; *La Paz*: Caranavi 1200m Feb. 1♂ MUSM; *Not located*: no specific locality 1♂ BMNH, 1♂ MCZ. **BRAZIL** (8♂, 2♀): *Amazonas*: Ega 1♂, 1♀ BMNH; Manaus, 80 km N., Sep. 1♀ MUSM; São Paulo de Olivença 2♂ ZMHU, 1♂ AME; Tefé Oct. 2♂ BMNH, 1♂ USNM; *Pará*: Óbidos 1♂ BMNH. **FRENCH GUIANA** (1♂, 1♀): *Laurent du Maroni*: Maroni River 1♂ AME; Haut Maroni 1♀ BMNH. **COUNTRY UNKNOWN** (3♂): Amaz. 1♂ USNM; U. Amazon 1♂ BMB; no specific locality 1♂ AMNH.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Méndez-Santiago rd., km 40, Nov.; *Napo*: Apuya Oct. Dec.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Sep.; El Capricho 850m Oct.; Yarina Jul.; *Pastaza*: Pitirishca 1000m Jul.; Puyo-Canelos rd., km 30, Oct. (Willmott & Hall, sight records).

Adelpha erotia (Hewitson, 1847)

Figs. **87**; 178; 257; *304*

Identification, taxonomy and variation:

Adelpha erotia is distinguished from all similar species by the configuration of the inner postdiscal series on the VHW, which is always well marked throughout and consists of separate white spots of varying shape, which increase gradually in width from the tornus to cell M$_2$-M$_1$ or M$_1$-Rs, then decrease gradually in width to the costa. *Adelpha thesprotia* and *A. phylaca* also differ in having both postdiscal series only marked by faint, indistinct silvery grey dashes, or visible only as a paler line in the ground colour, while the former additionally lacks the orange-brown VHW ground colour. *Adelpha erotia* may be distinguished from other similar species outside the *A. phylaca* group by having the postdiscal series in cell Cu$_2$-Cu$_1$ on the VFW fused to form a single, large pale spot (two dashes are visible in *A. fabricia*, *A. capucinus*, *A. malea*, *A. heraclea* and *A. pollina*), while the large, pale postdiscal spot in cell Cu$_1$-M$_3$ on the VFW is not divided by a dark brown line. Additional characters distinguishing *A. delinita* and *A. boeotia* are given under those species. There are two forms of this species throughout most of its range, one which has the DFW band entirely orange, and another in which the band is white to vein Cu$_1$, with the orange subapical marking isolated. In some individuals of the latter, the upper postdiscal band may be isolated from the postdiscal series on the DFW and almost completely white. There is variation in the width of the postdiscal band and consequent spacing of the postdiscal and submarginal VHW series, and two subspecies are recognised.

This is one of the oldest named species of "orange and white banded" *Adelpha*, and has consequently been misidentified more than most. The name *erotia* has been applied to *A. phylaca pseudaethalia* (Godman & Salvin, 1884), and to *A. heraclea*, *A. delinita* and *A. pollina*, in addition to true *A. erotia*, by Fruhstorfer (1915), in addition to many misidentifications of specimens in collections. The wing pattern, genitalia and early stages place *A. erotia* in the *A. phylaca* group, among which the male genitalia are unique in having a long, thin tip to the valvae which curves ventrally. The species with the most similar wing pattern and genitalia are *A. phylaca* and *A. messana*, both of which have extensive orange-brown ventral coloration and thin, pointed tips to the male genitalic valvae, and these are probably the closest relatives of *A. erotia*.

Range and status: Mexico to western Ecuador, Venezuela to Bolivia, Brazil and the Guianas. Common to uncommon in lowland rain forest from sea level up to 1400m.

Specimens examined: 464 (436♂, 28♀)

Adelpha erotia erotia (Hewitson, 1847)

Figs. **87a-d**; 178a-d; 257a-c; *304*

Heterochroa erotia Hewitson (1847: 259, pl. XX, fig. 3)

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: "Bolivia//Heterochroa erotia Hewitson ♂ Lectotype det. R.I. Vane-Wright 1983 - see Hall, 1938: 232//B.M. TYPE No. Rh. 9830 Heterochroa erotia ♀ Hew.//Type//Lectotype" [examined]

=*Heterochroa lerna* Hewitson (1847: 259, pl. XX, fig. 4) **stat. rest.**

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//110//lerna Hewitson ? var. of erotia//B.M. TYPE No. Rh. 9831 Heterochroa lerna ♂ Hew.//Bolivia//Type//Syntype" [examined]

=*Heterochroa aeolia* C. & R. Felder (1867: 419) **stat. rest.**

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//Bogotá Lindig Type//Aeolia n.//Felder Colln." [examined]

=*Adelpha permagna* Fruhstorfer (1913: pl. 106e; 1915: 519) **stat. rest.**

TL: [Río Dagua, Colombia; French Guiana; Marcapata, Peru]. **Types**: **BMNH**(M): **ST**♂: "Río Dagua, Colombia W. Rosenberg//erotia permagna Fruhst.//Fruhstorfer Coll. B.M. 1937-285"; **BMNH**(R): **ST**♂: "erotia permagna Fruhst.//R. Dagua Colombia W. Rosenberg//R"; **ST**♂: "erotia permagna Fruhst.//R. Dagua Colombia W. Rosenberg//TYPE//Syntype"; **BMNH**(T): **ST**♀: "Guyane Française, St. Laurent du Maroni, coll. Le Moult//Octubre//Fruhstorfer Coll. B.M. 1937-285//TYPE//Type"; **ST**?♂: "Syntype ♂ Adelpha erotia permagna Fruhstorfer G. Lamas det. 1987//Tarap.//Peru H. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//TYPE//Type//Syntype" [all examined]

=*Adelpha leonina* Fruhstorfer (1913: pl. 107b; 1915: 525)

TL: [Essequibo River, British Guiana (Guyana)]. **Types**: **BMNH**(R): **ST**♀: "Type//Syntype//Essequibo R., Brit. Guiana, 140 mi. inland//leonina//107 B1//lerna leonina Fruhst." [examined]

=*Adelpha archidona* Fruhstorfer (1913: pl. 107b; 1915: 525)

TL: ["Amazon-district of Ecuador and Peru"]. **Types**: **BMNH**(T): **ST**♂: "lerna archidona Fruhst.//Ecuador Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype"; **BMNH**(M): **ST**?♂: "Coca Upp. R.

Napo V.-VII. 1899 W. Goodfellow//Fruhstorfer Coll. B.M. 1937-285"; **BMNH**(R): **ST**♂: "Syntype//Type//R//Archidona, W. Ecuador, April 1899 (W. Goodfellow)//107 C2//archidona//lerna archidona" [all examined]

Adelpha erotia Hew., Kirby (1871); *Adelpha aeolia* Fldr., Kirby (1871); *Adelpha lerna* Hew., Kirby (1871); *Limenitis (Adelpha) erotia* Hew., Ross (1976) (not this species, probably *A. phylaca pseudaethalia*); *Adelpha erotia deleta* Fruhst., Neild (1996) in part, misid.

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. e. caphira* under that subspecies. *Adelpha erotia erotia* exists in two forms; a form represented by the type of the name *erotia*, in which the postdiscal band is predominantly orange extends unbroken to the costa (Fig. 87a,b), and a form represented by the type of the name *lerna* (Fig. 87c,d), in which the orange postdiscal marking in cell Cu_1-M_3 and the upper postdiscal band are isolated from the postdiscal band in cells 2A-Cu_2 and Cu_2-Cu_1, in which cells the band is completely white. In the form "erotia", the DFW postdiscal band may have variable amounts of white along the anal margin and in cell 2A-Cu_2, and the width of the band varies so that it may or may not fill the base of cell Cu_1-M_3. The orange DFW subapical spot in cell M_2-M_1 may be joined by a thin orange line to the upper postdiscal band in that cell, and the DHW may have a thin orange line at the distal edge of the white postdiscal band in cells M_1-Rs and Rs-Sc+R_1. In form "lerna", the orange on the DFW may or may not extend into cell Cu_2-Cu_1, and the width of the hindwing band varies slightly, with all specimens from western Ecuador having noticeably thinner bands, particularly on the DFW. However, the latter differences are too slight and variable to warrant subspecific recognition. The single specimen known to date from southeastern Brazil is of the form "lerna", and except for a slightly narrower white DFW postdiscal band, it is phenotypically almost identical to typical Amazonian specimens. The ventral surface of both forms varies in the amount of orange-brown shading around the pale markings.

Hewitson (1847) described *erotia* based on an unspecified number of specimens in the British Museum from Bolivia, and the figure of the dorsal surface and description closely match the syntype specimen in the BMNH. Immediately after, he described *lerna*, also based on a specimen or specimens in the British Museum from Bolivia, and stated: "very nearly allied to the last-described species (*H. Erotia*), of which it may possibly be only a remarkable variety.". Again, the original figure closely matches the BMNH syntype (Fig. 87c,d). Hewitson showed great perception in realising the importance of the ventral surface markings of these two phenotypes, and Fruhstorfer (1915), who placed them in two completely different species groups, would have benefited significantly from giving more credit to Hewitson's original insight. Although Fruhstorfer (1915: 524) claimed that the genitalia of *lerna* and *erotia* differed, this was probably based on misidentification of *A. delinita* as *A. erotia*, since Fruhstorfer (1909b) figured the genitalia of the former under the name "*A. erotia*". Hall (1938) acted on Hewitson's suspicions and regarded *lerna* as the "dimorphic and much commoner form of *erotia*", but due to a lack of intermediate forms in collections, subsequent authors, with the exception of D'Abrera (1987), were reluctant to follow Hall and typically treated the two phenotypes as distinct species (DeVries, 1987; Lamas & Small, 1992; Neild, 1996). DeVries (1987) stated that the two phenotypes occurred in Costa Rica in different habitats, *erotia* from 700-1500m, and *lerna* from sea level to 800m. However, I have found no evidence that this is the case in Ecuador, or through examination of specimen data labels throughout the range. The ventral wing pattern and male genitalia of the two phenotypes do not differ, the only difference between them being the extent of orange on the DFW. Since a homologous dimorphism occurs in a number of related species, either within or between populations, such as *A. phylaca*, *A. messana* and *A. mesentina* (see discussion under that species), I do not regard it as a specific character. Finally, the broader white hindwing postdiscal band in the syntype of *deleta*, and consequently closer VHW postdiscal and submarginal series, closely parallel the wing pattern of sympatric "lerna" forms of *A. e. caphira*. Since other sympatric *erotia*-like *Adelpha* do not have broader hindwing bands, this suggests the two forms are conspecific. I therefore place *lerna* once more as a synonym of *erotia* (**stat. rest.**).

Felder & Felder (1867) described *aeolia* based on an unspecified number of male specimens in their collection, collected by Lindig in Bogotá, comparing the dorsal surface to *lerna* and *A. messana* and the ventral surface to *A. erotia*. A syntype male in the BMNH shows this to be a "lerna" form of *A. erotia*; the name was synonymised with *erotia* by Hall (1938), but inexplicably resurrected by DeVries (1987) for a subspecies from "Nicaragua to Panama". Specimens from this part of the range do not differ from typical *erotia* and I therefore place *aeolia* once more in synonymy with *erotia* (**stat. rest.**). Fruhstorfer (1913) figured the dorsal surface of a specimen under the name *permagna*, which he stated (Fruhstorfer, 1915: 519) was a subspecies or form of *A. erotia*, based on males from Río Dagua (Colombia), Marcapata (Peru) and a female from French Guiana. The main criteria for its recognition seemed to be larger size and more extensive ventral submarginal white markings, precisely the characters that separate this species from *A. delinita*, which Fruhstorfer (1913: pl. 106e) figured under the name *erotia*. There are a number of syntypes in the BMNH, of which only two specimens from Río Dagua differ in any way from the typical "erotia" form of *A. erotia*. These specimens have a thin orange line connecting the subapical spot to the upper postdiscal band in cell M_2-M_1 on the DFW, and slight orange scaling at the DHW costa along the distal edge of the white postdiscal band. However, this appears to be a form that occurs sympatrically with typical specimens on the western slopes of the Cordillera Occidental and in the Cauca Valley in Colombia. Hall (1938) synonymised the name with *erotia*, while Lamas & Small (1992) applied it to Panamanian specimens, but for the same reasons as discussed under *aeolia*, I regard it as a synonym of *erotia* (**stat. rest.**). Fruhstorfer (1913) went on to figure two new taxa, *leonina* and *archidona*, which he later described as subspecies of *A. lerna* (Fruhstorfer, 1915: 525). Both are "lerna" forms, the unique syntype of *leonina* being a female from Essequibo River, while there are several syntypes of *archidona* in the BMNH from eastern Ecuador. The syntype of *leonina* appears to be slightly aberrant, with narrow white bands and a darkened ventral surface, and may be indicating some intergradation to *A. erotia caphira*. The syntypes of *archidona* show no differences from typical "lerna" forms of *A. erotia*, and Hall (1938) correctly synonymised both *leonina* and *archidona* with *A. erotia*. Finally it must be mentioned that the names faebina, tyrea and improvida, listed by Martín *et al.* ([1923]) as subspecies of *A. erotia*, are *nomina nuda*.

Range: This subspecies is known from Mexico to western Ecuador, and from Venezuela to Bolivia, throughout Brazil and the Guianas. I have seen only a single South American specimen outside of the Amazonian region, recently collected by Thomas Emmel in Santa Catharina, implying its presence throughout most of southeastern Brazil. I have seen no specimens of the form "erotia" from Mexico to Costa Rica, but it is reported from the latter country by DeVries (1987). The records for form "erotia" from Chontales (Nicaragua) and Polochic Valley (Guatemala) in Godman & Salvin (1884) are misidentifications of *A. phylaca pseudaethalia*, at least for the latter locality; I have seen no specimens of either *A. erotia erotia* form "erotia" or *A. phylaca pseudaethalia* from Chontales. The record of Davis (1928) for "*lerna*" from Belize is plausible but unlikely given the absence or obvious rarity of this species in that country (it is as yet unreported), and probably represents a misidentification of *A. phylaca phylaca*, as Meerman (1999) speculates, or perhaps more likely, *A. barnesia leucas* or *A. malea fundania*.

Immature stages: Phil DeVries (pers. comm.) apparently reared the form "lerna" in Costa Rica on *Stigmaphyllon* sp. (Malphigiaceae), with this being the first record for this species group on this plant family, but I have not seen any voucher specimens. Annette Aiello (pers. comm.) reports that she found a pupa of this species (form "lerna") in Panama with the typical pronounced dorsal projection on A2 characteristic of members of the *A. phylaca* group. I have examined a photograph of the voucher specimen.

Habitat and adult ecology: This species is common throughout most of its range and occurs in lowland rain forest from sea level to 1400m, though typically it is encountered below 1000m. Although males are infrequently seen on the wing, I have found them in eastern Ecuador to be readily attracted to traps baited with rotting fish in the subcanopy or in large light gaps in primary forest. The two forms occur in the same sites throughout the range, with the possible exception of western Central America where the "erotia" form seems to be absent, though the "lerna" form is always the most common of the two, outnumbering the "erotia" form by 3:1 in collections. The two forms are probably maintained in this species by mimicry with other *Adelpha* species; the width of the white postdiscal band tends to respond to the band width of species resembling the "lerna" form, such that specimens from western Ecuador have typically narrow bands. The possible monomorphism in western Central America may also be due to the higher proportion of *Adelpha* taxa there with the *A. iphiclus*-type of DFW pattern. Since the relative abundances of the two phenotypes and their distributions is of interest in terms of their probable mimetic importance, I have listed locality data for the two phenotypes separately below.

Specimens examined (422♂, 23♀):

Orange DFW form ("erotia") (108♂, 9♀): † - intergrade to form "lerna".

PANAMA (3♂): *Chiriquí*: Chiriquí 1♂ BMNH; *Darién*: Caña 1♂ USNM; *Not located*: Canal zone 1♂ USNM. **VENEZUELA** (1♂): *Bolívar*: Kanarakuni, Alto Río Caura Oct. 1♂ MUSM. **COLOMBIA** (25♂, 2♀): *Amazonas*: Florida Oct. 1♂ BMNH; *Caquetá*: no specific locality 1♂ KWJH; *Cauca*: Popayán 1♂ BMNH; *Cundinamarca*: Bogotá 3♂ BMNH, 1♂ MCZ; *Meta*: San José Guaviare 1♂, 1♀ JFL; *Putumayo*: Umbría 2♂ AMNH; *Risaralda*: Hda. Bacorí, Pblo. Rico Jan. 1♂† MHNUC; Santa Rita, Cauca R. 1♀ BMNH; Suaruga Dec. 1♂ AMNH; *Valle del Cauca*: Corinto Aug. 1♂ LMC; El Danubio, Río Anchicayá Aug. 1♂ LMC; Juntas 1♂ BMNH; Río Dagua 7♂ BMNH; *Not located*: Bogotá-Buenaventura 1♂ BMNH; Santa Catharina 1♂ MNHN; no specific locality 1♂ ZMHU. **ECUADOR** (28♂, 1♀): *Bolívar*: Balzapamba 1♂ BMNH; *Carchi*: Lita, ridge east of Río Baboso 950m Jul. 1♂ KWJH; *Esmeraldas*: El Durango 300m Jul. 1♂ KWJH; *Los Ríos*: Santa Ana María, Quevedo 1♂ BMNH; *Morona-Santiago*: Bomboiza 850m Jul. 2♂ KWJH; Macas 1♂ BMNH; Méndez-Santiago rd., km 40, 750m Nov. 1♂ KWJH; Sucúa 1♂ MNHN; *Napo*: Chichicorrumi 450m Jul. 1♂ KWJH; Napo Jul. 1♂ BMNH; Río Coca Jul. 4♂ AME; Talag Sep. 2♂ DAT; *Pastaza*: Mera Apr. 1♂ DAT; Sarayacu 1♂ BMNH; Zulaya Dec. 1♂ AMNH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Aug. Sep. 1♂, 1♀ PJD; *Tungurahua*: La Mascota 1200m Aug. 1♂ AME; *Not located*: E. Ecuador 1♂ USNM; Oriente 1♂ AMNH; no specific locality 1♂ BMNH, 2♂ MNHN, 1♂ JFL. **PERU** (39♂, 1♀): *Huánuco*: Tingo María Mar.-May Aug. Sep. 1♂ FSCA, 6♂ AME, 1♂ USNM; *Junín*: Chanchamayo 2♂ BMNH, 1♂ BMB; La Merced 2500' Sep. 2♂ BMNH; Perené Dist. 1♂ BMNH; Satipo Dec. 2♂ AME, 1♂ AMNH; *Loreto*: Castaña Oct. 150m 1♂ MUSM; Iquitos Mar. 1♂ BMNH, 1♂ AME, 1♂ AMNH; Río Sucusari 140m Sep. 1♂ MUSM; upper Río Tapiche Feb. 1♂ AMNH; *Madre de Dios*: Pakitza 400m Oct. 1♀ MUSM; *Pasco*: Eneñas, Alto Yurinaqui 1400m May 1♂ MUSM; Oxapampa 1♂ MUSM; *Puno*: Chaquimayo May-Aug. 1♂ BMB; *San Martín*: Jepelacio 1100m May 1♂ AME, 5♂ AMNH; Tarapoto 2♂ BMNH, 2♂ BMB; *Not located*: Río Huallaga 1♂ USNM, 1♂ AMNH; no specific locality 1♂ BMNH. **BOLIVIA** (1♂): no specific locality 1♂ BMNH. **BRAZIL** (5♂): *Amazonas*: Benjamin Constant Oct. 1♂ AMNH; São Paulo de Olivença 1♂ ZMHU; *Pará*: Óbidos 1♂ AMNH; *Rondônia*: Cacaulândia Nov. 2♂ FSCA. **GUYANA** (2♂): *Barima/Waini*: Mabaruma Dec. Jan. 1♂ BMB; *Not located*: Demerara 1♂ BMNH. **FRENCH GUIANA** (5♀): *Laurent du Maroni*: Maroni River 1♀ AME; St. Jean 1♀ USNM; St. Laurent du Maroni Oct. 1♀ BMNH; *Not located*: no specific locality 1♀ BMNH, 1♀ USNM. **COUNTRY UNKNOWN** (4♂): no specific locality 1♂ BMNH, 1♂ ZMHU, 2♂ MCZ.

White DFW form ("lerna") (314♂, 14♀):

NICARAGUA (1♂, 2♀): *Chontales*: Chontales 2♀ BMNH; *Not located*: no specific locality 1♂ BMNH. **COSTA RICA** (1♀): no specific locality 1♀ AMNH. **PANAMA** (27♂, 2♀): *Chiriquí*: Bugaba 800-1500' 4♂ BMNH, 1♂ MCZ; Chiriquí 2♂ BMNH, 2♂, 1♀ ZMHU, 4♂ BMB; Parida I. "Col." 17 to 19 Jan. '01 (J.H. Batty) 1♂ BMNH; *Darién*: Caña Jul. Aug. 8♂ USNM; *Panamá*: Cerro Jefe 900m Apr. 1♂ USNM; Cocolí Oct. 1♂ USNM; Las Cumbres Oct. 1♀ FSCA; *Veraguas*: Veraguas 1♂ BMNH; *Not located*: Los Ríos, Canal zone 1♂ USNM; no specific locality 1♂ BMNH. **COLOMBIA** (132♂, 3♀): *Amazonas*: Florida 2♂ BMNH; Leticia Jul. 1♂ AMNH, 1♂ ESM; Puerto Nariño Dec. 3♂ LMC; *Antioquia*: Casabe Oct. Nov. 2♂ AMNH, 1♂ AME; Crystallina 1100' Jun. Jul. 1♂ BMB; Medellín 1♂ AME; *Boyacá*: Muzo 1♂ AME; Otanche Apr. Jun. 3♂ JFL; head Río Carare 1♀ USNM; *Caldas*: Guamocó 1♂ AMNH; *Caquetá*: Río Bodoquero Jan. 1♂ USNM; *Cundinamarca*: Bogotá 45♂ BMNH, 2♂ BMB, 2♂ MCZ, 4♂ USNM, 1♂ MNHN; Veragua 1♂ MNHN; *El César*: Río Los Clavos 350-400m Aug. 2♂ BMNH; *Meta*: Villavicencio Feb. 1♀ AME; *Putumayo*: Mocoa 800m Sep. 1♂ MHNUC; Umbría 1♂ AMNH; *Santander*: El Centro 1♂ AMNH; *Tolima*: El Santuário 2♂ BMNH; *Valle del Cauca*: Río Dagua 1♂ ZMHU; Yatacué, Alto Anchicayá Aug. 1♂ LMC; *Not located*: Cauca 4♂ AMNH; Cauca valley 1♂ AMNH; no specific locality 38♂ AMNH, 6♂, 1♀ BMNH, 1♂ USNM. **ECUADOR** (28♂, 2♀): *Carchi*: Lita, ridge east of Río Baboso Jul. 900-1050m 2♂ KWJH; *Esmeraldas*: La Punta, km 44 Lita-San Lorenzo rd. 300m Jul. 1♂ KWJH; *Guayas*: Guayaquil 1♀ BMNH; *Los Ríos*: Santa Ana María, Quevedo 1♀ BMNH; *Manabí*: Palmar 200m Apr. 1♂ AMNH; *Morona-Santiago*: Bomboiza Jul. 3♂ KWJH; *Napo*: Archidona 1♂ BMNH; Chichicorrumi Oct. 2♂ MJP; Coca May-Jul. 1♂ BMNH; Finca San Carlo Oct. 1♂ DAT; Latas Nov. 1♂ MUSM; Pimpilala Oct. 1♂ MJP; Río Coca 300m Jun. 2♂ AME; Río Napo Sep. Oct. 1♂ BMNH, 2♂ MNHN; upper Napo May-Jul. 1♂ BMNH; *Pichincha*: Sto. Domingo May 1♂ BMNH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Feb. 1♂ PJD; *Tungurahua*: Mirador 1♂ MNHN; *Not located*: Oriente 1♂ AMNH; no specific locality 1♂ BMNH, 2♂ BMB, 1♂ JFL. **PERU** (85♂, 2♀): *Amazonas*: Falso Paquisha 800m Oct. 1♂ MUSM; *Cuzco*: Quincemil Nov. 1♂ MUSM; *Huánuco*: Tingo María May Jul. Aug. Dec. 2♂ MUSM, 4♂ AME, 1♂ USNM; Tournavista 2♂ AME; *Junín*: Chanchamayo 7♂ BMNH, 1♂ ZMHU, 2♂ BMB, 1♂ USNM; La Merced 2500' Aug. Sep. 6♂ BMNH; Río Colorado 2500' 1♂ BMNH; Río Ipoki May 1♂ MUSM; Satipo Oct. 5♂ AME, 3♂ AMNH; *Loreto*: Caballo Cocha May Jun. 1♀ BMNH; Iquitos Jul. Aug. Sep. 4♂ AMNH, 1♂ BMNH, 1♂ ZMHU, 1♂ AME, 1♂ MUSM, 1♂ USNM; Pebas 1♂ BMNH, 1♂ ZMHU; Río Cachiyacu 1♂ BMNH; upper Río Tapiche Feb. 1♂ AMNH; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Boca Río La Torre 300m Sep. Oct. 5♂ MUSM; Pakitza 400m Sep. 3♂ MUSM; Shintuya 450m Jul. 1♂ MUSM; *Pasco*: Alto Yurinaqui, ca. Eneñas 1400m Jun. 1♂ MUSM; Chuchurras 1♂ MUSM; Pozuzo 1♂ BMNH; *Puno*: Chaquimayo Aug.-Oct. 1♂ BMNH; La Unión 2000' Dec. Jan. 1♂ BMNH; San Gaban Mar. Apr. 2♂ BMNH; *San Martín*: Jepelacio 6♂, 1♀ AMNH; Tarapoto 1♂ BMNH, 1♂ MUSM; *Not located*: Huallaga 1♂ AMNH; upper Río Marañón Oct. 1♂ AMNH; middle Río Ucayali Feb. 1♂ AMNH; no specific locality Feb. 2♂ USNM, 2♂ BMNH, 1♂ BMB, 1♂ AMNH. **BOLIVIA** (14♂): *La Paz*: Caranavi 1200m Feb. 1♂ MUSM; Río Coroico 650m Mar. 1♂ AMNH; Río Songo 1♂ ZMHU; *Santa Cruz*: Buenavista 750m Aug.-Apr. 1♂ BMNH; Prov. Sara Feb. Apr. May 4♂ BMNH; Río Juntas 300m 1♂ ZMHU; San Mateo 1♂ BMNH; *Not located*: no specific locality 2♂ AMNH, 1♂ BMNH, 1♂ BMB. **BRAZIL** (14♂): *Amazonas*: Caiary-Vaupés Aug. 1♂ AMNH; Fonte Boa Jul. Aug. 5♂ BMNH; São Paulo de Olivença 2♂ BMNH, 1♂ ZMHU; Tefé 1♂ BMNH; *Pará*: Itaituba 1♂ ZMHU; Santarem 1♂ BMNH; *Rondônia*: Cacaulândia Oct. 1♂ USNM; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 1♂ FSCA. **GUYANA** (1♀): *Not located*: Essequibo River, 140 miles inland 1♀ BMNH. **FRENCH GUIANA** (2♂): *Laurent du Maroni*: St. Jean du Maroni 1♂ BMB; *Not located*: no specific locality 1♂ BMNH. **COUNTRY UNKNOWN** (11♂, 1♀): Amazon 1♂ MCZ; Amazonas 1♂ USNM; Napo 1♂ BMNH; Rio R. 1♀ BMNH; no specific locality 5♂ MCZ, 1♂ BMB, 1♂ MNHN, 1♂ KWJH.

Additional locality data: form "erotia": **VENEZUELA**: *Bolívar*: rd. to Icabarú (A. Neild, pers. comm.). **ECUADOR**: *Morona-Santiago*: Bomboiza Nov.; *Napo*: Apuya Aug. Oct.; Coca-Loreto rd., km 21, Mar.; El Capricho Oct.; Finca San Carlo Sep.; Río Tiputini Mar. Sep.; Tiguino Oct.; Tiputini Biodiversity Station Aug.; Yasuní Jul. (Willmott & Hall, sight records).

form "lerna": **MEXICO**: *Chiapas*: Cuenca de Tulijá; Selva Lacandona (de la Maza & de la Maza, 1993). **VENEZUELA**: *Bolívar*: rd. to Icabarú (A. Neild, pers. comm.). **ECUADOR**: *Morona-Santiago*: Bomboiza May; *Napo*: Apuya Apr. May Aug.-Oct.; Chichicorrumi Sep.; Finca San Carlo Aug. Sep.; Río

Tiputini Mar. Sep.; Satzayacu Apr.; Tiguino Oct.; *Pastaza*: Río Llandia S. José 950m Dec.; *Sucumbíos*: Laguna de Pañacocha Oct.; Pañacocha Oct.; Río Cuyabeno Sep. (Willmott & Hall, sight records).

Adelpha erotia caphira (Hewitson, 1869) **stat. rest.**

Figs. **87e,f**; *304*

Heterochroa caphira Hewitson (1869: 73)

TL: Valencia, Venezuela. **Types**: **BMNH**(M): **ST**♂: “Valencia, Venezuela Goering.//♂//Adelpha caphira Hew. Godman-Salvin Coll. 1916.-4.//Illustrated in the Butterflies of Venezuela A. Neild, 1996//112”; **BMNH**(T): **ST**?♀: “Illustrated in The Butterflies of Venezuela A. Neild, 1996//113//B.M. TYPE No. Rh. 9832 Heterochroa caphira ♀ Hew.// Venezuela Hewitson Coll. 79-69 Heterochroa lerna. 2.//caphira//Type// Syntype” [both examined]

=*Adelpha deleta* Fruhstorfer (1913: pl. 106e; 1915: 518) **syn. nov.**

TL: [Patar Peninsula, Venezuela]. **Types**: **BMNH**(R): **ST**♂: “Patao, Guiria Aug. 1891//erotia deleta Fruhst.//TYPE//Syntype//Illustrated in The Butterflies of Venezuela A. Neild, 1996//108” [examined]

Adelpha caphira Hew., Kirby (1871); *Adelpha erotia caphira* Hew., Hall (1938); *Adelpha lerna caphira* Hew., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished form the nominate by having a broader white postdiscal band on the DHW, and on the VFW in cells 2A-Cu_2 and Cu_2-Cu_1. The VHW postdiscal and submarginal series are consequently more closely spaced, and the ground colour of both wings is often predominantly dark brown, with only slight orange-brown scaling around the paler markings. I have only examined one specimen of the “erotia” form in this subspecies, and it is the easternmost record, suggesting that this subspecies may be monomorphic over much of its range. The “lerna” form has a reduced orange spot in cell Cu_1-M_3 on the DFW compared with the nominate subspecies, the postdiscal series and upper postdiscal band are typically divided by dark scaling in cell M_3-M_2 while the former may be a very dark orange, and forms occur in which the upper postdiscal band is almost entirely white.

Hewitson (1869) described this taxon based on the female, from a specimen or specimens in his own collection collected by Mr. Goering in Valencia, in Venezuela. There is a syntype male and possible syntype female (Fig. 87e,f) in the BMNH which match the description. Fruhstorfer (1913) figured *deleta* and later described it as a subspecies of *A. erotia* (Fruhstorfer, 1915: 518) based on a single male in the Tring Museum from the Patar peninsula in Venezuela, collected in August. Neild (1996) mentions a supposed syntype from Santa Rita in Colombia, but this is clearly not a true type specimen, as Neild noted, since it was not mentioned in the original description. The specimen figured by Neild (1996: pl. 3, fig. 107) as *A. e. deleta* from Chiriquí is also not this subspecies, but the nominate. The unique syntype of *deleta* is an “erotia” form and closely matches typical “lerna” forms of this taxon in having a broad postdiscal band and paler ventral surface, and I therefore synonymise the name with *caphira* (**syn. nov.**).

Range: This subspecies is known from extreme northeastern Venezuela in the Paria Peninsula, west through the Cordillera de la Costa into the Catatumbo region, between the Cordilleras de Mérida and Perijá, and along the eastern slopes of the Cordillera de Mérida. I have seen four Colombian specimens, which lack accurate locality data, that may have been collected either in the extreme north of the country, or possibly at the base of the Cordillera Oriental near the Venezuelan border.

Habitat and adult ecology: This subspecies is rare in collections and has been recorded up to at least 600m. The possible monomorphism throughout most of the range could be explained by the relatively greater proportion of *Adelpha* with *A. iphiclus*-like dorsal patterns in this region. The remarkable form with a white upper postdiscal band is very similar to sympatric forms of *A. barnesia leucas*, *A. naxia oteroi*, *A. malea ixia* and *A. paraena reyi*.

Specimens examined (14♂, 5♀):
Orange DFW form (“erotia”) (1♂):
VENEZUELA (1♂): *Sucre*: Potao, Güiria Aug. 1♂ BMNH.
White DFW form (“lerna”) (13♂, 5♀):
COLOMBIA (3♂, 1♀): “*Boyacá*”: Otanche Dec. 1♀ ESM-error; *Not located*: no specific locality 3♂ ZMHU. **VENEZUELA** (10♂, 4♀): *Carabobo*: Puerto Cabello 1♂, 2♀ ZMHU; Valencia 1♂ BMNH, 2♂ ZMHU; *Distrito Federal*: Caracas 1♂ AME; *Mérida*: Mérida 1♂ BMB, 1♂ USNM; *Táchira*: Río Frío P.N. El Tamá 600m Sep. 1♂ AFEN; *Zulia*: Carretera La Fría, km 82, 50m Jan. 1♀ MUSM; *Not located*: no specific locality 1♂, 1♀ BMNH, 1♂ MNHN.

Adelpha phylaca (H. W. Bates, 1866)

Figs. **88**; 121; 179; 258; *304*

Identification, taxonomy and variation:

This species is extremely similar to *A. messana*, but may be distinguished by typically being larger, with the hindwing tornus slightly less produced, in addition to several ventral surface characters. On the VFW, the first discal cell bar is more inclined to the costa, and the second bar is concave, so that the red-brown area between these bars widens posteriorly, while the fourth discal cell bar is also concave; in *A. messana*, all the discal cell bars are straighter, particularly the second bar, while the fourth cell bar is slightly convex, and the second and fourth cell bars are typically joined posteriorly by a dark brown line parallel with the median vein, so that the pale area between the second and fourth cell bars does not extend to touch the median vein. The ventral ground colour of *A. phylaca* is often an orange-brown, while that of *A. messana* is more red-brown or dark brown, particularly in the forewing subapical area. The ventral postdiscal and submarginal series in *A. phylaca* are distinctly silvery grey, whereas in *A. messana* they are a silvery white, while on the VHW of *A. phylaca* the postdiscal series are uniform throughout the wing, whereas in *A. messana* the dashes of the postdiscal series are typically heavier in cells M_1-Rs and Rs-Sc+R_1. The first and second discal cell bars on the VHW of *A. phylaca* are more broadly spaced, noticeably paler in the area between, and equidistant between the third discal cell bar and the basal red-brown line; in *A. messana*, they are closer together, almost forming a single dark band, which is closer to the third discal cell bar than to the basal red-brown line. In practice, there is seldom difficulty in identifying the two species, since the only area in which phenotypes with a similar dorsal wing pattern might be sympatric is Guatemala and Honduras, possibly to Costa Rica if *A. p. phylaca* genuinely occurs there. *Adelpha phylaca pseudaethalia*, which is the only subspecies of *A. phylaca* widely sympatric with *A. messana*, is easily distinguished from *A. messana messana* by the orange on the DFW extending broadly to the anal margin. *Adelpha phylaca* may be distinguished from *A. thesprotia* by having a more reddish brown ventral ground colour, particularly on the VFW, and by having a silvery grey submarginal dash on the VFW in cell Cu_1-M_3 of similar size to those in other cells. *Adelpha erotia*, *A. delinita* and *A. boeotia* are distinguished under their respective accounts. From other similar species, *A. phylaca* may be identified by having the postdiscal series in cell Cu_2-Cu_1 on the VFW fused to form a single, large pale spot (two dashes are visible in *A. fabricia*, *A. capucinus*, *A. malea*, *A. heraclea* and *A. pollina*). There is geographic variation in the extent of orange on the DFW, and in the presence or absence of an orange postdiscal band distal of the white DHW postdiscal band, and three subspecies are recognised.

Adelpha phylaca has the pale, dense, bunched scales at the base of vein Rs on the DHW possessed by all members of the *A. phylaca* group. In addition, it shares with *A. messana*, *A. thesprotia*, *A. erotia*, *A. lycorias* and *A. mesentina* the fused postdiscal series in cell Cu_2-Cu_1 and fused inner postdiscal series and postdiscal band in cell Cu_1-M_3 on the VFW. The male genitalia are most similar to those of *A. messana*, the valvae having a more pointed distal tip angled slightly ventrally. The similar male genitalia and very similar wing pattern suggests that *A. messana* and *A. phylaca* are sister taxa. The early stages of all of these species, with the exception of *A. pollina* which are not known, are also similar and distinctive compared to other *Adelpha* species, the most notable characters being the larval coloration (Fig. 121b) and extremely elongated, curved projection on the pupa (Fig. 121a).

Range and status: Mexico to western Ecuador, Colombia west of the Andes, to northwestern Venezuela in the eastern foothills of the Cordillera de Mérida. Common in a wide variety of lowland rain forest habitats from sea level to 1200m.

Specimens examined: 368 (301♂, 67♀)

Adelpha phylaca phylaca (H. W. Bates, 1866)

Figs. **88a,b**; *304*

Heterochroa phylaca Bates (1866: 135)

TL: Polochic Valley, Guatemala. **Types**: **BMNH**(T): **ST**♀: "B.C.A. Lep. Rhop. Adelpha phylaca Bates Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9827 Heterochroa phylaca ♀ Bates//Heterochroa phylaca ♀ Bates//Type. sp. figured//Polochic Valley F.D.G. & O.S.//♀//Type H.T." [examined]

Adelpha phylaca Bates, Kirby (1871); *Adelpha phylaca* f. *phylaca* Bates, D'Abrera (1987)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. p. pseudaethalia* by the postdiscal band on the DFW being white from the anal margin to vein Cu_1, with some orange scaling at the apical corner of the white block in cell Cu_2-Cu_1. There is variation in the size of the orange DFW subapical spots, in the ground colour of the ventral surface, which ranges from orange-brown to deep purplish brown, and in the expression of the VHW postdiscal series, which may be sharply defined, thin silvery grey dashes, or simply represented by a slightly lighter line in the ground colour.

Bates (1866) clearly described this species, based on an unspecified, number of female specimens from the Polochic valley, and a syntype female is in the BMNH. There are a number of additional specimens in the BMNH(M) from the Polochic valley with similar labels to the syntype, which might also be syntype specimens, but since there is no doubt as to the taxon described by Bates I believe a lectotype designation is unnecessary.

Range: I have seen specimens of this subspecies from Mexico to western Honduras. DeVries (1987) figures two specimens as *A. phylaca* which resemble this subspecies on the dorsal surface. The male is certainly *A. messana*, while the female almost certainly is too, but I cannot be sure without examining the ventral surface of the latter. I also initially regarded such specimens as representing *A. p. phylaca*, hence my comment in Neild (1996: 36) that the subspecies occurred as far east as Panama. Since then, I have re-examined specimens and found no *A. p. phylaca* east of Honduras. See also discussion concerning status of *A. p. pseudaethalia* and identification of *A. messana messana*.

Habitat and adult ecology: This subspecies is not uncommon in Mexico in tropical evergreen and semi-deciduous forest from sea level to 900m, where it flies from May to December (de la Maza, 1987; de la Maza & de la Maza, 1993). Although specimens are scarcer in collections from more easterly localities, these observations presumably apply throughout its range.

Specimens examined (60♂, 26♀):
MEXICO (46♂, 17♀): *Chiapas*: Comitán May Jun. 2♀ AME; Huixtla Jul. 1♂ AME; Mapastepec Sep. 1♂ AME; Musté Aug. 3♂ AMNH; San Jerónimo 450m Jul. 1♂ FSCA; San Quintín Sep. 1♂ AME; no specific locality 1♂ AMNH; *Guerrero*: Acahuizotla Jun. Oct. Nov. 4♂ AME; no specific locality 4♂ BMNH; *Jalisco*: La Cumbre 1♂ AMNH; *Michoacán*: Coahuayana Jun. Aug. 2♂ AME; *Oaxaca*: Candelaria Loxicha 550m Sep. Oct. Nov. 2♂, 1♀ AMNH, 3♂, 1♀ AME; Chiltepec Sep. 1♂, 1♀ AMNH; Chimalapa Sep. 1♀ AME; Mixtepec Dec. 1♀ AMNH; Soyolapan el Bajo Oct. 1♂ AMNH; Tuxtepec 1♀ AMNH; Valle Nacional Jul. 800m 1♂ MUSM; *Puebla*: Tequelquitla 625m Aug. 1♂ MUSM; *Veracruz*: Córdoba 2♂ AMNH, 1♂ BMNH; Cuesta de Misantla 1♀ BMNH; Dos Amates Sep. 1♂ AME; El Vigía Sep. 1♂ AME; Misantla 1♂ MCZ; Presidio Jun.-Sep. 4♂, 3♀ AME; Santa Rosa Aug. 3♂ USNM; Sierra Mojarra Jul. 2♀ AME; Tezonapa Jun. 1♀ AME; Tierra Blanca Aug. 1♂ AME; *Not located*: no specific locality 3♂, 1♀ AMNH, 1♀ BMB, 1♂ MNHN. **GUATEMALA** (7♂, 8♀): *Alta Verapaz*: Polochic Valley 4♂, 1♀ BMNH; *Escuintla*: Palín 3600' Jul. 1♀ BMB; *Izabal*: Puerto Barrios 1♀ BMB; *Retalhuleu*: San Sebastián 4♀ USNM; *Suchitapéquez*: Mazatenango Jul. Aug. 1♂ BMB; *Not located*: no specific locality 2♂ ZMHU, 1♀ MCZ. **EL SALVADOR** (4♂, 1♀): *La Libertad*: La Libertad 10m Dec. 1♂ AME; *San Salvador*: Ilopango 1200' Sep. Oct. 1♂ BMB; San Salvador Aug. 1♂ AME; Santa Tecla 900m Jul. 1♀ AME; *Sonsonate*: Izalco 400m Dec. 1♂ AME. **HONDURAS** (1♂): *Atlántida*: La Ceiba, 18 km W., May 1♂ USNM. **COUNTRY UNKNOWN** (2♂): no specific locality 1♂ BMB, 1♂ USNM.

Additional locality data: **MEXICO**: *Chiapas*: throughout - see de la Maza & de la Maza (1993); *Colima*: Agua Dulce 600m Nov.; Platanarillos 900m Jun. Nov. Dec. (Warren *et al*., 1998); *Guerrero*: El Faisanal; *Oaxaca*: Metates; Portillo del Rayo (de la Maza, 1987); *Jalisco*: Barra de Navidad Dec.; Chico's Paradise Dec.; La Calera Sep. Nov.; Mismaloya Mar. Apr. Oct. Dec.; Puerto Vallarta Apr. Dec.; Río Tomatlán at hwy 200 Jan.; Yelapa Dec. (Vargas *et al*., 1996). **BELIZE**: *Belize*; *Cayo*: Slate Creek Preserve (Meerman, 1999).

Adelpha phylaca pseudaethalia Hall, 1938

Figs. **88c,d**; 121a,b; 179a,b; 258a,b; *304*

Adelpha phylaca form *pseudaethalia* Hall (1938: 210)

TL: Costa Rica. **Types**: **BMNH**(M): **HT**?♀: "Holotype ♀ Adelpha phylaca f. pseudaethalia Hall G. Lamas det. 1987//16 86//B.C.A. Lep. Rhop. Adelpha erotia Hew. Godman-Salvin Coll. 1916.-4.//Irazú 6-7000' H. Rogers//♀//Holotype" [examined]

Adelpha erotia Hew., Godman & Salvin (1884) in part, misid.; *Limenitis (Adelpha) erotia* Hew., Ross (1976) misid.?; *Adelpha boeotia oberthurii* Boisd., Steinhauser & Miller (1977: figs. 15, 16), de la Maza (1987), de la Maza & de la Maza (1993) misid.; *Adelpha phylaca aethalia* Fldr., Aiello (1984) misid.; *Adelpha boeotia boeotia* Fldr., DeVries (1987) in part?; *Adelpha phylaca* f. *frusina* Fruhst., D'Abrera (1987) misid.; *Adelpha phylaca pseudaethalia* Hall, Lamas & Small (1992)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate in having the DFW postdiscal band almost entirely orange, with some specimens having slight whitish scaling at the anal margin of the DFW. There is variation in the size of the orange DFW subapical spots, in addition to the width and evenness of the orange DFW postdiscal band; central west Ecuadorian specimens have especially narrow bands, in addition to narrower white DHW postdiscal bands.

Hall (1938) described this taxon as a form of *A. phylaca* and stated that it resembled *A. malea aethalia*, but differed in having the DFW orange band "somewhat narrowed posteriorly and scaled with whitish on the inner margin". He stated that the type was in the British Museum from Costa Rica, but gave no precise locality or indication of the sex of the specimen. The putative holotype in the BMNH, a female from Irazú, does not particularly match the original description since the DFW band only barely narrows posteriorly and although the colour of the band is paler, it is arguably scaled with whitish at the inner margin. However, the only other similar taxa with specimens in the BMNH from Costa Rica, which Hall might possibly have regarded as a form of *A. phylaca*, are *A. delinita utina* and *A. boeotia oberthurii*, but since Hall (1938) appeared to correctly associate all the respective taxa of each of these species, it seems very unlikely that he would have erred in describing a specimen as a form of *A. phylaca*. In addition, a female specimen of this taxon from Guatemala in Hall's collection at the BMB, figured by Neild (1996: pl. 2, fig. 77), is labelled as a paratype, although it officially lacks that status since it was not mentioned in the original description. I therefore regard the name *pseudaethalia* as genuinely referring to this taxon, though I remain uncertain about the validity of the supposed holotype.

This taxon appears to be sympatric with the nominate subspecies from the state of Chiapas (possibly Veracruz) in eastern Mexico to western Honduras. My comment in Neild (1996: 36) that the nominate subspecies occurred as far east as Panama was based on misidentification of *A. messana messana*. Within this area of overlap I have examined 30 specimens of *A. p. phylaca* and 15 specimens of *A. p. pseudaethalia*, with 4 of the latter having variable amounts of white in cell 2A-Cu$_2$ on the DFW. Otherwise, the phenotypes are stable and readily identifiable throughout this region, and there is no evidence of clinal variation in the amount of DFW orange within the ranges of either subspecies. This taxonomic problem is similar to that occurring in many mimetic ithomiine taxa, particularly in the genera *Melinaea* and *Mechanitis*, where highly distinctive phenotypes exclusively occupy large geographic areas but also overlap in a broad areas of sympatry in which there are relatively few intermediate specimens. I retain *pseudaethalia* and *phylaca* as distinct subspecies since their identification presents no problem and it aids communication about the taxa, and since both occur monomorphically over large areas.

Due to sympatry of these two taxa in Mexico, *A. p. pseudaethalia* has often been regarded as a species distinct from *A. p. phylaca*, being misidentified as *A. erotia* by Godman & Salvin (1884) and *A. boeotia oberthurii* by Steinhauser & Miller (1977), de la Maza (1987) and de la Maza & de la Maza (1993). However, I do not believe the two taxa to be distinct species since there are no genitalic or ventral wing pattern differences, intermediate specimens are known and analogous dorsal forewing pattern dimorphism is exhibited in related species such as *A. mesentina*, *A. erotia* and *A. messana*. I suspect that this taxon in Costa Rica was also misidentified as *A. boeotia* by DeVries (1987), despite the figure of *A. boeotia* being correct, since he figured a male, and almost certainly a female, of *A. messana messana* as *A. p. phylaca*. I have seen no specimens of *A. p. phylaca* from Costa Rica, but it is just possible that the phenotype occurs there. The hostplant records given by DeVries (1987) for *A. boeotia* (*Luehea seemannii* and *Cecropia*) are typical of *A. p. pseudaethalia*, and examination of the adult voucher specimen in the PJD confirms that the descriptions of the fifth instar larva and pupa of "*A. boeotia*" in DeVries (1987) actually apply to *A. p. pseudaethalia*.

Range: This subspecies is known from the state of Chiapas in Mexico throughout Central America to northwestern Venezuela, west of the Cordillera de Mérida, south to western Ecuador. Ross' (1976) record of "*Limenitis erotia*" from the Sierra de Tuxtla, and de la Maza's (1987) report of "*A. boeotia oberthurii*" from El Vigía, both in Veracruz (Mexico), may be this species; certainly de la Maza's figure of *A. b. oberthurii* is *A. phylaca pseudaethalia*, but this may be a specimen from Chiapas, also listed by him as a locality for the taxon (and see de la Maza & de la Maza (1985)).

Immature stages: Aiello (1984) reared this subspecies in Panama. Eggs are deposited on the upper surface of a leaf at the tip and are morphologically typical of the genus. The mature larva (Fig. 121b; also Aiello, fig. 4, and Aiello (1991)) is greenish or pinkish grey and speckled with darker grey. The pattern is similar to all other known members of the *A. phylaca* group, in the sides of the thoracic segments and A1 and A2 being dark brown, and there is a distinctive brown oval on either side of A5, just below the scolus, in some individuals. The scoli are similar in form to *A. lycorias melanthe*, but with shorter lateral spines. The head capsule is unpatterned and setose. The pupa (Fig. 121a; also Aiello, fig. 6) is typical of the *A. phylaca* group, and has small, slightly laterally pointed head horns. DeVries' (1987) descriptions of the immature stages of "*boeotia boeotia*", and the hostplant record of *Luehea* cited under that name, also apply to *A. p. pseudaethalia*.

Larval behaviour is similar to *A. lycorias melanthe*. Minimum and total development times have been reported for the immature stages, with a minimum total development time of 41 days (Aiello, 1984).

Habitat and adult ecology: At the edge of its range in Mexico, this subspecies has only been reported from lowland rain forest from 100-500m from June to September (de la Maza, 1987; de la Maza & de la Maza, 1993). However, it is common to very common throughout the remainder of its range in a wide variety of habitats, in primary and extensively disturbed wet and moist lowland forest, from sea level to 1000m, possibly to 1300m if the report of Raguso & Gloster (1996) of this species from western Ecuador, as *A.* sp. aff. *phylaca*, proves to be this species. In western Ecuador, I have found males to be attracted to traps baited with rotting fish along wide paths, river sides and forest edges, as well as in light gaps in primary forest. Males also perch along forest edges from 4-5m above the ground.

Specimens examined (238♂, 39♀): † - trans. to *A. p. phylaca*, variable white in cell 2A-Cu$_2$ DFW.

MEXICO (3♂, 1♀): *Chiapas*: Comitán Jul. 1♀ AME; Ocozingo Jul. 1♂ AME; Pichucalco Sep. 1♂ AME; no specific locality Oct. 1♂ AMNH. **EL SALVADOR** (2♀): *Santa Ana*: Cerro San Jacinto 800m Jul. 2♀ AME. **GUATEMALA** (3♂, 3♀): *Izabal*: Cayuga 1♀ USNM; Quiriguá 1♀ BMB; *Alta Verapaz*: Polochic Valley 3♂†, 1♀† BMNH. **HONDURAS** (2♂, 1♀): *Cortés*: San Pedro Sula 1♂ BMNH; *Not located*: no specific locality 1♂ ZMHU, 1♀† AMNH. **COSTA RICA** (6♂, 4♀): *Alajuela*: San Mateo 1♂ USNM; *Cartago*: Irazú 6-7000' 1♀ BMNH; Peralta 2000' 1♀ USNM; Turrialba 2000' May Jun. Sep. 1♂, 2♀ USNM, 1♂ AME; *Puntarenas*: Palmar Norte Aug. 1♂ USNM; *Not located*: no specific locality 2♂ BMNH. **PANAMA** (36♂, 16♀): *Chiriquí*: Armuelles 1♀ AMNH; Chiriquí 1♂ BMNH, 3♂ ZMHU, 1♀ MCZ; Lino 800m 1♂ USNM; *Colón*: Colón 1000' Mar. 1♀ USNM; Gamboa Oct. Nov. 3♂ USNM; Gatún May 2♀ USNM; Lion Hill 1♀ BMNH; Piña 200m May Jul. 2♂, 1♀ AME; *Darién*: Caña Jul. Aug. 10♂ USNM; *Panamá*: nr. Altos de Pacora 750m Mar. 1♂ USNM; Bayano Jan. Oct.-Dec. 3♂, 2♀ USNM; Cerro Campana 2000' Sep. Dec. 1♂, 3♀ USNM; Cerro Jefe May 1♀ USNM; La Pita Aug. Oct. 2♂ USNM; Madden Forest Jul. 2♂ USNM; Río Trinidad 1♀ AMNH; *Not located*: Canal zone Jul. Dec. 3♂ BMNH; Cord. San Blas Jun. Dec. 2♂ USNM; Los Ríos, Canal zone Jan. Dec. 2♂ USNM; T.I. Hwy. Dec. 2♀ BMNH. **COLOMBIA** (152♂, 4♀): *Antioquia*: Casabe, Río Magdalena Oct. Nov. 1♂ AMNH; Crystallina 1100' Jun. Jul. 1♂ BMB; Medellín 1♂ BMB; *Boyacá*: Muzo Jun. Jul. 2♂ BMNH, 1♂ AME, 1♂ BMB, 1♂ MCZ; Otanche 1♀ JFL; head Río Carare 1♂ USNM; *Caldas*: Victoria Mar. 1♀ ESM; *Cauca*: Popayán 1♂ BMNH; *Chocó*: Guarato Jan. 1♂ USNM; *Cundinamarca*: Bogotá 61♂, 1♀ BMNH, 1♂ ZMHU, 1♂ BMB, 1♂ MNHN, 1♂ USNM; env. Bogotá 22♂ BMNH; Cananche 1♂ BMNH; La Mesa 4000' May Jun. 1♂ BMB; *Risaralda*: Pueblo Rico, Hda. Bacori 450m Oct. 1♂ MUSM; *Santander*: El Centro 3♂ AMNH; La Borroscosa Dec. 1♂ AMNH; La Lechera Feb. 1♂ AMNH; La Soledad Dec. 1♂ AMNH; *Tolima*: El Santuário 1♂ BMNH; *Valle de Cauca*: Bitaco 800m May 1♂ KWJH; Río Dagua 2♂ BMNH; Río San Marcos, Río Anchicayá Apr. 1♂ LMC; *Not located*: Cañita Oct. 1♀ USNM; Cauca 3♂ AMNH; San Rafael 3500' Jun. Jul. 3♂ BMB; no specific locality 30♂ AMNH, 1♂ BMNH, 1♂ BMB, 1♂ MCZ, 1♂ USNM. **VENEZUELA** (8♂, 4♀): *Carabobo*: Puerto Cabello 1♂ ZMHU; Las Quiguas Nov.-Mar. 1♀ BMNH; San Esteban Jun.

Aug. 2♂ BMNH; *Lara*: Sanare 1♂ MNHN; *Táchira*: San Juan de Colón 550m Jun. 1♂ AFEN; *Trujillo*: La Gira Betijoque 560m Dec. 1♂ AFEN; *Zulia*: El Tucuco 200m Jul. 1♀ AFEN; Misión El Rosario 50m Jan. 1♂ MUSM; *Not located*: no specific locality 1♂, 2♀ BMNH. **ECUADOR** (20♂, 3♀): *Cañar*: Manta Real 500m Aug. 1♂ KWJH; *Esmeraldas*: Esmeraldas Jul. 1♀ AME; La Punta, km 44 Lita-San Lorenzo rd. 300m Jul. Aug. 1♂, 1♀ KWJH; San Lorenzo-Lita rd., km 20, 100m Aug. 1♂ KWJH; San Miguel, Río San Miguel Aug. 1♂ KWJH; *Imbabura*: Paramba 3500' 2♂ BMNH; *Los Ríos*: C. C. Río Palenque 200m Jul. Sep. 1♂ FSCA, 1♂ KWJH; Quevedo 5♂ BMNH; *Pichincha*: Río Tanti Aug. 3♂ KWJH; *Not located*: Machala-Guayaquil Nov. 1♀ MUSM; Oriente 3♂ AMNH-error; Pacific slope 1♂ USNM. **COUNTRY UNKNOWN** (8♂, 1♀): Amaz. 1♂ MCZ; no specific locality 5♂ MCZ, 1♀ BMNH, 2♂ MNHN.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona (de la Maza & de la Maza, 1993); Chajul; *Veracruz*: El Vigía (de la Maza, 1987). **ECUADOR**: *Carchi*: Lita, ridge east of Río Baboso 1000m Mar. Jul.-Sep.; *Esmeraldas*: El Durango Jul. Sep.; El Encanto Jul.; Finca Doña Bella Sep.; Finca Durán 600m Jul.; Río Piguambí Jul.; *Pichincha*: Río Tanti May Jun. (Willmott & Hall, sight records).

Adelpha phylaca joffrei Neild, 1996

Figs. **88e,f**; *304*

Adelpha phylaca joffrei Neild (1996: 36, pl. 2, 78-80)

TL: Alto Río Doradas, Edo. Táchira, Venezuela. **Types** (all Venezuela): **MIZA**: **HT**♂: Alto Río Doradas 600m Mar.; [original photograph examined]; **MALUZ**: **PT**♂: Río Caparo, 30 km E. El Canton, Barinas Feb.; **AFEN**: **PT**♀: Río Frío, Táchira 800m Nov.; 2**PT**♂: Hda. Pánaga, Río Chucurí, Táchira 800m; **BMNH**: **PT**♂: Río Frío, Táchira 800m Nov. [all examined]; **TP**: **PT**♂, **PT**♀: Hda. Pánaga, Río Chucurí, Táchira 800m Mar. Aug.; **JB**: **PT**♂: La Chucurí, Táchira Aug.; **RM**: **PT**♂: Río Frío, Táchira Oct. [not examined]

Identification, taxonomy and variation:

This subspecies is distinguished from the remaining two by the orange scaling bordering the distal edge of the white DHW postdiscal band. The width of the orange is variable, from a thin thread to a thicker band, and the postdiscal band may be tinted with orange in cells Cu_2-Sc+R_1.

Neild (1996) described this subspecies from a series of eight males and two females, and I have examined the original illustration of the holotype and several paratypes.

Range: Eastern foothills of the Cordillera de Mérida in western Venezuela, the Apure region, possibly also extending into extreme northern Colombia at the base of the Cordillera Oriental. This is the only area where this species occurs to the east of the Andes, and is indicative of the mixed biogeographical origins of the Apure fauna (see Neild, 1996).

Habitat and adult ecology: Nothing has been reported on the behaviour of this recently discovered subspecies, which has been recorded up to 1200m from August to March.

Specimens examined (3♂, 2♀):

VENEZUELA (3♂, 2♀): *Barinas*: Barinitas-Sto. Domingo, c. km 30, 1200m Oct. 1♀ AFEN; *Táchira*: Hda. Pánaga, Río Chucurí 2♂ AFEN; Río Frío, P.N. El Tamá 1♂ BMNH, 1♀ AFEN.

Additional locality data: **VENEZUELA**: see type data above (Neild, 1996).

Adelpha messana (C. & R. Felder, 1867)

Figs. **89**; 180; *305*

Identification, taxonomy and variation:

Adelpha messana is very similar to *A. phylaca*, and the characters that distinguish it are discussed under that species. *Adelpha thesprotia* is distinguished by being slightly larger, in addition to a number of ventral wing pattern characters: on the VFW of *A. thesprotia*, the second and fourth discal cell bars are concave instead of straight or convex, and the silver-grey dash of the inner submarginal series in cell Cu_1-M_3 is absent or very much reduced compared to that in cell Cu_2-Cu_1, while in *A. messana* it is of equal size; on the VHW, the second and third discal cell bars are typically black in *A. thesprotia* but red-brown in *A. messana*, and the ground colour distal of the white postdiscal band is entirely dark brown in *A. thesprotia*, with the exception of red-brown ovals at the end of each vein and a red-brown line immediately basal to the outer postdiscal series, while it is entirely red-brown in *A. messana*. *Adelpha erotia* and *A. delinita* are distinguished under those species. *Adelpha messana* is distinguished from all other similar species by having the postdiscal series on the VFW in cell Cu_2-Cu_1 fused to form a single, large pale spot, while the postdiscal series and postdiscal band are entirely fused in cell Cu_1-M_3.

Adelpha messana is considered a member of the *A. phylaca* group for the same reasons as *A. phylaca*, and the two are probable sister species; the genitalia of both sexes show no consistent differences.

Range and status: Guatemala to northwestern Ecuador, Venezuela to Bolivia, Amazonian Brazil and the Guianas. Uncommon to rare in relatively intact lowland rain forest from sea level to 900m.

Specimens examined: 134 (122♂, 12♀)

Adelpha messana messana (C. & R. Felder, 1867)

Figs. **89a-d**; *305*

Heterochroa messana C. & R. Felder (1867: 418)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//Bogotá Lindig Type//Felder Colln.//messana n.//messana Felder//Illustrated in The Butterflies of Venezuela A. Neild, 1996//154" [examined]

=*Adelpha aufidia* Fruhstorfer (1915: 525) **stat. nov.**

TL: "Colombia, Bogotá (?)". **Types**: **BMNH**(R): **HT**♂: "messana aufidia Fruhst.//Nova Granada Lindig//Holotype//Type//Felder Colln." [examined]

Adelpha lerna var. *messana* Fldr., Kirby (1871); *Adelpha erotia* Hew., Godman & Salvin (1884) in part, misid.; *Adelpha messana* Fldr., Fruhstorfer (1915); *Adelpha ixia* Fldr., Fruhstorfer (1915) in part, misid.; =*Adelpha ixia ixia* Fldr., Hall (1938); *Adelpha phylaca* Bates, DeVries (1987: pl. 27, fig. 7, 8) misid.; *Adelpha ixia leucas* Fruhst., Aiello (1991) misid.; *Adelpha phylaca phylaca* Bates, Willmott (pers. comm. *In*: Neild, 1996) misid.; *Adelpha messana* Fldr., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. messana delphicola* by always having the width of the postdiscal band in cell 2A-Cu_2 approximately half that in cell Cu_2-Cu_1, with white scaling in the band at least posterior to vein 2A and typically to vein Cu_1. All of the specimens that I have examined from the Magdalena valley in Colombia, that is the eastern slopes of the Cordillera Central and western slopes of the Cordillera Oriental, are similar to the syntype of *messana* and show very little variation (Fig. 89a). There is occasionally an orange subapical spot of varying size in cell M_2-M_1 on the DFW, but the orange marking in cell Cu_1-M_3 is always isolated from the white postdiscal block in cell Cu_2-Cu_1, with very sparse orange scales in the dark area between, extending to the apical corner of the white block. Almost all of the specimens that I have examined from the western slopes of the Colombian Cordillera Occidental to northwestern Ecuador, to Guatemala, differ in having the orange on the DFW extending at least into the anterior half of cell Cu_2-Cu_1 and across the cell to the anterior half of the white block in that cell (Fig. 89c). Some specimens have only light orange scaling around the anterior edge of the white block, others have orange extending over the block almost into cell Cu_2-Cu_1. The single female specimen reared by Aiello (1991) in Panama and identified as "*A. ixia leucas*" is typical of the subspecies except in having heavier orange scaling at the apical corner of the white DFW postdiscal block in cell Cu_2-Cu_1. Known specimens from western Ecuador have the most extensive orange, which sparsely covers all of the white block in cell 2A-Cu_2, while the white DHW postdiscal band is much narrower than in all other specimens examined (Fig. 89c). However, since there is much individual variation in the extent of the orange, and I have examined relatively few specimens west of the Andes and none from the Cauca Valley or northern tip of the Colombian Cordillera Central, a potential transition area, I treat all of these specimens as the nominate subspecies.

Felder & Felder (1867) described this species from an unspecified number of male specimens in their collection collected by Lindig and labelled "Bogotá". Their original description compared it with *A. ixia*, from which the taxon supposedly differed in having narrower bands and unequally spaced VHW postdiscal and submarginal series. A syntype male is in the BMNH and was figured by Neild (1996). Fruhstorfer (1915) described a new species, *Adelpha aufidia*, based on a single male specimen which differed from typical *A. messana* in having an extra orange DFW subapical spot in cell M_2-M_1, in addition to a slightly narrower white DFW postdiscal band and orange extending further posteriorly on the DFW. The specimen was reputedly in the Tring Museum and had been collected by Lindig in Colombia, and the holotype is now in the BMNH(R). However, all of these differences cited by Fruhstorfer (1915) represent minor individual variation, and I therefore synonymise *aufidia* with *messana* (**stat. nov.**).

The systematic status of this taxon has always been confused, until Neild (1996) finally recognised and treated it correctly as a full species, distinct from both *A. barnesia leucas* and *A. malea ixia*, with which it is sympatric. Fruhstorfer (1915) regarded it as a distinct species, but specimens of *A. messana* in the BMNH were also identified by him as *A. ixia*. Hall (1938) regarded it, along with *A. barnesia leucas*, as conspecific with *A. malea ixia*, while both DeVries (1987) and myself (*In*: Neild, 1996) misidentified Costa Rican and Panamanian specimens as *A. phylaca phylaca*. In addition to the ventral characters discussed under *A. phylaca*, Central American specimens of *A. messana* may be distinguished on the dorsal surface from *A. phylaca* by the orange on the forewing in cell Cu_1-M_3 extending right across the white block in cell Cu_2-Cu_1 to the basal edge, and covering more of the block, rather than just touching the apical corner.

Range: Typical specimens of the nominate subspecies occur from northwestern Venezuela, west of the Cordillera de Mérida, throughout the western slope of the Cordillera Oriental and eastern slope of the Cordillera Central in Colombia. Specimens from Guatemala to northwestern Ecuador possibly represent a distinct subspecies, while I have seen no specimens from the Cauca valley.

Immature stages: Aiello (1991) reared two larvae of this species on *Luehea seemannii* (Tiliaceae), although the butterfly was identified as *A. ixia leucas*. The fourth instar larvae are rusty brown, and construct similar perches from leaf veins and accumulations of frass and leaf material as in most other *Adelpha*. Larvae rest on the perches when not feeding, and also moult there. The fifth instar has a similar pattern to other members of the *A. phylaca* group, being beige with the sides of the thorax to the second abdominal segment red-brown. The scoli are also typical of this group, being all similar in form with intermediate as well as terminal spines. The pupa is straw-coloured and typical in form of this species group, with the second abdominal segment expanded to form a very large dorsal hook. One of the larvae died before pupation, probably due to an entomogenous fungus.

Habitat and adult ecology: This subspecies is apparently locally not uncommon in Colombia, but elsewhere in its range it is rare. DeVries' (1987) comments on *A. phylaca* in Costa Rica probably apply to this species; the species is infrequently seen in nature, and occurs in rain forest habitats from 300-800m. Both sexes visit rotting fruits along forest edges and in light gaps, particularly guava (Myrtaceae, *Psidium suave*). I have found males in western Ecuador in selectively logged and undisturbed primary forest light gaps, always in traps baited with rotting fish, usually in the subcanopy. I have only recorded the species there towards the end of the wet season, suggesting that it may be seasonal.

Specimens examined (89♂, 5♀):

Typical *messana messana* (75♂, 2♀):

"**HONDURAS**" (1♂): *Cortés*: San Pedro Sula 1♂ BMNH-error. **COLOMBIA** (69♂, 2♀): *Antioquia*: Crystallina 1100' Jun. Jul. 1♂ BMB; *Boyacá*: Muzo Jun. Jul. 2♂ AME, 2♂ BMB, 1♂ AMNH; *Cundinamarca*: Bogotá 34♂ BMNH; Région du Bogotá 5♂ BMNH; Cananche 1♀ BMNH; *Tolima*: Río Chili 1♀ BMNH; *Not located*: Interior of Colombia 1♂ BMNH; Magdalena Valley May 1♂ BMNH; no specific locality 11♂ AMNH, 2♂ BMNH, 3♂ ZMHU, 4♂ BMB, 2♂ MCZ. **VENEZUELA** (1♂): no specific locality 1♂ BMNH. "**BRAZIL**" (1♂): *Rio de Janeiro*: Rio Janeiro 1♂ BMNH-error. **COUNTRY UNKNOWN** (3♂): no specific locality 1♂ MNHN, 2♂ MCZ.

ssp. nov.? (14♂, 3♀):

GUATEMALA (1♂): *Not located*: "Guatemala coll. Weeks" 1♂ MCZ. **COSTA RICA** (1♀): no specific locality 1♀ AMNH. **PANAMA** (8♂, 2♀): *Chiriquí*: "Bugaba 800-1500' Champion//♂//B.C.A. Lep. Rhop. Adelpha erotia Hew. Godman-Salvin Coll. 1916.-4.//16 86" 1♂ BMNH; *Colón*: Pipeline rd. nr. Gamboa Nov. 1♀ STRI; *Darién*: Caña 400m Aug. 1♂ USNM; *Panamá*: Farfán Jun. Jul. 5♂ USNM; *Veraguas*: "Veraguas Panama Arce//♂" 1♂ BMNH; *Not located*: Los Ríos, Canal zone Dec. 1♀ USNM. **COLOMBIA** (1♂): *Risaralda*: Hda. Bacorí, Pblo. Rico Apr. 1♂ MHNUC. **ECUADOR** (3♂): *Esmeraldas*: El Encanto, km 16 Lita-San Lorenzo rd. 900m Jul. 2♂ KWJH; Río Chuchuví 800m Jul. 1♂ KWJH.

Adelpha messana delphicola Fruhstorfer, 1909 **stat. nov.**

Figs. **89e,f**; 180a,b; *305*

Adelpha delphicola Fruhstorfer (1909b: 358)

TL: Pebas [Peru]. **OTL**: Amazonas. **Types**: **BMNH**(M): **LT**♂: "Pebas. Mai//delphicola Fruhst.s//Fruhstorfer Coll. BM 1937-285//Illustrated in the Butterflies of Venezuela A. Neild, 1996//81"; **PLT**♂: "Amaz. S. Fruhstorfer//Fruhstorfer Coll. BM 1937-285//Illustrated in the Butterflies of Venezuela A. Neild, 1996//82" [both examined]

Adelpha aethalia Fldr., Barcant (1970) misid. ?; *Adelpha phylaca delphicola* Fruhst., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account. There is slight individual variation in the colour of the ventral surface, from purplish to reddish brown, and in the size of the orange DFW subapical spots.

Fruhstorfer (1909b) described this taxon as a species based on an unspecified number of specimens, including at least one male, at least some of which were brought back by Dr. Theodore Koch-Grünberg from South America. The species was compared with *A. erotia*, but stated to have a darker ventral ground colour and more linear postdiscal and submarginal series on the VHW. The male genitalia were also figured, and beneath the figure the locality was given as "Amazonas". The brevity of the original description and lack of a figure either there or in Fruhstorfer (1915) has made the systematic status of the taxon something of a mystery. Fruhstorfer (1915) described a further three subspecies of "*A. delphicola*", all of which prove, on examination of syntypes, to be synonymous with *A. thesprotia*. For this reason, Hall (1938) regarded *delphicola* as applying to *A. thesprotia* as treated here, but despite examining the syntype of *A. thesprotia*, and correctly pointing out the wing pattern differences between *A. thesprotia* and *A. capucinus*, he inexplicably applied the name *thesprotia* to *A. capucinus* and *delphicola* to *A. thesprotia*. All subsequent authors, except Neild (1996), regarded *delphicola* as the correct name for *A. thesprotia* as treated here. However, the originally figured male genitalia differ noticeably from all specimens of *A. thesprotia* that I have dissected in having a more tapering and pointed posterior portion of the valvae, but are identical to specimens of *A. messana delphicola* as treated here and *A. phylaca*. Fruhstorfer's (1915) comment that the name *delphicola* was based on considerably smaller specimens compared with typical *A. thesprotia* also fits this taxon. After I had concluded that the name *delphicola* most probably applied to this taxon, Neild (1996) located two specimens in the BMNH, from Fruhstorfer's collection, which appeared to be syntypes. One of these, labelled "Amaz. S.", lacks an abdomen and is very probably the specimen dissected by Fruhstorfer. The second is from Pebas and bears a Fruhstorfer handwritten label identifying it as *delphicola*, and was designated the lectotype by Neild (1996). The majority of specimens collected by Koch-Grünberg bear a characteristic label stating Obër Río Uaupés (G. Lamas, pers. comm.), which does not match either of the two putative syntypes. However, Fruhstorfer (1915) later stated that the name *delphicola* was based on specimens from the Upper Río Uaupés, the Upper Amazon and Peru, while the only cited locality in the original description is "Amazonas", so I regard both of these specimens as valid syntypes and accept Neild's lectotype designation.

Neild and I concluded that *delphicola* appeared to represent an Amazonian subspecies of *A. phylaca*, based on similar wing pattern and the indistinguishable male genitalia, and Neild (1996) treated the taxon as such. However, I have subsequently found several ventral wing pattern characters in *delphicola* that are diagnostic of *A. messana messana*, and given the recent discovery of specimens in western Ecuador that differ from typical specimens of *delphicola* only in having the DFW postdiscal band reduced in width in cell 2A-Cu_2, with white scaling at the anal margin, I conclude that *delphicola* is best placed as a subspecies of *A. messana* (**stat. nov.**). The characters that both *A. m. messana* and *A. m. delphicola* share that differentiate them from *A. phylaca* are discussed under the identification of the latter species.

Range: Southern Venezuela to Bolivia, throughout Amazonian Brazil and the Guianas. Barcant (1970: 132, pl. 5) figures the dorsal surface of a specimen as "*Adelpha aethalia*", collected on St. Ann's ridge in Trinidad at 1600' in September 1958, which is either this species, *A. thesprotia* or possibly *A. erotia*. However, certain identification is not possible without an examination of the ventral surface.

Habitat and adult ecology: This taxon is rare in collections, but I have found it to be widespread in eastern Ecuador in primary lowland rain forest below 700m, where it is most frequently encountered in the wet season and early dry season. All of the specimens that I have seen have been solitary males, attracted to rotting fish in subcanopy traps, typically in ridge top light gaps.

Specimens examined (34♂, 7♀):

VENEZUELA (1♀): *Delta Amacuro*: Río Acure 1♀ AME. **COLOMBIA** (1♂): no specific locality 1♂ AMNH. **ECUADOR** (9♂): *Napo*: Apuya 600m Feb. Aug. 2♂ KWJH; Chichicorrumi 450m Feb. 1♂ KWJH; Finca San Carlo 600m Sep. 1♂ KWJH; Napo May 1♂ AME; Pimpilala 600m Oct. 1♂ KWJH; Río Tiputini 300m Sep. 1♂ KWJH; Satzayacu 700m Sep. 1♂ DAT; *Pastaza*: Puyo-Canelos rd., km 30, 600m Oct. 1♂ KWJH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m May Oct. 2♂ PJD. **PERU** (9♂): *Huánuco*: Tingo María May Aug. 2♂ AME; *Junín*: Chanchamayo 1♂ BMNH; *Loreto*: Pebas May 1♂ BMNH; San Roque 3♂ AME; *Pasco*: Pozuzo 800m Apr. 1♂ BMB; *Not located*: Río Huallaga 1♂ AMNH. **BOLIVIA** (2♂): *Santa Cruz*: Buenavista Mar. 1♂ AME; *Not located*: no specific locality 1♂ BMNH. **BRAZIL** (8♂, 3♀): *Amazonas*: Benjamin Constant Oct. 1♂ AMNH; Caiary-Vaupés Aug. 1♂ AMNH; Lábrea, Rio Purus Dec. 1♂ BMNH; Tefé Oct. 1♂ BMNH; *Mato Grosso*: Sinope, km 500 Cuiabá-Santarém Jul. 1♂ AME; *Pará*: Pará 1♂, 3♀ BMNH; *Rondônia*: Cacaulândia Oct. 1♂ USNM; *Not located*: no specific locality 1♂ AMNH. **FRENCH GUIANA** (2♀): no specific locality 2♀ BMNH. **COUNTRY UNKNOWN** (3♂, 1♀): Amaz. 1♀ BMNH; Amaz. S. 1♂ BMNH; Amazons 1♂ USNM; O. Amazonas, Fruhst. 1♂ BMNH.

Additional locality data: **ECUADOR**: *Napo*: Apuya Oct.; Chichicorrumi Jul.; Yarina Jul. (Willmott & Hall, sight records). **BRAZIL**: *Amazonas*: Ilha de Maracá (Mielke & Casagrande, [1992]).

Adelpha thesprotia (C. & R. Felder, 1867)

Figs. 5,6k,7,9,14,20; **90a-d**; 181a-c; *305*

Heterochroa thesprotia C. & R. Felder (1867: 419)

TL: Surinam. **OTL**: Surinam; Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **LT**♀: "Lectotype//Type//Surinam coll. Lennep//thesprotia ♀//Rothschild Bequest B.M. 1939-1//thesprotia n.//No. 86 Cocala Cr. III 242 F.G.//Heterochroa thesprotia C. & R. Felder, ♀ lectotype det. R.I. Vane-Wright 1983 - see Hall 1938: 211//Illustrated in The Butterflies of Venezuela A. Neild, 1996//99"; **PLT**♂: "Surinam Cll. Klinkenberg// thesprotia ♂//Rothschild Bequest B.M. 1939-1//Adelpha thesprotia teste Rothschild Colln. det. R.I. Vane-Wright 1983"; **PLT**♂: "Heterochroa thesprotia C. & R. Felder, ♂ paralectotype det. R.I. Vane-Wright 1983// Bogotá Lindig//Rothschild Bequest B.M. 1939-1"; **PLT**♂: "Heterochroa thesprotia C. & R. Felder, ♂ paralectotype det. R.I. Vane-Wright 1983// Bogotá Lindig//Rothschild Bequest B.M. 1939-1//Illustrated in The Butterflies of Venezuela A. Neild, 1996//97" [all examined]

=*Adelpha praetura* Fruhstorfer (1913: pl. 106f; 1915: 519)

TL: Unknown. **OTL**: [Río Demerara, British Guiana; Cayenne, Surinam; Mato Grosso; Lower Amazon]. **Types**: **BMNH**(T): **LT**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//86//delphicola praetura Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Honrath Coll. H. Fruhstorfer// TYPE//Type//Syntype"; **PLT**♀: "Fruhstorfer Coll. B.M. 1937-285//Pará// TYPE//Type"; **BMNH**(M): **PLT**♀: "Surinam ex coll. Fruhstorfer// Fruhstorfer Coll. B.M. 1937-285//Paratype"; **PLT**♀: "Guyane Française Nouveau Chantier Coll. Le Moult//Mars//praetura Fruhst.//Fruhstorfer Coll. B.M. 1933-131"; **BMNH**(R): **PLT**♀: "Río Demerara//praetura Fruhst.//24// R//umgelanst [?illeg.] in delphicola praetura Fruhst." = *A. fabricia* [all examined]

=*Adelpha nava* Fruhstorfer (1913: pl. 106f; 1915: 519) **syn. nov.**

TL: [Province of Sara, Bolivia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Prov. Sara, Dept. S. Cruz de la Sierra, end II to beg. IV 04 (J. Steinbach)//praetura nava Fruhst.//umgelanst in delphicola nava Fruhst." [examined]

=*Adelpha delphicola ophellas* Fruhstorfer (1915: 519) **syn. nov.**

TL: Espírito Santo [Brazil]; Paraguay. **Types**: **BMNH**(T): **ST**♂: "Syntype ♂ Adelpha delphicola ophellas Fruhstorfer G. Lamas det. 1987//Paraguay ex coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//TYPE//Type// Syntype"; **ST**♀: "Espírito Santo, Brasil, ex coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//TYPE//Type"; **BMNH**(M): **ST**♂: "ophellas Fruhst.// Paraguay ex Coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285"; **ST**?♂: "Espírito Santo Brasil ex Coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285" [all examined]

=*Adelpha zunilaces* Fruhstorfer (1915: 530) **syn. nov.**

TL: Iquitos [Peru]. **Types**: **ZMHU**: **HT**♂: "Iquitos Amaz. sup. 1./4. Bis 1./11.97. Michael.//Holotype//Holotype ♂ Adelpha zunilaces Fruhstorfer G. Lamas det. '87" [examined]

Adelpha thesprotia Fldr., Kirby (1871); *Adelpha delphicola delphicola* Fruhst., Hall (1938) in part, misid.; *Adelpha delphicola ophellas* Fruhst., Hayward (1951) misid.; *Adelpha delphicola* Fruhst., D'Abrera (1987) misid.

Identification, taxonomy and variation:

This species is distinguished from the similar *A. phylaca* and *A. messana delphicola* by the very pronounced inner submarginal series in comparison with the postdiscal series on the VHW, by the silvery grey submarginal dash in cell Cu_1-M_3 on the VFW being absent, or if present, much fainter and narrower than that in cell Cu_2-Cu_1, and (though this occasionally varies in *A. thesprotia*) by the predominantly dark brown ventral surface colour, particularly on the hindwing immediately distal of the white postdiscal band. *Adelpha erotia* and *A. delinita* are distinguished under their respective accounts. The large, pale spot distal of the postdiscal band on the VFW in cell Cu_2-Cu_1, consisting of the fused postdiscal series, and the large, undivided postdiscal spot in cell Cu_1-M_3, consisting of the fused postdiscal band and postdiscal series, distinguishes *A. thesprotia* from most species outside the *A. phylaca* group. Certain specimens of *A. fabricia* may be very similar, particularly females in which the postdiscal dashes on the VFW in cell Cu_2-Cu_1 are almost merged, but they can be distinguished by generally having the orange subapical spot in cell M_2-M_1 on the DFW absent or reduced compared with that in cell M_1-R_5, the VHW reddish brown immediately distal to the white postdiscal band and the second VFW discal cell bar straight instead of concave. Additional characters are given under *A. capucinus* for distinguishing that species. There is some variation in the size of the orange DFW subapical spots, the presence or absence of whitish shading in the DFW postdiscal band at the anal margin, and the ground colour of the ventral surface, which varies from deep reddish and dark brown to pale orange-brown, or a more uniform, pale reddish brown.

This is one of the most common and earlier described members of the Amazonian “orange and white banded” *Adelpha*, and consequently has been frequently misidentified in the literature. Felder & Felder (1867) described the species based on an unspecified number of male and female specimens in their collection, from Surinam (ex coll. Sylvii van Lennep and Klinkenberg) and Bogotá, the latter collected by Lindig. They compared the dorsal surface with *A. erotia*, but identification of the species would probably not be possible from their original description were it not for the presence of a number of syntypes in the BMNH. Given the confusing similarity of this taxon to many others, I designate the female specimen in the BMNH(R), with the following data, as the lectotype of *Heterochroa thesprotia*: “Lectotype//Type//Surinam coll. Lennep//thesprotia ♀//Rothschild Bequest B.M. 1939-1//thesprotia n.//No. 86 Cocala Cr. III 242 F.G.//Heterochroa thesprotia C. & R. Felder, & lectotype det. R.I. Vane-Wright 1983 - see Hall 1938: 211//Illustrated in The Butterflies of Venezuela A. Neild, 1996//99”. Although the specimen already bears a lectotype label by Vane-Wright, this designation has not been published and therefore is not valid, neither is the simple naming of the specimen as the lectotype by Neild (1996), also based on the invalid lectotype label. The entire known type series belong to the same taxon, so I base the choice of lectotype specimen on the fact that it is the specimen mentioned by Hall (1938) as the type of *thesprotia*. Unfortunately, Hall (1938) went on to apply the name *thesprotia* to *A. capucinus*, and the name *delphicola* to *A. thesprotia*, and this error has been followed by all subsequent authors until corrected by Neild (1996). Fruhstorfer (1915), equally confusingly, treated the name *thesprotia* as a subspecies of *A. melona*, and also applied the name *delphicola* to true *A. thesprotia*, recognising three new subspecies in the process. Fruhstorfer (1913) figured *praetura* based on a supposedly male specimen from Río Demerara in Guyana, but also stated (Fruhstorfer, 1915: 519) that the name was based on specimens in his collection from Cayenne, Mato Grosso and the Lower Amazon. I have examined a number of syntypes in the BMNH, and designate the specimen figured by Neild (1996), with the following label data, as the lectotype of *Adelpha praetura*: “Illustrated in The Butterflies of Venezuela A. Neild, 1996//86//delphicola praetura Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Honrath Coll. H. Fruhstorfer//TYPE//Type//Syntype”. The specimen figured by Fruhstorfer is actually a female and almost certainly represents *A. fabricia*; although it lacks the typical blue-grey scaling along the basal edge of the white DHW postdiscal band, this is also absent in the two other female specimens that I have seen of this species. Due to the slight doubt surrounding the identity of this female specimen, I have chosen as the lectotype a specimen that bears both a label written in Fruhstorfer’s hand identifying it as *praetura*, and a TYPE label, and one that conforms to previous authors’ views (Hall, 1938; Neild, 1996) on the application of the name. Since *praetura* was based on specimens from throughout the range of typical *A. thesprotia*, and the lectotype is typical of the species, Neild (1996) correctly synonymised the name with *A. thesprotia*. *Adelpha nava* was figured on plate 106f (Fruhstorfer, 1913) and later described as a subspecies of *A. delphicola* (Fruhstorfer, 1915: 519), based on specimens from Sara Province in Bolivia, collected from the end of February to the beginning of April. A syntype specimen in the BMNH(R) exactly matches the figured specimen, particularly in having the tip of the hindwing tornus missing. It differs from typical *A. thesprotia* in having a more reddish brown ventral ground colour, but as this is a variable character throughout the range I synonymise *nava* with *thesprotia* (**syn. nov.**). The only one of the three “*delphicola*” subspecies described by Fruhstorfer (1915) that might arguably be valid is *A. delphicola ophellas*, which was based on an unspecified number of specimens from Espírito Santo and Paraguay. Specimens from this region, including the several syntypes examined, typically have rather paler orange-brown ventral coloration and the DFW postdiscal band is narrowed in cell 2A-Cu_2 and whitish. However, identical pale ventral coloration also occurs occasionally in Amazonian specimens, while certain Paraguayan specimens have typically dark ventral colours, and the amount of white at the DFW anal margin is very variable. I therefore regard *ophellas* as a synonym of *thesprotia* (**syn. nov.**). Fruhstorfer (1915) described a single specimen from Staudinger’s collection, collected in Iquitos, as a new species, *A. zunilaces*, with the briefest of diagnoses. He compared the dorsal surface to *A. attica*, *A. erotia* and *A. jordani*, and the ventral surface to *A. melona deborah*. I have examined the holotype specimen in the ZMHU (Fig. 90c,d), and I believe it to represent either an aberration of *A. thesprotia*, or a hybrid between *A. thesprotia* and *A. mesentina*. The dark rays on the ventral surface, as well as the connected second and fourth discal cell bars (more pronounced on the right-hand wing, not figured), are characters unique to *A. mesentina* and *A. lycorias*, while the loss of the postdiscal and submarginal series on the ventral surface also characterises these species. However, the wing shape and overall pattern is clearly very similar to *A. thesprotia*, the red-brown line that borders the basal edge of the outer postdiscal series on the VHW being faintly visible, while the VHW discal cell bars are black. I have dissected the specimen and the male genitalia do not differ from either *A. thesprotia* or *A. lycorias*, and I therefore place *zunilaces* as a synonym of *thesprotia* (**syn nov.**).

The wing pattern, genitalia and early stages place *A. thesprotia* in the *A. phylaca* group, in which its wing pattern is perhaps most similar to *A. phylaca*, particularly the VFW discal cell bars. Although these two species are not known to be sympatric to date, I believe that there are sufficient differences in the ventral wing pattern and male genitalia (the valvae of *A. phylaca* being more pointed) to retain them as distinct. In addition, the dorsal thoracic projection on the pupa of *A. thesprotia* is more pronounced than that of *A. phylaca*, being more similar to that of *A. lycorias* and *A. mesentina*, and the possible hybrid between *A. thesprotia* and *A. mesentina* (discussed above) also suggests that *A. thesprotia* may in fact be the sister species to *A. mesentina* and *A. lycorias*.

Range: Southern Venezuela to Bolivia, throughout Brazil, Paraguay, northeastern Argentina and the Guianas. Although not recorded to date from Trinidad, it may possibly occur there.

Immature stages: Moss (1933) reared this species in Brazil (Pará), reporting several hostplants (see Appendix C) and figuring both the last instar larva (pl. I, fig. 10) and the pupa (pl. II, fig. 5). Although he identified it as "*A. delphicola*", his voucher specimens in the BMNH show it to be this species. The figure shows a larva typical of the *A. phylaca* group, which has a pale brown ground colour and is dark brown laterally on the thoracic segments to A2, with a dark brown oblique dash on each of segments A4 and A5. Scoli are well developed on T2, T3, and the abdominal segments (Fig. 5,6k). The head capsule has short medial and posterior chalazae and is notable for being clothed with numerous short, dense setae (Fig. 9). The pupa (Fig. 14,20) has small, leaf-shaped, laterally pointing head horns, a large, blunt dorsal projection on R2, and a very pronounced, dorsal "hook" on A2 which broadens at its tip. This hook is typical of the *A. phylaca* group.

The larvae feed both relatively high (more than 3m) above the ground on low branches, or occasionally on small saplings within 1-2m of the ground. Later instars rest on the top of a leaf in the Front-Arched-Rear-Up position, and may pupate on the hostplant.

Habitat and adult ecology: This species occurs in lowland rain forest from sea level to around 1200m, where it is not uncommon in both primary and disturbed habitats. In eastern Ecuador, the species is widespread and I have found males to be attracted to traps baited with rotting fish in large forest light gaps and tree falls. It is present throughout the year, but most common in the wet season and early dry season.

Specimens examined: 222 (192♂, 30♀)

"**MEXICO**" (2♂): *Chiapas*: Ocozingo Jun. 1♂ AME-error; *Not located*: no specific locality 1♂ BMNH-error. **VENEZUELA** (4♂): *Amazonas*: Cerro de La Neblina 140m Mar. 1♂ USNM; Raudal Guaharibos, Alto Orinoco Aug. 1♂ USNM; Tobogán de la Selva, nr. Puerto Ayacucho 100m Mar. 1♂ AFEN; *Not located*: no specific locality 1♂ AFEN. **COLOMBIA** (13♂, 2♀): *Amazonas*: Florida May 1♂ BMNH; Leticia 1♂ USNM; Tacana km 11 150m Jan. 1♂ MHNUC; *Caquetá*: Río Bodoquero Jan. 1♂ USNM; Río Orteguaza Jan. 1♂ USNM; *Cundinamarca*: Bogotá 2♂ BMNH; *Meta*: Remolinos 1♀ JFL; *Putumayo*: Umbría 2♂ AMNH; *Vaupés*: Mitú Jun. 1♂ USNM; *Not located*: no specific locality 1♂ ZMHU, 1♂(error), 1♀ MCZ, 1♂ AMNH. **ECUADOR** (15♂): *Morona-Santiago*: Bomboiza Jul. 1♂ KWJH; *Napo*: Apuya Feb. Aug. Oct. 3♂ KWJH, 1♂ DAT; Chichicorrumi Jul. 1♂ KWJH; Coca-Loreto rd., km 21, 300m Mar. 1♂ KWJH; Río Coca Jun. 1♂ AME; Río Tiputini 300m Mar. 1♂ KWJH; Satzayacu Apr. 1♂ KWJH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Jan. Aug. 2♂ PJD; Limoncocha Dec. 1♂ USNM; *Tungurahua*: Río Negro 800m Jun. 1♂ AME; *Not located*: Oriente 1♂ AMNH. **PERU** (59♂, 2♀): *Amazonas*: Río Santiago Oct. 1♂ AMNH; *Cuzco*: Marcapata 1♂ BMNH; *Junín*: Chanchamayo 1♂ BMNH, 4♂ ZMHU, 2♂ BMB; La Merced 2500' Jun. 1♂ BMNH, 1♂ BMB, 1♂ MCZ; Satipo May Dec. 4♂ AMNH, 3♂ AME; *Loreto*: Caballo Cocha 1♂ BMNH; Castaña 150m Oct. 1♂ MUSM; Iquitos Mar. Jul. Aug. Nov. 4♂, 1♀ BMNH, 5♂ ZMHU, 2♂ MUSM, 2♂ AMNH; Mishana, Río Nanay 150m Feb. 1♂ MUSM; Pebas 2♂, 1♀ BMNH, 1♂ ZMHU, 1♂ MCZ; Río Sucusari 140m Sep. 1♂ MUSM; *Madre de Dios*: Boca Río La Torre 300m May Nov. 2♂ MUSM; Pakitza 340-400m May Sep. Oct. 3♂ MUSM; Puerto Maldonado, 30 km S.W., Oct. 1♂ USNM; Shintuya 460m Jul. 1♂ AME; *Puno*: Chaquimayo 3000' Jun. Jul. 1♂ BMNH; Yahuarmayo Mar. Apr. 1♂ BMNH; *San Martín*: Achinamiza Nov. 1♂ AMNH; Jepelacio 4♂ AMNH; Tarapoto 1♂ BMNH, 1♂ BMB; *Not located*: Río Huallaga 2♂ AMNH; upper Río Marañón Jan. 1♂ AMNH; middle Río Ucayali Apr. 1♂ AMNH. **BOLIVIA** (14♂): *La Paz*: Farinas 1♂ BMB; 20 mi. above Mapiri 4000' 1♂ BMNH; Río Songo 1200m 5♂ ZMHU, 1♂ MCZ; *Santa Cruz*: Prov. Sara Feb. Apr. 5♂ BMNH; *Not located*: no specific locality 1♂ MCZ. **BRAZIL** (48♂, 13♀): *Amazonas*: Benjamin Constant Oct. 5♂ AMNH; Fonte Boa Jul. 2♂ BMNH; Humaitá Jul.-Sep. 1♂ BMNH; lower Rio Madeira Jul.-Sep. 1♂ BMNH; Manaus 1♂ BMNH; Rio Caiary-Vaupés Aug. 5♂ AMNH; São Paulo de Olivença 2♂ BMNH; Tefé 2♂ BMNH, 1♂ MCZ; Thamar, Rio Negro 1♂ ZMHU; *Bahia*: Bahia 1♂ BMNH; *Espírito Santo*: no specific locality 1♂, 1♀ BMNH; *Mato Grosso*: Buriti May 4♂ USNM; Chapada Apr. 2♂ BMNH; Cuyabá 1♂ BMNH; no specific locality 3♂ BMNH; *Minas Gerais*: Leopoldina 1♀ ZMHU; Nova Lima Aug. 1♂ AME; *Pará*: Óbidos 1♂ AMNH; Pará 4♂, 6♀ BMNH; Rio Amazon bet. Pará & Manaus Feb. 2♀ AMNH; *Paraná*: Iguaçu 1♂ BMNH; no specific locality 1♂ AMNH; *Rondônia*: Cacaulândia Oct. 1♂ USNM; *Rio de Janeiro*: Itabapoana 1♂ BMNH; Porto Velho de San Antonio 1♂ USNM; Rio de Janeiro 1♂, 3♀ BMNH, 1♂ ZMHU; *Santa Catharina*: Rio do Sul Feb. 1♂ AME; *Not located*: Brasilia Feb. 1♂ AMNH. **PARAGUAY** (20♂, 2♀): *Caazapá*: Buena Vista Feb. 1♂ MCZ; *Central*: Asunción 1♂ MNHN; *Paraguarí*: Sapucay Sep. Nov. Dec. 4♂, 2♀ BMNH; *Not located*: Central Paraguay 5♂ BMNH; no specific locality Nov. 6♂ BMNH, 2♂ BMB, 1♂ JFL. **ARGENTINA** (2♂): *Misiones*: no specific locality Apr. 2♂ BMNH. **GUYANA** (1♀): *Not located*: Río Demerara 1♀ BMNH. **FRENCH GUIANA** (4♂, 6♀): *Cayenne*: Cayenne 1♀ BMNH, 1♀ ZMHU, 1♂, 1♀ MNHN, 1♀ USNM; *Laurent du Maroni*: St. Jean du Maroni 1♂ BMNH; Nouveau Chantier 1♀ BMNH; *Not located*: no specific locality 1♂, 1♀ BMNH, 1♂ MNHN. **SURINAM** (1♂, 2♀): no specific locality 1♂, 2♀ BMNH. **COUNTRY UNKNOWN** (10♂, 2♀): Amazon 1♂ BMNH; Amazonas 1♂ USNM; Am. Mer. 1♂ MNHN; Ob. Amazon 1♂ BMNH; no specific locality 1♂, 2♀ BMNH, 1♂ AME, 1♂ MNHN, 1♂ MCZ, 1♂ USNM, 1♂ AMNH.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Bomboiza Nov.; *Napo*: Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Sep.; Finca San Carlo Aug.; Pimpilala Sep.; Río Tiputini Sep.; Tiguino Oct.; Tiputini Biodiversity Station 300m Aug.; Yarina Jul.; Yasuní Jul. Aug. (Willmott & Hall, sight records).

Adelpha mesentina (Cramer, 1777)

Figs. 2g-j,q; **91a-d**; 182a,b; 259a,b; *306*

Papilio mesentina Cramer (1777: 102, pl. 162, figs. B, C)

TL: Surinam. **Types**: **Collection unknown**: **ST**♂: [not located, original illustration examined]

=*Adelpha mesentina* var. *chancha* Staudinger (1886: 144) **syn. nov.**

TL: Chanchamayo [Peru]. **Types**: **ZMHU**: **ST**♂: "Chancha Stgr.//Chanchamayo Thamm//Origin//Syntype" [examined]

Adelpha mesentina Cram., Hübner ([1819]), Kirby (1871); *Nymphalis mesenteria* [sic] Cram., Godart ([1824]); *Heterochroa mesenteria* [sic] Cram., Westwood (1850); *Adelpha mesentina chancha* Stdgr., Fruhstorfer (1915)

Identification, taxonomy and variation:

This species is easily distinguished from all others by the vertical orange DFW band and subapical spots, the predominantly brown ventral surface with darker rays parallel to the veins bisecting each cell, and by the second and fourth discal cell bars on the VFW being joined in the middle to isolate two whitish spots. I have examined a single aberrant specimen of *A. lycorias melanthe* with orange DFW subapical spots, which is similar to certain forms of *A. mesentina*, but this has the yellowish ventral surface typical of that taxon. *Adelpha mesentina* is dimorphic in the eastern foothills of the Andes, with one form having the orange DFW postdiscal marking extending from the anal margin to the costa approximately vertically (Fig. 91a,b), while the other has the area normally occupied by the white DFW postdiscal band in cells 2A-Cu$_2$ and Cu$_2$-Cu$_1$ dark brown, with the orange of the outer postdiscal series typically extending distally to the inner submarginal series, creating an oblique orange band on the DFW (Fig. 91c,d). I have collected series of both of these phenotypes at Bomboiza, in eastern Ecuador, at 850m, and while the form with the oblique band is more common, the form with the vertical band also occurs. There are no intermediate specimens in which only part of cells 2A-Cu$_2$ and Cu$_2$-Cu$_1$ are dark brown, suggesting that presence or absence of orange over the postdiscal band area may be controlled by different alleles at a single locus. This dimorphism in the extent of orange over the area of the postdiscal band in cells 2A-Cu$_2$ and Cu$_2$-Cu$_1$ is exactly the same as occurs in *A. erotia*, in the forms "erotia" and "lerna", only in that case the DFW postdiscal band is white in cells 2A-Cu$_2$ and Cu$_2$-Cu$_1$, and the orange scaling in the "erotia" form merely covers the white area. This clear example of dimorphism in *A. mesentina* is good evidence that the two phenotypes of *A. erotia* really are conspecific. In areas where the oblique-banded form occurs, vertically-banded specimens may also have the orange in cell Cu_2-Cu_1 on the DFW extending to the inner submarginal series. I have also seen a single specimen of the oblique banded form from La Merced in Peru, in the BMNH, that lacks the orange DFW subapical spots. Some specimens from the lower Amazon (Pará) and one female from eastern Brazil (Montes Aureos) have traces of whitish or pale orange scaling respectively over the DHW postdiscal band, but this is a variable character.

Cramer (1777) clearly figured both surfaces of this species based on an apparently male specimen from Surinam, from the collection of Mr. le Ministre E. F. Alberti. Although no syntype specimen or specimens have been located in either the RMNH or BMNH (Vane-Wright, 1975; G. Lamas, pers. comm.; pers. obs.), the taxon is so distinct that there is no doubt as to its identity and a neotype designation is unnecessary. Staudinger (1886) described *chancha* as a variety of *A. mesentina* based on an unspecified number of specimens from Chanchamayo, and a syntype is in the ZMHU. It corresponds to the oblique banded form of the species discussed above, and since I have been unable to find any consistent differences between western Amazonian and Guianan specimens of this species that merit subspecific recognition, I synonymise the name with *A. mesentina* (**syn. nov.**).

Despite the divergent wing pattern, this species and *A. lycorias* have densely packed, pale whitish scales along the base of vein Rs on the DHW that place them within the *A. phylaca* group. With the members of that group they also share similar genitalia, the male having pronounced dorsal and ventral medial lobes on the valvae, a broad clunicula and a relatively long saccus, while the sclerotised bands on the corpus bursae of the female are widely spaced. Certain wing pattern elements, such as the fused postdiscal series in cell Cu_2-Cu_1 on the VFW, which are fused to the postdiscal band in cell Cu_1-M_3, and the early stages, with the pupa having a prominent, hooked dorsal projection, confirm the placement in the *A. phylaca* group. The rounded hindwing shape, almost obsolete VHW postdiscal and submarginal series, lack of a white postdiscal band on the DHW and DFW in cells 2A-Cu_2 and Cu_2-Cu_1, dark rays in the middle of each cell on the ventral surface and joined second and fourth discal cell bars are all local or universal synapomorphies indicating that *A. mesentina* and *A. lycorias* are sister species. The holotype of *Adelpha zunilaces*, discussed under *A. thesprotia*, might represent a hybrid between that species and *A. mesentina*, suggesting that that species might the sister species to *A. mesentina*/*lycorias*.

Range: East of the Andes from southern Venezuela to Bolivia, throughout Amazonian Brazil and the Guianas. There are also several records from Mato Grosso and Paraguay, in the drainage of the Río Paraguay.

Immature stages: Moss (1933) reared this species in Brazil (Pará), and figured both the last instar larva (pl. I, figs. 11, 12) and the pupa (pl. II, fig. 6). The larva is very similar to *A. thesprotia* (see description under that species), except that it only has a single brown oblique lateral dash on segment A5. The pupa is apparently almost indistinguishable from *A. thesprotia* (Moss, 1933). Moss' figure of the larva shows it resting in the Front-Arched-Rear-Up position.

Habitat and adult ecology: This is a common and widespread species in lowland rain forest habitats, where it occurs from sea level up to 1300m, possibly to 1500m, in the foothills of the eastern Andes. I have found it to be present throughout the year in a variety of sites in eastern Ecuador, in both flat and hilly terrain, on ridge tops and along rivers, in primary and heavily disturbed forest. Males are readily attracted to traps baited with rotting fish, and occasionally rotting banana, in forest light gaps. They will also puddle along sandy roads through forest. I once observed a single male perching in the canopy in a large hill top light gap, around 10m above the ground. While females appear to be common in the Guianas and lower Amazon, in the western Amazon they are much less frequently encountered, the single female that I have seen was flying in a tree fall light gap in primary forest. Along the eastern slopes of the Andes from 800-1300m, from the Río Upano valley in southern Ecuador to Bolivia, occurs a form of this species with an oblique orange DFW band. This form is sympatric with the typical Amazonian form, at least at lower elevations. The oblique banded form is almost certainly maintained through mimicry with a number of *Adelpha* species with similar dorsal wing patterns, which occur exclusively in similar Andean foothill habitats, including *A. boreas*, *A. zina irma*, *A. irmina* and *A. salmoneus*. It is worth noting that Pinheiro (1996) found this species to be palatable to kingbirds in Brazil.

Specimens examined: 411 (367♂, 44♀) † - form *chancha*; ‡ - orange in DFW cell Cu_2-Cu_1 extends to inner submarginal series.

VENEZUELA (4♂): *Amazonas*: Gavilán, 35 km S.E. Puerto Ayacucho 100m Mar. 2♂ AFEN; *Bolívar*: La Vuelta, Caura R. May 1♂ BMNH; Maripa 1♂ BMNH. **COLOMBIA** (29♂, 5♀): *Amazonas*: Caño Yaguacaca Jan. 1♂ MHNUC; El Tacana, 10 km de Leticia Dec. 1♂ MHNUC; La Pedrera, Río Caquetá 1♂ LMC; Leticia 1♂ ESM, 1♀ USNM; Puerto Nariño Dec. 2♂ LMC; "*Antioquia*": Puerto Berrío May-Aug. 1♂ BMB-error; *Cundinamarca*: Bogotá 8♂ BMNH; env. de Bogotá 2♂ BMNH; *Meta*: San José Guaviare Apr. Jun. 1♂, 1♀ JFL; San Martín, Llanos of Río Meta 1♀ BMNH; Villavicencio Jan. Feb. Dec. 1♂ ESM, 1♂ MCZ, 1♀ BMNH, 3♂ AME; *Putumayo*: Florida 1♂ ZMHU; Orito Nov. 1♀ LMC; *Vaupés*: Mitú Dec. 2♂ JFL; *Not located*: no specific locality 2♂ BMNH, 1♂ ZMHU. **ECUADOR** (41♂, 5♀): *Morona-Santiago*: Bomboiza Nov. 9♂(7†) KWJH, 1♂† DAT; Mangosiza 1♂ BMNH; Méndez-Santiago rd., km 40, Oct. 3♂ MJP; *Napo*: Apuya 600m Jul. Oct. 1♂ KWJH, 1♂ DAT; Archidona Apr. 2♂ BMNH; Chichicorrumi 450m Sep. 1♂, 1♀ KWJH; Coca May-Jul. 1♂ BMNH; Coca, 30 km S.W., Apr. 1♂ MJP; Las Minas de Misahuallí 400m Jul. 1♂ KWJH; Misahuallí Apr. 1♂ AME; Río Coca Jun. 2♂, 1♀ AME; Río Napo 1♂ BMNH, 3♂, 1♀ MNHN; Satzayacu Sep. 1♂ DAT; *Pastaza*: Canelos 1♂ BMNH; Rotuno 1♂ BMNH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Jan. Feb. May-Jul. Oct. 5♂, 2♀ PJD; Limoncocha Sep. 1♂ FSCA; *Zamora-Chinchipe*: Layaico 1000m Nov. 1♂† AME; Zamora 3-4000' 1♂† BMNH; *Not located*: no specific locality 1♂ BMNH. **PERU** (171♂, 3♀): *Ayacucho*: Candalosa 1300m Jun. 1♂† AME; *Huánuco*: Cord. del Sira 800m Aug. Sep. 1♂ MUSM; Puerto Inca 2♂ MUSM; Río Pachitea 4♂(1†) ZMHU, 1♂ AME; Tingo María Apr.-Aug. Nov. 2♂ FSCA, 16♂ AME, 1♂ USNM; Tournavista 2♂ AME; *Junín*: Chanchamayo 5♂(3‡) BMNH, 1♂ AME, 1♂ USNM, 1♂ BMB; Chanchamayo 1500m 4♂† BMNH, 4♂† ZMHU, 1♂† BMB; La Merced 2500' Jan.-Sep. 15♂(10†) BMNH, 8♂(1†) BMB; Río Colorado, 2000' Mar. Apr. 2♂† BMNH; Río Perené 2000' Jul. Aug. 2♂† BMNH, 1♂‡ BMB; Río Utcumayo 1000m Apr. 1♀ USNM; San Luis de Shuaro Aug. 3♂ MUSM; Satipo Oct. Dec. 9♂(6†) AME; *Loreto*: Castaña 150m Oct. 1♂ MUSM; Caballococha 2♂ BMNH; Iquitos Jul.-Sep. 9♂ BMNH, 1♂ ZMHU, 1♂ FSCA, 1♂ USNM; Nauta 1♂ BMNH; Negro-Urcu, Río Napo Oct. 1♂ MUSM; Pebas Dec.-Jan. 6♂(1†) BMNH, 1♂ ZMHU; Río Cachiyacu 4♂ BMNH; "Río Negro" [=Río Huallaga] 3♂ BMNH; Río Pacaya Aug. Sep. 1♂ BMNH; Río Sucusari 140m Sep. 1♂ MUSM; Sarayacu 1♂ ZMHU; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Albergue Amazonia 600m Oct. 1♂ MUSM; Boca Río La Torre 300m Jul. Sep. Nov. 4♂, 1♀ MUSM; Pakitza 340-400m Oct. Nov. 7♂ MUSM; Puerto Maldonado 4♂ AME; Río Las Piedras Aug. 2♂ MUSM; Río Tambopata 230m Aug. 1♀ MUSM; *Pasco*: Chuchurras 1♂ MUSM; Pichis rd. 1♂ BMB; Pozuzo 900m 5♂ BMNH; *Puno*: Chaquimayo Aug.-Oct. 1♂ BMNH; La Unión 2000' Nov. Dec. 7♂ BMNH; *San Martín*: Juanjuí 1♂ USNM; Moyobamba 1♂ BMNH; *Ucayali*: Pucallpa May 2♂ AME; *Not located*: Huallaga 1♂‡ BMNH; Marañón 1♂ BMNH; N.E. Peru Oct. 1♂ BMNH; Río Marañón 1♂ BMNH; Río Ucayali 3♂ BMNH; no specific locality 1♂ AME, 1♂ USNM, 1♂ MUSM, 1♂ MCZ, 1♂† BMNH;. **BOLIVIA** (16♂, 2♀): *Cochabamba*: San Mateo 2♂ BMNH; *El Beni*: Cachuela Esperanza Sep. 1♂ AME; *La Paz*: Caranavi 700m Sep. 1♂ KWJH; Chimate 1♂† BMNH; Guanay 1500' Aug. 1♂ BMNH; Muachay, Beni R. Aug. 1♂ BMNH; Río Songo 1200m 1♂ ZMHU; *Pando*: Río Manuripe 1♂ MNHN; *Santa Cruz*: Prov. Sara Feb. Apr. May 2♂, 1♀ BMNH; Río Juntas 300m 1♀ ZMHU; *Not located*: no specific locality 1♂

BMNH, 1♂ USNM, 3♂ MCZ. **BRAZIL** (81♂, 12♀): *Acre*: Alto Juruá 1♂ AME; *Amazonas*: Ega 3♂ BMNH, 2♂ BMB; Fonte Boa Jul. Aug. 4♂ BMNH; Humaitá Jul.-Sep. 2♂ BMNH; lower Marmelos Aug. 1♂ BMNH; L. Rio Madeira Jul.-Sep. 2♂ BMNH, 1♂ BMB; Manicoré Aug. 1♂ ZMHU, 2♂ AME; Rio Caiary-Vaupés Sep. 1♂ USNM; São Paulo de Olivença June-Sep. 10♂ BMNH, 1♂ ZMHU, 2♂ AME, 1♂ BMB; Tabatinga 1♂ BMNH; Tefé Jan. Apr. Oct. Nov. 5♂ BMNH, 4♂ MCZ, 1♂ AME; no specific locality 1♂ BMNH; *Maranhão*: Montes Aureos 1♀ BMNH; *Mato Grosso*: Cuiabá-Corumbá 2♂ BMNH; no specific locality 4♂ BMNH, 1♂ BMB; *Pará*: Óbidos Sep. 1♂ ZMHU, 2♂ USNM; Pará 3♂, 8♀ BMNH, 1♂, 1♀ MCZ; Santarém 1♀ BMNH; *Pernambuco*: Pernambuco 1♂ MCZ; *Rondônia*: Ariquemes Nov. 7♂ AME; Cacaulândia 160-350m Mar. Oct. 1♂, 1♀ FSCA, 2♂ USNM; Calama, Rio Madeira 1♂ BMNH; Jaru Mar. 1♂ AME; Porto Velho 1♂ USNM; *Not located*: Brasilia 1♂ MCZ; Santa Cruz 1♂ BMNH; no specific locality 3♂ BMNH, 2♂ BMB. **PARAGUAY** (2♂): *Not located*: Santa Cruz U. Paraguay R. Dec. 1♂ BMNH; no specific locality 1♂ BMNH. **GUYANA** (1♂, 3♀): *Barima/Waini*: Mabaruma Dec. Jan. 1♂ BMB; *Potaro/Siparuni*: Potaro River 1♀ AME; *Upper Takutu/Upper Essequibo*: Annai, Essequibo 1♀ BMNH; *Not located*: no specific locality 1♀ AME. **FRENCH GUIANA** (5♂, 11♀): *Cayenne*: Cayenne 1♂, 2♀ BMNH, 1♀ ZMHU, 1♀ USNM, 1♀ MCZ; *Laurent du Maroni*: Bas Maroni 1♀ AME; St. Jean du Maroni 2♂ BMNH, 1♂ USNM; St. Laurent du Maroni 2♀ BMNH; *Not located*: no specific locality 1♂, 3♀ BMNH. **SURINAM** (1♀): no specific locality 1♀ BMNH. **COUNTRY UNKNOWN** (17♂, 2♀): no specific locality 2♂, 2♀ BMNH, 3♂ USNM, 3♂ BMB, 4♂ MCZ, 1♂† AME; Amazons 3♂ USNM; Santa Cruz-Tapirapuan Sep. 1♂ BMNH.

Additional locality data: **VENEZUELA**: *Bolívar*: rd. to Icabarú (A. Neild, pers. comm.). **ECUADOR**: *Morona-Santiago*: Bomboiza May; Santiago Sep.; Taisha Jun.; *Napo*: Apuya Feb. Apr. Aug.-Dec.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Jul. Dec.; Coca-Loreto rd., km 21, Mar.; Finca San Carlo Aug. Sep. Dec.; Pimpilala Sep.; Río Tiputini Mar. June. Sep.; Tiguino Oct.; Tiputini Biodiversity Station 300m Aug.; Yarina Jul.; Yasuní Jul. Aug.; *Pastaza*: Lorocachi 200m Jul.; Pitirishca Jul. 1000m; Shell Feb. Oct.; *Sucumbíos*: Pañacocha Oct. (Willmott & Hall, sight records).

Sep. 1♂ ZMHU, 2♂ USNM; Pará 3♂, 8♀ BMNH, 1♂, 1♀ MCZ; Santarém 1♀ BMNH; *Pernambuco*: Pernambuco 1♂ MCZ; *Rondônia*: Ariquemes Nov. 7♂ AME; Cacaulândia 160-350m Mar. Oct. 1♂, 1♀ FSCA, 2♂ USNM; Calama, Rio Madeira 1♂ BMNH; Jaru Mar. 1♂ AME; Porto Velho 1♂ USNM; *Not located*: Brasilia 1♂ MCZ; Santa Cruz 1♂ BMNH; no specific locality 3♂ BMNH, 2♂ BMB. **PARAGUAY** (2♂): *Not located*: Santa Cruz U. Paraguay R. Dec. 1♂ BMNH; no specific locality 1♂ BMNH. **GUYANA** (1♂, 3♀): *Barima/Waini*: Mabaruma Dec. Jan. 1♂ BMB; *Potaro/Siparuni*: Potaro River 1♀ AME; *Upper Takutu/Upper Essequibo*: Annai, Essequibo 1♀ BMNH; *Not located*: no specific locality 1♀ AME. **FRENCH GUIANA** (5♂, 11♀): *Cayenne*: Cayenne 1♂, 2♀ BMNH, 1♀ ZMHU, 1♀ USNM, 1♀ MCZ; *Laurent du Maroni*: Bas Maroni 1♀ AME; St. Jean du Maroni 2♂ BMNH, 1♂ USNM; St. Laurent du Maroni 2♀ BMNH; *Not located*: no specific locality 1♂, 3♀ BMNH. **SURINAM** (1♀): no specific locality 1♀ BMNH. **COUNTRY UNKNOWN** (17♂, 2♀): no specific locality 2♂, 2♀ BMNH, 3♂ USNM, 3♂ BMB, 4♂ MCZ, 1♂† AME; Amazons 3♂ USNM; Santa Cruz-Tapirapuan Sep. 1♂ BMNH.

Additional locality data: **VENEZUELA**: *Bolívar*: rd. to Icabarú (A. Neild, pers. comm.). **ECUADOR**: *Morona-Santiago*: Bomboiza May; Santiago Sep.; Taisha Jun.; *Napo*: Apuya Feb. Apr. Aug.-Dec.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Jul. Dec.; Coca-Loreto rd., km 21, Mar.; Finca San Carlo Aug. Sep. Dec.; Pimpilala Sep.; Río Tiputini Mar. June. Sep.; Tiguino Oct.; Tiputini Biodiversity Station 300m Aug.; Yarina Jul.; Yasuní Jul. Aug.; *Pastaza*: Lorocachi 200m Jul.; Pitirishca Jul. 1000m; Shell Feb. Oct.; *Sucumbíos*: Pañacocha Oct. (Willmott & Hall, sight records).

Adelpha lycorias (Godart, [1824])

Figs. **92**; 183; 260; *306*

Identification, taxonomy and variation:

This species is distinguished from all similar species by the predominantly brown ventral surface with darker rays parallel to the veins bisecting each cell, and by the second and fourth discal cell bars on the VFW being joined in the middle to isolate two whitish spots. There is geographic variation in the width and colour of the oblique DFW postdiscal band, which may be pinkish red, white, orange or pale orange, and in the presence or absence of white subapical spots on the DFW and submarginal lines on the DHW. Forms of one subspecies have extensive red scaling in the base of the DFW discal cell and cell 2A-Cu$_2$. Six subspecies are recognised.

This species, as treated here, comprises several taxa that have traditionally been regarded as distinct species, on the basis of superficial wing pattern differences, while Fruhstorfer (1915) even separated several into different species groups on the basis of a character of wing venation. The latter character proves to be very variable in the species, and the majority of the taxa are known to be connected by intergrade specimens from localities at the edges of the ranges of pairs of subspecies; since there are no differences in the male genitalia, or in wing pattern characters that do not vary intraspecifically elsewhere in the genus, I regard all of these taxa as conspecific. However, I stress that this arrangement is a taxonomic hypothesis that requires testing in the field. Biogeographically, Colombia is the key to understanding the relationships between the constituent taxa of *A. lycorias*, but it is also an area in which many locality data are inaccurate or unreliable. In my opinion, there is little evidence to suggest that any *A. lycorias* taxa are sympatric in Colombia, but there are nevertheless a handful of specimens with locality data that seem to refute this. For the present, I have regarded these as labelling errors, based on the observation that in each area a single taxon occurs either exclusively, or is so overwhelmingly more common as to cast doubt on the validity of single specimens of other taxa labelled as from that area. All taxa of this species are common in collections and there is little reason to suppose that abundance might change significantly from one region to the next. If all label data were treated as reliable, four distinct species would be recognised within Colombia, all of which undergo apparent hybridisation with one another. I prefer to group these largely or completely allopatric taxa for the present, and encourage anyone who is able to demonstrate sympatry of phenotypes to publish their findings.

Adelpha lycorias is the sister species to *A. mesentina*, and, as discussed under that species, despite their atypical appearance both belong in the *A. phylaca* group.

Range and status: Mexico to western Ecuador, throughout Colombia in montane areas, northern Venezuela to northeastern Argentina in the foothills of the eastern Andes, Trinidad, Paraguay, southeastern Brazil and northwestern Argentina. Common in association with mountainous areas from sea level to 2600m.

Specimens examined: 1208 (1050♂, 158♀)

Adelpha lycorias lycorias (Godart, [1824])

Figs. **92a-d**; 260a-c; *306*

Nymphalis lycorias Godart ([1824]: 342, 405)

TL: Brazil. **Types**: **MNHN**?: **HT**♂: [not located]

=*Papilio isis* Drury (1782: 8, pl. 7, figs. 1, 2) preocc. (Drury, 1773)

TL: Rio Janeiro, Brazil. **Types**: **Collection unknown**: **ST**: [not located, original illustration examined]

=*Adelpha isis divina* Fruhstorfer (1907: 171) **stat. nov.**

TL: Espírito Santo [Brazil]. **Types**: **BMNH**(T): **ST**♀: "Syntype ♀ Adelpha isis divina Fruhstorfer G. Lamas det. 1987//Fruhstorfer Coll. B.M. 1937-285//TYPE//Espírito Santo Brasil ex coll. Fruhstorfer//Type// Syntype"; **BMNH**(M): **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//Espírito Santo Brasil ex coll. Fruhstorfer"; **ST**♀: "isis divina Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Espírito Santo Brasil ex coll. Fruhstorfer" [all examined]

=*Adelpha isis pseudagrias* Fruhstorfer (1908: 8) (also 1909a: 40) **syn. nov.**

TL: Santa Catharina [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1933-131//isis pseudagrias Fruhst.//Brasilien Blumenau Fruhstorfer// TYPE//Type//Syntype" [examined]

=*Heterochroa isis* Drury, Westwood (1850); =*Adelpha isis* Drury, Kirby (1871), Fruhstorfer (1915), Hayward (1951), Hall (1938), D'Abrera (1987); *Adelpha lycorias* Godt., Kochalka *et al*. (1996), Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. l. lara* by the basal areas of the ventral surface lacking yellowish brown shading, by there being no whitish grey scaling in the VFW discal cell, by having some red markings in the DFW discal cell and by having the inner submarginal series and outer postdiscal series visible in the posterior half of the DHW as diffuse, whitish scaling. There is substantial variation in the amount of red on the DFW, some of it clinal, some of it individual (Fig. 92a-d). Specimens from more northerly localities typically have more extensive red, especially females (Fig. 92d). In some specimens from southerly localities the only red in the DFW discal cell is a small spot in the anterior half between cell bars two and four (Fig. 92a). The whitish DFW subapical marking and DHW submarginal bands are also variable in size, and the former may be absent.

This taxon was first described by Drury (1782) under the name *Papilio isis*, based on a specimen which he had received from "Rio Janeiro in the Brazils". The description and figures of the dorsal and ventral surface are accurate and depict a specimen, probably female, with red extending throughout the DFW discal cell and almost extending posteriorly to vein Cu$_2$. Godart ([1824]) described *Nymphalis lycorias* in detail, based on a single male specimen from Brazil, specifically mentioning the whitish DFW subapical marking and the two whitish DHW submarginal bands that occur only in this taxon. The description also refers to four red, unequal marks on the forewing dorsal surface near the base of the costa, particularly characteristic of specimens from Rio de Janeiro, where the holotype specimen probably originated. Since Godart was also aware of Drury's description (Godart, [1824]: 421), it is unclear why he described the taxon a second time, except that the taxon is rather variable. All subsequent authors regarded *lycorias* as a junior synonym of *isis*, and used the latter name to refer to this taxon, but unfortunately the name *Papilio isis* had already been described, also by Drury, in 1773 for an African lycaenid species. Therefore *Papilio isis* Drury, 1782, is a junior homonym of *Papilio isis* Drury, 1773. This fact remained unnoticed for over two centuries after the description of the name, during which time all authors referred to this taxon as *isis*, until Neild (1996), acting on the advice of Gerardo Lamas, correctly reinstated and used the next most senior name, *lycorias*. Kochalka *et al*. (1996) also used the name *A. lycorias* several months previously, but gave no explanation. Fruhstorfer (1907) described *A. isis divina* based on three females from Espírito Santo in his collection, and all are now in the BMNH (Fig. 92d). The description refers to the large red area basal of the DFW postdiscal band filling the discal cell and basal third of cell 2A-Cu$_2$, a character typically most pronounced in females from this region. However, since this character is very variable and clinal, with some forms even from Espírito Santo approaching typical southern females, I follow Hall (1938), who regarded the name as probably representing an individual form of "*A. isis*", and synonymise *divina* with *A. l. lycorias* (**stat. nov.**). *Adelpha isis pseudagrias* was described from an unspecified number of males and females from Santa Catharina (Fruhstorfer, 1908), and a syntype male is in the BMNH (Fig. 92a,b), closely corresponding to Fruhstorfer's description. However, this specimen represents the end of clinal variation in reduction of the red area basal to the postdiscal band on the DFW, and I therefore regard *pseudagrias* as a synonym of *A. l. lycorias* (**syn. nov.**). It should also be noted that Fruhstorfer's description of *pseudagrias* reappeared one year later in identical form in the same journal, but as this is clearly due to a printer's error, I do not regard the descriptions as valid. The name panthalis, listed by Martín *et al*. ([1923]) as a subspecies of *A. isis*, is a *nomen nudum*.

Range: Espírito Santo to Rio Grande do Sul in southeastern Brazil, westwards into Paraguay and northeastern Argentina. Probably also extending into Uruguay.

Immature stages: Müller (1886) described in detail the early stages of this subspecies in southeastern Brazil. The eggs are typical of the genus and are laid singly on the upperside of the leaf at the tip. The first instar is greenish brown with only faint whitish warts marking future scoli. The second instar is blackish brown with a white subspiracular line, and the scoli begin to develop, with relative sizes as in later instars. The third instar is similar to the second, while in the fourth the scoli are further advanced and the lateral area of segments A2-A7 is crossed by diagonal, anteriorly descending pale lines. The final instar has a light brown head, a reddish grey body and dark lateral colouring from T1 to A2, with two anteriorly descending black stripes on segments A4 and A5. The scoli on segments T2 and T3 are strongly inclined anteriorly, those of A2 are posteriorly inclined, and those on A2 have a swollen base. Müller's illustration (Taf. 3, fig. 5) shows a larva very similar in pattern and morphology to all other known fifth instars of the *A. phylaca* group. The pupa (Müller, 1886: Taf. 4, fig. 8) apparently turns away from light, and is typical of the species group, having a pronounced dorsal hook on T2. The head horns are small and point laterally, and the colour is a mixture of light and dark brown, with gold areas on T3 and A1, and some gold colouring on T1 and T2. There is a preserved pupa in the BMNH(R). The development times of the various stages are as follows: 1st instar, 5 days; 2nd instar, 6 days; 3rd instar, 4 days; 4th instar, 5 days; 5th instar, 9 days; pupa, 13 days.

The first four instars extend the leaf midrib or veins with frass, and in addition, the second to fourth instars accumulate a pile of frass and leaf material on the upperside of the leaf near the base. The larva rests on or beside this pile in a spiral or circular position, so that the head touches the posterior end, and is excellently camouflaged. The larva continues to extend the midrib or veins of new leaves which are eaten, even though it no longer rests on these perches in later instars, and builds the same pile of leaf material and frass on all new leaves. Müller's figure of the final instar larva (Taf. 3, fig. 5) shows it in the defensive, Front-Arched-Rear-Up position of Aiello (1984), and he also stated that the larva rested in the curled position with the head curved sideways.

Habitat and adult ecology: This subspecies is apparently common, and females occur in a much higher proportion with respect to males than in the Andean *A. l. lara*. It has been recorded from August to May. Hoffmann (1936) reports that adults feed at flowers of *Mikania*. Ebert (1969) found the subspecies to be uncommon in Minas Gerais, in primary high and low canopy forest habitats. Brown (1992) states that it is rare and local in the Serra do Japi, in São Paulo, where it can be seen at hill tops, on flowers and along river banks. It occurs typically in riverine habitats where there is moister forest, up to 1000m. The great variation in dorsal wing pattern of this subspecies may be due, as Fruhstorfer (1908) suggested, to mimicry with sympatric forms of *Agrias claudina* (Godart, [1824]). According to Fruhstorfer, *A. claudina* exhibits a parallel reduction in the amount of red on the DFW from Espírito Santo to Santa Catharina, and this prompted him give the name *pseudagrias* to southern forms of *Adelpha lycorias*.

Specimens examined (112♂, 63♀):
"**MEXICO**" (1♂): *Chiapas*: Comitán 1♂ AME-error. "**PERU**" (1♂): *Junín*: Chanchamayo 1♂ USNM-error. **BRAZIL** (102♂, 53♀): *Espírito Santo*: no specific locality 3♀ BMNH, 1♂, 1♀ MCZ, 1♀ AMNH; *Minas Gerais*: Leopoldina 2♀ ZMHU; Nova Lima Oct. 1♂ AME; Palma 1♀ BMNH; Sabará, Rio das Velhão 1♂, 1♀ BMNH; no specific locality 1♂ BMNH; *Paraná*: Castro 8♂, 1♀ BMNH, 5♂, 1♀ USNM; Caviuna 1♂, 1♀ AMNH; N. Paraná 14♂, 4♀ AMNH, 2♂, 1♀ USNM; Ponta Grossa 3500' Dec. 3♂, 5♀ BMB; União da Vitória 2000' Dec. Jan. 1♂ BMB; *Rio de Janeiro*: Novo Friburgo 2♂ ZMHU; Rio 7♂, 2♀ BMNH, 3♂ MCZ; Rio de Janeiro Aug. 3♂ AMNH, 1♀ BMB, 1♂, 1♀ BMNH; *Rio Grande do Sul*: Rio Grande do Sul 1♂ ZMHU; *Santa Catharina*: Blumenau 1♂ BMNH, 2♂, 1♀ ZMHU, 1♀ MCZ, 1♂ AMNH; Brusque 2♀ AME; Corupá 1♀ AMNH; Florianópolis 1♀ BMB; Joinville 20-200m Mar. Apr. 1♂ USNM, 1♂ MUSM; Rio Natal 550m Mar.-May 3♂ MUSM; Rio Natal, nr. Rio Vermelho 900-1450' Mar. 1♀ FSCA; Rio Vermelho 850m May 1♂ MUSM, 1♂ BMB, 1♂, 1♀ AMNH; São Bento do Sul Mar. 1♀ FSCA; Serrinha do Pirai, W. Joinville 950' Mar. 5♂ FSCA; no specific locality 1♂, 3♀ BMNH, 2♂, 1♀ MCZ, 1♀ ZMHU, 2♂, 4♀ USNM, 2♀ BMB, 4♂, 1♀ AMNH; *São Paulo*: Bahuru 3♂ BMNH; Casa Branca 1♂ ZMHU; São Paulo 4♂, 2♀ BMNH, 1♂ USNM, 1♂ AMNH; Mogi-Guaçu 1♂ USNM; *Not located*: S. Brazil 2♂ BMNH, 2♀ BMB, 1♂ MCZ; no specific locality 5♂, 2♀ BMNH, 2♂ MNHN. **PARAGUAY** (1♂): *Canindeyú*: Pozuelo Dec. 1♂ JFL. **COUNTRY UNKNOWN** (8♂, 10♀): Fazendo Coaya 1♂ MCZ; no specific locality 4♂, 4♀ BMNH, 1♀ AME, 1♀ USNM, 2♂ BMB, 2♀ MNHN, 2♀ MCZ.

Additional locality data: **BRAZIL**: *Minas Gerais*: nr. Poços de Caldas 1000-1400m Jan. Mar. Apr. May (Ebert, 1969); Passa Quatro; *Rio de Janeiro*: P.N. Itatiatia (Zikán & Zikán, 1968); *Santa Catharina*: Jaraguá Mar. Apr. Jul. Aug. (Hoffmann, 1936); *São Paulo*: Mata de Santa Genebra, nr. Campinas (Ecoforça, 2000); Serra do Japi (Brown, 1992). **PARAGUAY**: *Alto Paraná* (Kochalka *et al*., 1996). **ARGENTINA**: *Misiones* (Hayward, 1951).

Adelpha lycorias lara (Hewitson, 1850)

Figs. 2b; **92e,f**; *306*

Heterochroa lara Hewitson (1850: 437, pl. IX, fig. 8)

TL: Venezuela. **Types**: **BMNH**(T): **ST**♂: "Illustrated in the Butterflies of Venezuela A. Neild, 1996//2//Venezuela Hewitson Coll. 79-69 Heterochroa lara. 1.//B.M. TYPE No. Rh. 9794 Heterochroa lara ♂ Hew.//Lara//Type//Syntype" [examined]

=*Adelpha lara mainas* Fruhstorfer (1915: 512)

TL: Colombia to Bolivia. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//TYPE//Yungas Bolivia//Type//Syntype" [examined]

Adelpha lara Hew., Kirby (1871); *Adelpha lara fassli* Fruhst., D'Abrera (1987); *Adelpha lycorias lara* Hew., Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that taxon. The width of the red DFW postdiscal band varies slightly throughout the range, without geographic correlation.

Hewitson (1850) described this taxon based on an unspecified number of specimens in his own collection from Venezuela, and figured the dorsal surface of what appears to be a male. A syntype male is in the BMNH. Fruhstorfer (1915) described *mainas* based on specimens from Colombia to Bolivia, and figured a specimen under the name *lara*. There is a syntype in the BMNH from Bolivia, in addition to a male from Colombia and a male from Peru from Fruhstorfer's collection which bear neither determination or type labels. The principal diagnostic character, the more irregular distal edge of the red band, is simple individual variation, and Hall (1938) synonymised the name with *lara*. D'Abrera (1987: 634) figured a Colombian specimen from the BMNH as "*Adelpha lara* f. *transiens*", which is typical of the species except in having a slightly paler and broader DFW postdiscal band, probably showing intergradation to *A. lycorias melanippe*. The name *transiens* is based on an anonymous label in the drawer at the BMNH, and since D'Abrera offered no description or diagnosis the name is a *nomen nudum*.

This taxon has traditionally been regarded as a distinct species, although Fruhstorfer (1915) suggested that it was probably conspecific with *A. lycorias lycorias*. The bright red coloration of the DFW band is unique within *Adelpha* and suggests *lycorias* and *lara* are sister taxa, and since there are no genitalic or fundamental wing pattern differences between the two taxa, I regard *lara* as a subspecies of *A. lycorias*, where it was placed by Neild (1996). My reasons for considering *A. l. lara* also conspecific with *A. l. melanippe* are discussed under that taxon.

Range: This subspecies is known from the island of Trinidad, from the Sierra Nevada de Santa Marta in Colombia, the Sierra de Perijá on the Colombia/Venezuela border, in Venezuela from the Sierras de El Tamá and Turimiquire, the Cordillera de Mérida and la Costa, and along the eastern Andes to northeastern Argentina. In addition, there are several records in Colombia of the subspecies from the western slopes of the Cordillera Oriental, in the provinces of Cundinamarca and Huila, while specimens of *A. l. melanippe* showing some intergradation to this subspecies are known from the eastern slopes of the Cordillera Central in southern Tolima.

Habitat and adult ecology: This is one of the most common species of *Adelpha* in the Andes, though it is apparently more scarce in Venezuela (Neild, 1996) and rare in Trinidad (M. Cock, pers. comm.), though Barcant (1970) reports that in the 1930s the species was common there. It occurs in both primary and disturbed premontane rain forest habitats, from around 500m at the base of mountains to at least 1800m. Males are typically encountered along forest edges, river sides and wide paths, where they frequently puddle at water seepage, particularly at urine, and are also attracted to rotting fish and dung. In contrast to the nominate subspecies, females are considerably more scarce in collections than males, and I have never see any in the field.

Specimens examined (595♂, 15♀): † - trans. to *A. l. melanippe*, slight orange scaling at distal edge of DFW postdiscal band.

"**PANAMA**" (1♂): *Chiriquí*: Chiriquí 1♂ BMNH-error. **TRINIDAD** (9♂): *St. George*: Fondes Amandes 1♂ AME; Hololo 1000' 1♂ AME; *Not located*: North Mts. Dec.-Jan. 1♂ BMB; no specific locality Jan. Oct. Dec. 1♂ AME, 5♂ BMB. **VENEZUELA** (14♂, 3♀): *Aragua*: Portochuelo 1100m May 1♂ MUSM; *Barinas*: La Chimenea Jun. 1♂ MUSM; *Mérida*: Mérida 3♂ BMNH, 2♂ ZMHU, 1♀ USNM; Montan. Sierra 3000' May 1♂ BMNH; Pedregosa 3000m Nov. 1♂ BMNH; *Sucre*: Quebrada Secca, Cumaná Jan. 1♂ BMNH; *Not located*: no specific locality 3♂, 2♀ BMNH, 1♂ AFEN. **COLOMBIA** (99♂, 6♀): "*Boyacá*": Muzo Jun. Jul. 1♂ BMNH, 1♂ BMB, 1♂ AMNH-error?; Otanche (*leg.* J. Urbina) Jun. Nov. 2♂ JFL-error?; *Caquetá*: Florencia 1500m Mar. 1♂ ESM; *Cundinamarca*: Aguaditas, Fusagasugá Jan. Feb. 1♂ ESM, 1♂ USNM; Bogotá 18♂, 2♀ BMNH, 1♂ ZMHU, 1♂ AME, 2♂ USNM, 1♂ BMB, 1♂, 1♀ MNHN, 1♂ MCZ; env. Bogotá 18♂, 1♀ BMNH; La Mesa 4000' May Jun. 2♂ BMB; Susumuco 1♂ BMB; Viotá 1200m May 1♂ LMC; *El César*: Manaure 1♂ BMNH; Río Los Clavos Aug. 800m 1♂ BMNH; *Huila*: Gigante 1♂ FSCA; *Magdalena*: Guatapuri village, Santa Marta 1250m Sep. 1♂ BMNH; San Pedro de la Sierra 1400m Sep. 1♂ BMNH; *Meta*: U. Río Negro 800m 1♀ BMB; *Nariño*: Monopamba 1600m Feb. Sep. 2♂ ESM, 1♂ LMC; *Not located*: "Bolivia" 1♂† MCZ; Bought at Villavicencio 2♂ BMNH; no specific locality 28♂ AMNH, 1♀ BMNH, 1♂ AME, 1♂ USNM, 1♂ MNHN, 2♂(1†) MCZ. **ECUADOR** (83♂, 2♀): *Loja*: El Monje 1♂ USNM; env. de Loja 1♂ BMNH, 2♂ USNM, 2♂ BMB; *Morona-Santiago*: Macas 1♂ BMNH; Río Abanico Oct. 3♂ MJP; 2°-4°S, 78°W 875m Nov. Dec. 6♂ AMNH; *Napo*: Archidona Apr. 1♂ BMNH; "Chichicorrumi" Oct. 1♂ MJP-error?; "Río Coca" 2♂ AME-error; Río Hollín Sep. 2♂ DAT; Río Napo Jul. 3♂ BMNH; Tena-Loreto rd., km 49, 1350m Mar. 1♂ KWJH; *Pastaza*: Alpayacu 1♂ BMNH, 1♂ BMB; "Cururai" 1♂ BMNH-error; Shell Jun. 1♂ DAT; *Tungurahua*: env. de Ambato 1♂ BMNH; El Topo Jul. 1♂ MUSM; La Mascota 1200m Aug. 1♂ AME; La Victoria 1♂ BMNH; Palmera 1♀ AMNH; Río Chinchin Grande 1400m Dec. 1♂ AME; Río Negro Jul. 1♂ FSCA; Río Verde 1♂ BMNH; Río Zuñac 1300m Jul. 1♂ KWJH; Yunguilla, nr. Baños 1♂ USNM; *Zamora-Chinchipe*: Layaico 1000m Nov. 2♂ AME; Palanda 1♂ BMNH; Zamora 3-4000' Oct. 29♂ BMNH, 1♂ AME; *Not located*: Oriente 4♂ AMNH; upper Napo Jan. Feb. 1♂ AMNH; no specific locality 7♂ MCZ, 1♂ BMNH, 1♀ BMB. **PERU** (289♂, 3♀): *Amazonas*: Chachapoyas 3600' 21♂ BMNH, 1♂ BMB; Falso Paquisha 800m Oct. 1♂ MUSM; Huambo 3700' 2♂ BMNH; Río Utcubamba 2500' May 1♂ USNM; *Ayacucho*: Candalosa 1300m Jun. 1♂ AME; *Cajamarca*: Río Tabaconas 6000' 1♂ BMNH; Tambillo 5♂ BMNH; *Cuzco*: Buenos Aires 2-2300m Dec. 1♂ MUSM; Buenos Aires, 20-28 km E., 12-1500m Dec. 2♂ MUSM; Caradoc 4000' Feb. 3♂ BMNH; Cuzco 1♂ MNHN; Marcapata 4500' 4♂ BMNH; Quebrada Quitacalzón 1050m May 1♂ MUSM; Quillabamba 950-1050m Mar.-Apr. 1♂ MUSM; Río Urubamba 1♂ MNHN; Santa Isabela, Cosñipata 12-1500m Feb. 1♂ MUSM; Vilcanota 3000m 1♂ ZMHU; *Huánuco*: Cord. del Sira 1380m Aug. Sep. 1♂ MUSM; Huánuco 750m Oct. 2♂ AME, 1♀ BMB; Río Rondo Dec. 1♂ AMNH; Tingo María Mar.-Aug. Nov. Dec. 5♂ FSCA, 13♂, 1♀ AME, 2♂ MUSM, 1♂ USNM, 1♂ BMB; upper Río Huallaga Nov. 1♂ AMNH; *Junín*: Chanchamayo 72♂ BMNH, 9♂ AMNH, 3♂ AME, 1♂ USNM, 15♂, 1♀ BMB, 1♂ MCZ; Ipokiari May 1♂ MUSM; Perené R. Mar. 1♂ BMNH; Piches & Perené Rivers 2-3000' 1♂ USNM; Río Perené 1♂ MNHN; Satipo Sep.-Nov. 4♂ AME, 1♂ BMB; Utcuyacu 5000' 1♂ BMNH; *Loreto*: "Nauta" 1♂ BMNH-error; "Río Negro" [=Río Huallaga] 2♂ BMNH; *Madre de Dios*: Puerto Maldonado 250m Aug. 1♂ AME; *Pasco*: Huancabamba Aug. 5000' 4♂ BMB; Oxapampa 1♂ MUSM; Pichis rd. 2♂ ZMHU; Pozuzo 800-1000m 11♂ BMNH, 3♂ MUSM, 1♂ AME, 2♂ BMB; Río Colorado 1♂ MCZ; *Puno*: Carabaya Apr. 3♂ AMNH, 2♂ BMNH; Chaquimayo 2500-3000' Aug.-Oct. 1♂ BMNH; Chirimayo 1000' Jul. 4♂ BMNH; Inambari 2♂ BMNH, 2♂ BMB; La Oroya 3000' Jan. Mar. May Oct. 7♂ BMNH; La Pampa, Río Huacamayo 2500' Nov. 1♂ BMNH; La Unión, Río Huacamayo 2000' Jan. 2♂ BMNH; San Gaban 2500' Mar. Apr. 2♂ BMNH; Sto. Domingo 4500' Jan. 7♂ BMNH; Yahuarmayo 1200' Feb. Mar. 1♂ BMNH; *San Martín*: Huayabamba 3500' 7♂ BMNH, 1♂ ZMHU; Jepelacio 1100m May 1♂ AME; Moyobamba 4♂ BMNH; Tarapoto 1♂ MNHN; *Not located*: Río Huallaga 8♂ AMNH, 1♂ BMB; Quebrada Chaupimayo 12-1500m Feb. 1♂ AMNH; no specific locality 1♂ BMNH, 2♂ AME, 5♂ USNM, 3♂ BMB, 1♂ MNHN, 2♂ MUSM, 1♂ MCZ. **BOLIVIA** (68♂, 1♀): *El Beni*: no specific locality 1♂ USNM; *Cochabamba*: Charapaya 1300m Jun. 2♂ BMNH; Cochabamba 4♂ BMNH; El Palmar Mar. 2♂, 1♀ AME; 5 days N. Cochabamba 1♂ MCZ; San Antonio 1800m 1♂ ZMHU; *La Paz*: Apolobamba 1♂ BMNH; Coroico 650m Apr. May 1♂ BMNH, 1♂ AMNH, 2♂ BMB; Guanay, Río Mapiri 1500' Aug. 7♂ BMNH; La Paz Apr. 1♂ MCZ; 20 mi. above Mapiri 4000' 3♂ BMNH; Río Unduavi 2000m Feb. 1♂ BMNH; San Augustín 3500' Sep. 1♂ BMNH; Songo 1♂ MCZ; Yolosa 12-1500m Sep. 2♂ KWJH; Yungas 1000-1200m Nov. 5♂ BMNH; *Potosí*: Tupiza 1♂ ZMHU; *Santa Cruz*: Bueyes 1♂ BMNH, 1♂ ZMHU; Prov. Sara Feb.-Apr. 1♂ BMNH; Río Negro 1♂ AME; *Not located*: Yunga 1♂ BMNH; no specific locality 10♂ BMNH, 2♂ AMNH, 1♂ MNHN, 2♂ MCZ. "**BRAZIL**" (2♂): *Pará*: Pará 1♂ BMB-error; *Not located*: no specific locality 1♂ USNM-error. **COUNTRY UNKNOWN** (30♂): Amazon 1♂ USNM; upper Amazon 1♂ USNM; no specific locality 4♂ AMNH, 2♂ BMNH, 7♂ AME, 4♂ USNM, 9♂ MCZ, 2♂ MNHN.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Abanico

1600m Dec.; Río Miriumi Oct.; *Napo*: Cerro Lumbaquí Norte 800m Aug.; San Rafael 1200m Aug.; Tena-Loreto rd., km 49, Aug. Oct.; *Pastaza*: Hacienda Moravia Feb.; Río Llandia Aug.; Río Puyo Oct.; Shell Feb. Apr.; *Sucumbíos*: La Bonita-Rosa Florida rd., km 12, 2000m Mar.; Quebrada El Copal Nov.; Río Palmar Nov.; Río Sucio Nov.; *Tungurahua*: Río Machay Jul.; *Zamora-Chinchipe*: Quebrada Chorillos Nov.; Quebrada San Ramón Oct.; Romerillos Nov. (Willmott & Hall, sight records). **TRINIDAD**: *St. George*: Morne Bleu-Morne Brule Ridge La Laja South rd. Jan. (M. Cock, pers. comm.). **ARGENTINA**: *Salta*: Tartagal (Köhler) (Hayward, 1935).

Adelpha lycorias melanippe Godman & Salvin, 1884 **stat. nov.**

Figs. **92g,h**; *306*

Adelpha melanippe Godman & Salvin (1884: 296)

TL: Colombia. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9793 Adelpha melanippe ♂ G. & S.//B.C.A. Lep. Rhop. Adelpha melanippe G. & S. Godman-Salvin Coll. 1916.-4.//♂//Interior of Colombia Wheeler//Type H.T.//Syntype" [examined]

Adelpha melanthe melanippe G. & S., Fruhstorfer (1915)

Identification, taxonomy and variation:

Adelpha l. melanippe is distinguished from *A. l. melanthe* under that subspecies. *Adelpha l. spruceana* has a narrower and paler orange DFW postdiscal band, which has the distal edge noticeably "stepped" at vein M_3 and does not extend to the distal margin in cell Cu_1-M_3 on the VFW. There is slight variation in the shape of the orange DFW postdiscal band, specimens from Santander in Colombia typically have narrower bands shaped as in *A. l. lara*.

Godman & Salvin (1884) described this taxon as a species based on an unspecified number of specimens in their collection from Colombia, and a syntype male is in the BMNH (Fig. 92g,h). They compared it to both *A. l. melanthe* and *A. l. spruceana*, and pointed out all of the distinguishing features. The taxon was treated as a subspecies of *A. melanthe* by Fruhstorfer (1915) and Hall (1938), while Fruhstorfer also separated his *A. melanthe* and *A. lycorias*/*lara* into separate species groups based on vein R_1 originating before the end of the discal cell in the former, and after the end in the latter. However, this character is weak since *A. l. spruceana* has the vein arising at the end of the cell, intermediate between its origin in *A. l. lara* and *A. l. melanthe*. In the BMNH there are six male specimens of *A. lycorias* from the Bogotá area, in addition to several in other collections, that are clearly intermediate in wing pattern between *A. l. melanippe* and *A. l. lara*. In these specimens the colour of the band is typically pinkish in the middle, in the area occupied by the band in *A. l. lara*, while the distal edges are orange, and the band shape varies from that of *A. l. melanippe* to that of *A. l. lara*. The yellowish coloration in the basal half of the ventral wings also varies from relatively heavy, as in typical *melanippe*, to almost absent, as in typical *lara*. I regard these specimens as good evidence that *lara* and *melanippe* are conspecific. Since *melanippe* shares with *melanthe*, *spruceana* and *wallisii* the yellowish ventral coloration, I regard these taxa as also conspecific with *lara*, and *lycorias*. I therefore place *melanippe* as subspecies of *A. lycorias* (**stat. nov.**). Nevertheless, this placement is strictly provisional as discussed under *A. lycorias*. I have examined six specimens of *A. l. lara* reputedly from sites within the range of *A. l. melanippe*, from Muzo, a general labelling locality, and Otanche, collected by a local dealer, and regard these as labelling errors. I also regard a single specimen of *A. l. melanippe* from Guayabetal on the eastern slopes of the Cordillera Oriental, within the range of *A. l. lara*, and two males from Bitaco and Río Garrapatos, within the range of *A. l. wallisii*, as mislabelled.

Range: This subspecies is known from the eastern slopes of the Cordillera Central from Caldas to Tolima, and from the western slopes of the Cordillera Oriental from Santander to Boyacá; this range may be disjunct, or it may be continuous across the valley of the Río Magdalena, which drops to 500m, depending on the elevation at which this subspecies occurs. Intergrades to *A. l. lara* occur in the Bogotá area and in southern Tolima, while the shape of the DFW postdiscal band in specimens from Santander suggests some intergradation there also with this subspecies.

Habitat and adult ecology: This taxon is not uncommon in collections and has been recorded from 800-1500m. Its behaviour and habitat are presumably similar to *A. l. lara*.

Specimens examined (77♂, 2♀): † - trans. to *A. l. lara*. "**HONDURAS**" (1♂): no specific locality 1♂ BMB-error. **COLOMBIA** (70♂, 2♀): *Boyacá*: Muzo 2♂ BMNH, 1♂ AMNH; Otanche (*leg.* J. Urbina) Feb. Nov. 2♂ JFL; Río Minero, Muzo 900-1000m Jul. 1♂ AMNH; *Caldas*: Río de la Miel Mar. 1♂ ESM; *Cundinamarca*: Bogotá 14♂ BMNH, 1♂ ZMHU, 2♂ BMB, 2♂ AMNH; env. de Bogotá 6♂, 1♀ BMNH, 1♂ MNHN; Cananche 1♂ BMNH; Paime Aug. 1♂ AMNH; "*Meta*": Guayabetal, Manzanares 1500m Mar. 1♂ ESM-error?; *Santander*: La Borroscosa Dec. 1♂ AMNH; La Sevilla 800-1200m 1♂ AMNH; La Soledad Dec. 1♂ AMNH; Río Opón Dec. 1♂ AME; *Tolima*: Las Guayabas, Río Cucuana 1500m Mar. 2♂† AME; Payande 800-950m Mar. 1♂ AME; Río Atá 1000m May 1♂† AME; Río Chili 1♂ BMNH; no specific locality 1♂ BMNH; "*Valle del Cauca*": Bitaco May (*leg.* Salazar) 1♂ KWJH-error?; Río Garrapatos (*leg.* Constantino) May 1♂ LMC-error?; *Not located*: Interior of Colombia 1♂ BMNH; San Rafael, W. Colombia 3500' (*leg.* A. Hall) Jun. Jul. 1♂ BMB; no specific locality 8♂ BMNH, 7♂, 1♀ ZMHU, 1♂ AME, 4♂ BMB. "**PERU**" (2♂): *Junín*: Satipo 2♂ AME-error. **COUNTRY UNKNOWN** (4♂): no specific locality 1♂ BMNH, 1♂ AME, 2♂ AMNH.

Adelpha lycorias melanthe (H. W. Bates, 1864)

Figs. 2d; **92i,j**; 183a,b; *306*

Heterochroa melanthe Bates (1864: 129)

TL: Interior valleys of Guatemala. **Types**: **BMNH**(T): **ST**♂: "Type. sp. figured//B.C.A. Lep. Rhop. Adelpha melanthe Bates Godman-Salvin Coll. 1916.-4.//♂//Motagua Vall.//B.M. TYPE No. Rh. 9791 Heterochroa melanthe ♂ Bates//Motagua Valley F.D.G. & O.S.//Syntype//Type H.T." [examined]

Adelpha melanthe Bates, Kirby (1871); *Limenitis melanthe* Bates, Ross (1964, 1976); *Adelpha lycorias melanthe* Bates, Neild (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. l. melanippe* by having a broader pale yellow postdiscal band on the VFW, extending completely to the margin in cell M_3-M_2, with the distal edge of this band connected to pale yellow subapical spots in cells M_2-M_1 and M_1-R_5 by thin yellow rays, and by having poorly defined, yellowish submarginal spots in cells M_1-$Sc+R_1$ on the VHW. *Adelpha l. spruceana* has a much narrower DFW and VFW postdiscal band, which does not reach the distal margin in cells Cu_1-M_3 and M_3-M_2, and also lacks the pale yellow VFW subapical and VHW submarginal spots. Some specimens of this taxon have whitish scaling in the DFW discal cell between cell bars two and four, but there is otherwise little variation, except in one male from Veraguas (Panama) in the BMNH, which has yellow subapical spots on the DFW in cells M_1-R_5 and R_5-R_4, and the discal area of the VHW entirely yellow. I regard this as an aberration.

Bates (1864) described this subspecies based on an unspecified number of male specimens from Guatemala, and his detailed description and a syntype male in the BMNH (Fig. 92i,j) leave no doubt as to its identity. This taxon has traditionally been treated as a distinct species (Fruhstorfer, 1915; Hall, 1938; DeVries, 1987; Lamas & Small, 1992), but since I regard the similar and allopatric taxa *melanippe* and *wallisii* as conspecific with *A. lycorias lara*, I also treat *melanthe* as a subspecies of *A. lycorias*, as did Neild (1996).

Range: Mexico to central Panama. I regard the three putative Colombian specimens as mislabellings.

Immature stages: The egg is typical of the genus (Aiello, 1984: Panama) and is laid singly (DeVries, 1986: Costa Rica) on the upper surface of a leaf near a damaged portion (Aiello). Up to several eggs may be deposited on a single plant (DeVries, 1986). Aiello (1984) figures the mature larva (fig. 4) and describes it as being grey (darker dorsally), except the dorsal surface of the thorax to A2, which is yellowish brown, and the sides of these segments, which are dark brown. The head capsule (Aiello, 1984: fig. 2) is unpatterned and covered with short setae and chalazae. The larval scoli are grey with black spines and apices and the entire body is densely clothed in short, thick grey setae. The scoli on T2 and T3 are inclined anteriorly, that on A2 is slightly inclined posteriorly, and all the scoli are approximately similar in morphology, being long and thin with long, thin and tapering lateral spines. Except for the scolus on A1, which is very reduced, the remaining scoli are more similar in size than in most other species, that on A2 being slightly longer with a broad base. DeVries (1987) also describes and figures the fifth instar larva from Costa Rica (fig. 24, D), and his observations match those of Aiello. The pupa (Aiello, 1984: fig. 6; DeVries, 1987, fig. 24, C) has a very pronounced dorsal hook on A2 and very small, rounded head horns, and is dark brown with "dull, shiny bronze" wing pads (DeVries, 1987). Small also reared this species in Panama and there is preserved material of the pupa, head capsules and all instars in the USNM.

The larval behaviour is similar to other species, with the pile accumulated at the base of the leaf consisting predominantly of leaf material (Aiello, 1984). According to DeVries' (1986) observations in Costa Rica, early instars make frass chains and later instars rest on the leaves, in an elongate "N"-shape, probably the Front-Arched-Rear-Up position, looking like dead leaf material (DeVries, 1987). Larvae eat all leaves, but prefer old leaves. They occur on young to mature plants, along river and forest edges, in primary forest and forest light gaps. The development times of various instars are listed by Aiello (1984: table 2) and the entire life cycle lasts at least 37 days.

Habitat and adult ecology: This subspecies is common throughout its range in disturbed areas in lowland evergreen and semi-deciduous forest. In Mexico, it has been recorded from near sea level to 1700m, throughout the year (Ross, 1976; de la Maza, 1987; de la Maza & de la Maza, 1987). Ross (1976) reports that individuals hill top in sun in the deciduous forest of the Sierra de Tuxtla. Austin *et al.* (1996) report that it is rare in the Tikal area of Guatemala, occurring along forest edges in March and September, the driest and wettest months of the year respectively. DeVries (1987) reports that the species occurs in Costa Rica from sea level to 1400m in virtually all forest habitats, typically encountered as solitary individuals. Males perch during late morning in sunlit spots in the subcanopy and vigorously chase other *Adelpha*. Both sexes feed on rotting fruits and mammal dung, and males may be found puddling. Females are typically seen searching for oviposition sites in the middle of the day, and the majority of hostplants are characteristic of secondary growth. Apparently the choice of hostplant may depend on the region; DeVries found that *Trema* was used in the Pacific deciduous forests, *Urera* and *Myriocarpa* in the Atlantic lowlands and *Cecropia* in montane habitats.

Specimens examined (150♂, 68♀):

MEXICO (53♂, 25♀): *Chiapas*: Bomboná 1500m Sep. 1♂ AME; Musté Sep. 3♂ AMNH; Ocozocoautla Jan. 1♂ AMNH; Tapilula Aug. 1♂ MUSM; San Carlos Jun. 2♂ AME; San Jerónimo 600m Aug. 1♂ USNM, 1♂ AMNH; San Quintín Aug. 3♂, 1♀ AME; Tuxtla Gutiérrez 2000' Jan. 2♂ AME; no specific locality Aug. 9♂, 2♀ AMNH, 1♀ FSCA; *Oaxaca*: Candelaria Nov. 1♂ AMNH; Loxicha 550m Aug. Sep. 1♂, 1♀ AME; Oaxaca 1♂ ZMHU; San Gabriel de Mixtepec Dec. 1♀ AMNH; Soyolapan el Bajo Aug. 2♀ AMNH; Temascal Oct. 1♂ MUSM; Valle Nacional 800m Jul. 2♂, 1♀ MUSM; *Puebla*: Tequelquitla 625m Jul. 1♂, 1♀ MUSM; *San Luís Potosí*: El Salto Falls 360m Oct. Dec. 2♂ FSCA, 1♀ AME; Quinta Chilla 1♀ AMNH; San Isidro Dec. 1♂ AMNH; Tlamaya Canyon Dec. 1♂ AMNH; Xilitla Jul. Nov. 1♀ AMNH, 1♀ FSCA; *Veracruz*: Catemaco Jun.-Jul. 2♂ AME; Córdoba 3♂ AMNH, 1♂ BMNH, 1♂ MCZ; Fortín 2-3000' 1♂ FSCA; Jalapa 1♀ BMNH; Misantla Dec. 1♂ AMNH, 2♂, 2♀ BMNH; Papantla 1♂ AMNH; nr. Sontecomapan 300m Jul. 1♀ KWJH; Orizaba 1♂, 1♀ USNM; Presidio Jun.-Jul. 1♂, 4♀ AME; Tezonapa Aug. 1♂ AMNH; *Not located*: no specific locality 1♂, 2♀ BMNH, 1♂ AME, 1♂ MCZ. **GUATEMALA** (27♂, 11♀): *Alta Verapaz*: Baléu 1350m Jun.-Aug. Sep. Oct. 5♂, 2♀ AME, 3♂ AMNH; Chiacám 1♂ BMNH; Tamahú Nov. 2♂ AMNH; Tocoy 1♂ BMNH; Polochic Valley 1♂, 1♀ BMNH; Yuxilijá Oct. 1♀ AMNH; *Baja Verapaz*: Chejel 1♂ USNM; San Jerónimo 2♀ BMNH; *Chimaltenango*: Acatenango 750m Nov. 1♂ AMNH; Panaiabal 1250m Dec. 1♂ AME; Yepocapa 1♂ AMNH; *El Progreso*: Motagua Valley 1♂ BMNH; *Escuintla*: Palín Jul. Aug. Oct. 1♂ USNM, 2♂, 1♀ BMB; *Quezaltenango*: Volcán Santa María 1♀ USNM; *Santa Rosa*: Chiquimulilla Sep. 1♀ BMNH; Guazacapán Nov. 2♂ BMNH; *Not located*: Centr. Valleys 1♂, 1♀ BMNH; no specific locality 3♂ BMNH, 1♀ ZMHU. **EL SALVADOR** (5♂, 2♀): *Cuscatlán*: San Ramón 1100m Oct. 1♂ AME; *San Salvador*: Apopa 2000' Sep. 1♂ BMB; San Salvador 600m Nov. Dec. 2♂ AME; *La Libertad*: Jayaque Aug. 1♂ AMNH; Los Chorros Dec. 2♀ AME. **HONDURAS** (12♂, 2♀): *Cortés*: La Cumbre, Mar. 1♂ BMNH; San Pedro Sula 9♂, 2♀ BMNH; *Not located*: La Jutoza, on sugar cane juice 1♂ USNM; no specific locality 1♂ ZMHU. **NICARAGUA** (3♂): *Managua*: Managua 1♂ AME; *Matagalpa*: Matagalpa 1♂ BMNH; *Chontales*: Chontales 1♂ BMNH. **COSTA RICA** (17♂, 16♀): *Alajuela*: San Mateo 1-2000' Nov.-Dec. 1♂ USNM; Volcán Poás Dec. 1♂ BMNH; *Cartago*: Azahar de Cartago Feb. 1♂ BMNH; Cachí 1♀ BMNH; Irazú 1♂ BMNH; Juan Viñas Jan. Mar. Nov. 2♂ BMNH, 1♀ USNM; Tres Ríos 5000' Dec. 1♂, 1♀ USNM; Turrialba Jan. 1♂ BMB; *Guanacaste*: Cañas Jul. 1♂ FSCA; Liberia Jul. 1♂ AME; Nosara Sep. 1♂, 2♀ FSCA; San Antonio 1♀ AME; *Heredia*: Chilamate Dec. 1♂ FSCA; La Selva Jul. 1♀ AMNH; *San José*: Braulio Carillo Mar. Sep. Oct. 1♂ FSCA, 2♂ BMB; *Not located*: no specific locality 4♀ BMNH, 2♂, 2♀ MNHN, 3♀ AMNH. **PANAMA** (28♂, 10♀): *Chiriquí*: Brava I. 26,27/1/02 J.H. Batty 1♀ BMNH; Bugaba 3♂ BMNH; Cerro La Galera Aug. 1♂ USNM; Chiriquí 2500-4000' Dec. 2♂ BMNH, 2♂, 1♀ ZMHU, 1♂ FSCA, 1♂ USNM, 1♂ BMB; *Coclé*: nr. El Copé, Atlantic slope 600m Mar. 1♂ USNM; *Colón*: Colón Feb. 1♂ FSCA; nr. Gamboa 1♀ BMNH; Piña 1-200m Mar. Aug. 1♂ FSCA, 1♀ AME; *Panamá*: Cerro Campana 950m Nov.-Jan. 5♂ USNM; Cerro Galera Feb. *ex* pupa 2♀ USNM; Empire Feb. 1♀ BMB; Las Cumbres Oct. 1♂ FSCA; Madden Forest Jul. Aug. Nov. 2♂ AME, 1♂ USNM; *Veraguas*: Veraguas 2♂, 1♀ BMNH; *Not located*: Canal zone Oct. 1♀ BMNH, 1♂ AME; Madden Dam 1♀ FSCA; no specific locality 1♂ BMNH, 1♂ USNM. "**COLOMBIA**" (2♂, 1♀): *Antioquia*: Frontino 1♂ BMNH-error; *Valle del Cauca*: Dagua 800m 1♂ BMNH-error; *Not located*: no specific locality 1♀ BMNH-error?. "**BOLIVIA**" (1♂): *La Paz*: Río Madidi 1♂ BMNH-error. **COUNTRY UNKNOWN** (2♂, 1♀): no specific locality 2♂ BMNH, 1♀ USNM.

Additional locality data: **MEXICO**: *Chiapas*: throughout - see de la Maza (1987) and de la Maza & de la Maza (1993); *Guerrero*: El Faisanal; *Oaxaca*: Jacatepec; Metates; Portillo del Rayo; *Puebla*: Patla; *Tabasco*: Teapa; *Veracruz*: El Vigía; Uxpanapa (de la Maza, 1987); Sierra de Tuxtla 300-800m Mar.-Nov. (Ross, 1976). **BELIZE**: *Cayo*: Augustine 500m (Ross, 1964).

Adelpha lycorias spruceana (H. W. Bates, 1864) **stat. nov.**

Figs. 2c; **92k,l**; *306*

Heterochroa spruceana Bates (1864: 129)

TL: Western valleys of Chimborazo [Ecuador]. **Types**: **BMNH**(T): **ST♂**: "B.M. TYPE No. Rh. 9792 Heterochroa spruceana ♂ Bates//Adelpha spruceana Bates Godman-Salvin Coll. 1916.-4.//Heterchroa spruceana Bates//♂//Chimborazo Ecuador Spruce Bates Coll.//♂ W. of Chimborazo 3-4000'//Type H.T." [examined]

Adelpha spruceana Bates, Kirby (1871) (Kirby listed this as No. 54a, and *melanthe* as 54), Strand (1918); *Adelpha melanthe spruceana* Bates, Fruhstorfer (1915), D'Abrera (1987)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. l. wallisii* by the orange DFW postdiscal band, and from *A. l. melanthe* and *A. l. melanippe* under those subspecies. Specimens intergrading to *A. l. wallisii* are known from southern Colombia, with very pale yellow DFW postdiscal bands, and throughout the range there is slight variation in the colour of the DFW postdiscal band, which varies from orange to yellow. I have examined one specimen in the AJ from Alluriquín and two in the PB from Lita, in western Ecuador, which have a predominantly white DFW band and are phenotypically very similar to *A. l. wallisii*. I also once observed a "white banded" *Adelpha* on the side of a high trap along the Río Tanti, near Alluriquín, and although I was unable to capture or identify the specimen I presume it represents the same phenotype as the specimens in these two collections. I regard these specimens as representing aberrant individuals of *A. l. spruceana*. Despite the rare appearance of the *wallisii* phenotype in typical *spruceana*, there is otherwise relatively little variation in either population, and I therefore maintain the two phenotypes as distinct subspecies. It is possible that such rare forms may explain some of the apparent mislabellings of specimens of other Colombian subspecies of *A. lycorias*.

Bates (1864) described this taxon from an unspecified number of specimens collected by Spruce in western Ecuador, and a syntype closely matching the description is in the BMNH (Fig. 92k,l). This taxon has formerly been considered a distinct species, or subspecies of *A. melanthe*, but since intergrades occur to *A. l. wallisii*, I treat it as a subspecies of *A. lycorias* for the same reasons as that taxon (**stat. nov.**).

Range: Western slopes of the Andes from extreme southern Colombia to central Ecuador.

Habitat and adult ecology: This subspecies is widespread and not uncommon throughout its small range, and occurs in dry and heavily disturbed habitats as well as primary forest from 700-2400m. Males are often found in open areas puddling along muddy paths through fields, along forest edges and rivers, and are strongly attracted to rotting fish. Males also perch in low numbers along wide ridge top paths, where they rest with their wings open 4-5m above the ground along the forest edge. Perching takes place during periods of bright sun in the early afternoon, and males patrol territories of 30-40m along the ridge with a gliding flight, with few wing beats.

Specimens examined (22♂, 2♀):

COLOMBIA (4♂): *Nariño*: Altaquer 1200m Dec. 1♂ LMC; La Planada 1700m May 1♂ MHNUC; Ricaurte 1700m Jul. Aug. 2♂ ESM. **ECUADOR** (17♂, 2♀): *Bolívar*: Balzapampa, Jul. Aug. 2♂, 1♀ BMNH, 1♂ AME; Chimbo 1♂ BMNH; *Chimborazo*: Huigra 3000' Feb. 1♂ BMB; no specific locality 2♂ BMNH; *Imbabura*: Paramba 2♂ BMNH; "*Morona-Santiago*": Macas 1♂ USNM-error; *Pichincha*: Hda. Santa Isabel 1200m Sep. 1♂ KWJH; La Palma, Río Pilatón 900m Jun. 1♂ KWJH; Tinalandia 700m Jun. Jul. 1♂ KWJH, 1♂ MUSM; "*Zamora-Chinchipe*": Zamora 3-4000' 1♀ BMNH-error; *Not located*: W. Ecuador Feb. 1♂ BMB; no specific locality 2♂ AMNH. **COUNTRY UNKNOWN** (1♂): "Peru?" 1♂ MNHN.

Additional locality data: **ECUADOR**: *Carchi*: El Corazón 2400m Sep.; Las Juntas Nov.; Lita, ridge east of Río Baboso Jul. Aug.; Río Chuchuví 800m Jul.; Santa Rosa Sep. Nov.; *Cotopaxi*: El Copal Aug.; *Imbabura*: Cachaco 1300m Jul.; Río Verde 1200-1450m Aug.; *Pichincha*: Mindo 1200m Aug.; Palmito Pamba Jul. Oct.; Río Chisinche Aug.; Río Las Palmeras Aug.; Río Sucio Apr.; San Antonio 1200m Jul.; Tandapi Jul. Aug. (Willmott & Hall, sight records).

Adelpha lycorias wallisii (Dewitz, 1877) **stat. nov.**

Figs. **92m,n**; *306*

Heterochroa wallisii Dewitz (1877: 90)

TL: Antioquia, Colombia. **Types**: **ZMHU**?: **ST**♂: [not located]

=*Adelpha hypsenor* Godman & Salvin (1879: 151, pl. XIV, fig. 2)

TL: Frontino, Colombia. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9795 Adelpha hypsenor ♂ G. & S.//A. hypsenor Type//♂//Adelpha hypsenor G. & S. Godman-Salvin Coll. 1916.-4.//Frontino Antioquia T.K. Salmon//Syntype//Type"; **BMNH**(M): 2**ST**?♂: "Adelpha hypsenor G. & S. Godman-Salvin Coll. 1916.-4.//Frontino Antioquia T.K. Salmon"; **ST**?♂: "Adelpha hypsenor G. & S. Godman-Salvin Coll. 1916.-4.//Frontino Antioquia T.K. Salmon//adelpha hypsenor" [all examined]

=*Adelpha hypsenor fassli* Fruhstorfer (1915: 532) **syn. nov.**

TL: Cañon del Tolima, Central Cordilleras of Colombia. **Types**: **ZMUC**: **ST**♂: "Lectotype Adelpha hypsenor fassli Fruhstorfer, 1916 G. Lamas des. 1995//Cañon del Tolima Columb. Cent. Cord. 1700m Coll. Fassl// Type//hypsenor fassli Fr.//f. fassli Fruhst. Adelpha hypsenor ♂ G. & S. Cañon del Tolima 1700m Central Cordll Colombia Fassl Modt. 7/10 1929 af [illegible] Coll. C.S. Larsen, Faaborg" [photograph examined]

Adelpha hypsenor G. & S., Fruhstorfer (1915), Andrade (1994); *Adelpha lara hypsenor* G. & S., Hall (1938); *Adelpha melanthe wallisii* Dewitz, Lamas (1989)

Identification, taxonomy and variation: This subspecies is distinguished from all others by the white DFW postdiscal band. The width of the band, particularly in cell Cu_1-M_3, is variable, as is the extent of orange at the distal margins of the band, especially in cell Cu_2-Cu_1.

Dewitz (1877) described this subspecies in comparison with *melanthe* and *lara*, stating that the DFW band was white and of similar shape to that in *lara*. The description was based on an unspecified number of male specimens collected by Wallis in Antioquia, but although they would be expected to be in the ZMHU, no syntypes have been located (Lamas, 1989). Two years later, Godman & Salvin (1879) described and figured *Adelpha hypsenor* based on an unspecified number of specimens collected by Salmon in Frontino, also in Antioquia, with no mention of *wallisii*. I have examined a syntype (Fig. 92m,n) and several further possible syntypes in the BMNH. All subsequent authors referred to this taxon as *hypsenor*, until Lamas (1989) drew attention to Dewitz's paper and synonymised *hypsenor* with *wallisii*. Fruhstorfer (1915) described *A. hypsenor fassli* based on several specimens from the Cañon del Tolima in Colombia, collected by Fassl, but neglected to say in which collection the specimens were. He stated that the oblique band of the forewings was broader, and of a more "magnificent colouring", some specimens having extensive orange at the distal margin. I have examined a photograph of a syntype specimen in Copenhagen, courtesy of Gerardo Lamas, and the DFW band is indeed broader, with heavy orange at the distal margin in cell Cu_2-Cu_1, also extending into the distal anterior edge of cell 2A-Cu_2. The shape of the DFW band is similar to that in *A. l. melanippe*, but the central and basal areas are white as in *A. l. wallisii*. Since it also originates from a locality between the ranges of the two subspecies, I suggest that this specimen is transitional *A. l. melanippe*, and therefore synonymise it with *wallisii* (**syn. nov.**).

This taxon was regarded as a distinct species by Fruhstorfer (1913, misspelt *hypsina*, 1915), as a subspecies of *A. lara* by Hall (1938) and D'Abrera (1987), and as a subspecies of *A. melanthe* by Lamas (1989). The shape of the DFW band is typical of *A. l. lara*, but the yellowish colouring in the basal half of the VHW is typical of *A. l. melanippe* and *A. l. melanthe*. The syntype of *fassli* is also clearly intermediate between *A. l. wallisii* and *A. l. melanippe*, and since I regard *melanippe* as a subspecies of *A. lycorias* (see under that taxon), I also place *wallisii* as a subspecies of *A. lycorias* (**stat. nov.**). I have examined one male of this taxon in the USNM from Muzo, within the range of *A. l. melanippe*, while there are two specimens of *A. l. melanippe*, from Bitaco and Río Garrapatos (Valle del Cauca), in the KWJH and LMC respectively, which are within the range of this taxon; I regard all of these as labelling errors (see species discussion). Three males of *A. l. melanthe* in the BMNH from Frontino, Dagua and Río Madidi, the first two sites within the range of this subspecies, are also regarded as labelling errors.

Range: This subspecies is endemic to Colombia and has been recorded from the western slopes of the Cordillera Central and from both slopes of the Cordillera Occidental as far south as Nariño, where intergrades to *A. l. spruceana* occur. If the type of *fassli* is not mislabelled, then the subspecies may also occur on the eastern slopes of the southern half of the Cordillera Central, but more distributional data are required.

Immature stages: Constantino (1998) reports that the egg is white and similar in morphology to other species. Early instars (1-4) have a white head capsule with black pits and white setae, the body is dull brown with black patches on the dorsal and lateral areas, and the thoracic scoli each have 8 whorls of spines. The mature larva has a black head capsule with brown bumps and setae, the body is dull brown with a wide black band on the lateral side of the thoracic segments and the scoli are longer. The pupa is dull brown with the typical large projection on A2, the thoracic area is golden.

Habitat and adult ecology: This subspecies appears to be not uncommon in the field, and has been recorded from 1000-2600m throughout the year. Andrade (1994) reports that it can be found in numbers and is indicative of disturbed secondary forest. Salazar (1996) found males hill topping at the summit of Cerro Ingrumá in Colombia. It is sympatric with *A. ethelda eponina* and the two are almost certainly involved in mimicry.

Specimens examined (82♂, 8♀): † - trans. to *A. l. melanippe*; ‡ - trans. to *A. l. spruceana*.

COLOMBIA (67♂, 6♀): *Antioquia*: Antioquia 4000' 1♂ BMB; Frontino 4♂ BMNH; Mesopotamia 1♂ AMNH; Valdivia 1♂ BMNH; "*Boyacá*": Muzo Nov. 1♂ USNM-error?; *Caldas*: Bocatoma, Manizales 2600m Jan. 1♂ MHNUC; Jardin Botánico de Univ. de Caldas, Manizales 2120m Nov. 1♂ MHNUC; Manizales 11♂, 1♀ BMNH, 1♀ ZMHU, 1♂ BMB; Pensilvania (*leg.* J. Salazar) 1500m Jun. 2♂ JFL; Planalto 1500m Mar. 1♂ KWJH; *Cauca*: Pescador 1450m Feb. 1♂ AME; Piendamó 1600m Jul. 1♂ LMC; Popayán 1♂ BMNH; *Chocó*: El Tabor, area a San José del Palmar (*leg.* J. Vélez) 1300m Jun. 1♂ MHNUC; San José del Palmar Apr. 1♂ KWJH; *Nariño*: El Palmar 1300m Aug. 1♂ AMNH; *Quindío*: Armenia 1♂ ESM; *Risaralda*: Distrito de Pereira 4♂, 3♀ BMNH, 2♂ BMB, 1♂ MNHN; Pueblo Rico, San Juan, 5200' Oct. 1♂ BMNH; Quebrada Río Negro, area a Pblo. Rico (*leg.* P. Valdes) 1550m Aug. 1♂ MHNUC; *Tolima*: Cañon del Tolima 1♂† ZMUC-error?; *Valle del Cauca*: Atuncela, Lobo Guerrero 1600m Nov. 1♂ LMC; Cali 1000m May Oct. 1♂ MUSM, 1♂ AME; Cali-Buenaventura Mar. 1♂ ESM; Charco Azul 2200m Aug. 1♂ JFL; nr. El Morro 1700-1900m Feb. 1♀‡ AME; Juntas 3♂ BMNH; Peñas Blancas 2000m Aug. 1♂ LMC; Queremal km 55 1200m Jul. Oct. 2♂ LMC, 1♂ ESM; Río Anchicayá 1150m Jan. 1♂ AME; Río Brava, Calima 1000m May 1♂ LMC; Río Dagua 1♂ ZMHU; *Not located*: Caucathal 3♂ ZMHU; Quibdó-Bolívar 1000m Oct. 1♂ ESM; W. Colombia 1♂ BMB; no specific locality 1♂ BMNH, 1♂ USNM, 2♂ BMB, 1♂ MCZ.

COUNTRY UNKNOWN (15♂, 2♀): no specific locality 10♂ AMNH, 1♂, 1♀ BMNH, 1♂, 1♀ USNM, 1♂ MNHN, 2♂ MCZ.

Additional locality data: **COLOMBIA**: *Caldas*: Cerro Ingrumá 2300m Jul. (Salazar, 1996); Puerto de Oro; *Not located*: Parque de Ucumarí; Santuário; Alto de Pisones (Andrade, 1994).

***Adelpha lycorias* intergrade specimens (12♂) (all Colombia):**

wallisii/*spruceana*: *Cauca*: Popayán 1♂ BMNH.

wallisii/*lara*: *Cundinamarca*: env. de Bogotá 2♂ BMNH; DFW band shaped as in *lara*, pinkish cream.

lara/*melanippe*: *Cundinamarca*: env. Bogotá 3♂ BMNH; Région du Bogotá 3♂ BMNH.

wallisii/melanippe?: *Caldas*: Manizales 3♂ BMNH; DFW band thin, shaped as in *lara*, pale pink/orange.

Adelpha attica (C. & R. Felder, 1867)

Figs. **93**; 184; 261; *307*

Identification, taxonomy and variation:

This is a very distinctive species, characterised by light to heavy orange shading over the white DHW postdiscal band in cells M_2-M_1, M_1-Rs and Rs-Sc+R_1, and a continuous orange band on the VHW extending along the basal edge of the white postdiscal band, from the costa, between discal cell bars two and three, to the tornus. There is variation in the amount of orange in the DHW postdiscal band, the width of the orange DFW postdiscal band and the size of the DFW subapical spots, and two subspecies are recognised.

This species is superficially similar to *A. malea* on the ventral surface, but the male genitalia, which lack posterior spines on the valvae, are more reminiscent of *A. jordani* and relatives, while the entirely fused VFW postdiscal series is a character otherwise typical of the *A. phylaca* group. The female genitalia possess weak but clear sclerotised bands on the corpus bursae, and the corpus bursae tapers gradually into the ductus bursae, both of which suggest that *A. attica* belongs neither in the *A. phylaca* group nor the *A. cocala* group, and its closest relatives remain unknown.

Range and status: Eastern Panama to northwestern Ecuador, Venezuela to Bolivia and western Brazil. Common to rare in primary lowland rain forest from sea level up to 1000m.

Specimens examined: 100 (98♂, 2♀)

Adelpha attica attica (C. & R. Felder, 1867)

Figs. **93a,b**; 261a,b; *307*

Heterochroa attica C. & R. Felder (1867: 421)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Bogotá Lindig//attica Felder//attica n.//Felder Colln." [examined]

=*Adelpha lesbia* Staudinger (1886: 142)

TL: São Paulo de Olivença [Brazil]. **Types**: **ZMHU**: **ST**♂: "Lesbia Stgr.//Origin//S. Paulo Amaz. Sup Hhnl//Syntype"; **BMNH**(T): **ST**?♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//51//A. lesbia St. "Type" Pebas//Adelpha attica Feld. Godman-Salvin Coll. 1916.-4.//Pebas Upp. Amaz. ex Staudinger//Pebas Hhl//Pebas E. Peru Hahnel//♂//Origin//Paratype//Syntype" [both examined]

=*Adelpha oronoco* Weeks (1906: 76)

TL: Suapure, Venezuela. **Types**: **MCZ**: **ST**♂: "Adelpha oronoco Desc. Can. Ent. Vol. XXXVII #3 Sent to Blake Feb. 4 Sketch to Meisel Dec. 08 Plate XIV fig//Suapure Venezuela//A G Weeks Collection//This specimen photographed for G. Lamas by AS. Aiello Jan 1981// Syntypus ♂//Very near aethalia Feld. not in BM//near A. thesprotia or cocla [sic]//the nearest thing to this I can find is A. erymanthis" [examined]

=*Adelpha attica carmela* Fruhstorfer (1915: 529)

TL: Colombia. **Types**: **BMNH**(T): **LT**♂: "Fruhstorfer Coll. B.M. 1937-285//attica carmela Fruhst.//Columbien ex Coll. H. Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha attica serita* Fruhstorfer (1915: 529)

TL: Province of Sara, Bolivia. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//attica serita Fruhst.//Prov. Sara Dept. S. Cruz de la Sierra, IV to beg. V. 04 (J. Steinbach)//TYPE//Type//Syntype"; **BMNH**(R): **ST**♂: "TYPE//Prov. Sara Dept. S. Cruz de la Sierra end II to beg. IV. 04 (J. Steinbach)//serita Fruhst.//attica valentina Fruhst." [both examined]

Adelpha attica Fldr., Kirby (1871)

Identification, taxonomy and variation:

Adelpha attica attica is distinguished from *A. a. hemileuca* under that subspecies. There is slight variation in the width of the white DHW postdiscal band and the amount of yellowish coloration in cells M_1-Rs and Rs-Sc+R_1. I have examined two specimens, one lacking locality data and the other from Panama, both in the USNM, that are transitional in wing pattern to *A. a. hemileuca*; the DHW pattern is typical of the nominate subspecies, but the DFW has a reduced orange subapical spot in cell M_2-M_1 and a broader orange postdiscal band.

Felder & Felder (1867) described this species based on an unspecified number of male specimens in their collection collected by Lindig and labelled "Bogotá". They compared it with *A.* (*malea*) *aethalia*, but stated that the DHW differed in having orange in the anterior part of the postdiscal band, and went on to clearly describe the distinctive ventral surface. A syntype male is in the BMNH(R), in addition to three further males from the Felders' collection also labelled "Bogotá Lindig". Staudinger (1886), however, appears to have been ignorant of their description when he described *Adelpha lesbia* based on an unspecified number of specimens from São Paulo de Olivença in Brazil. He also compared his specimens with *A.* (*malea*) *aethalia*, which he misidentified as *A. erotia*. I have examined a syntype in the ZMHU and a putative syntype in the BMNH, but since the latter is from Pebas, a locality not mentioned in the original description, its validity is suspect. Nevertheless, both specimens are clearly typical *A. attica attica* and Hall (1938) synonymised the two names. Like

Staudinger, Weeks (1906) was also unaware of the true identity of *attica*, and he described a Venezuelan specimen or specimens as *Adelpha oronoco*, later figuring both surfaces, probably of the MCZ syntype (Weeks, 1911: pl. XIV). This specimen bears several labels witnessing the attempts of various lepidopterists to identify it prior to its description; *A. cocala*, *A. thesprotia*, *A.* (*malea*) *aethalia* and *A. erymanthis* were all suggested. The syntype specimen in the MCZ, however, shows it to be a synonym of *A. attica*, where Hall (1938) placed the name. Fruhstorfer (1915) was unable to identify Weeks' *oronoco*, but placed *lesbia* as a subspecies of *A. attica* and went on to describe two further subspecies, *carmela* and *serita*. The former was based on a specimen from Colombia lacking exact locality data, but presumed by Fruhstorfer (1915) to be from Río Dagua. The description and the lectotype in the BMNH, however, show this supposition to be incorrect, since *A. attica hemileuca* occurs there (see Willmott & Hall (1999) for a discussion of the identity of *carmela*). The lectotype specimen (Fig. 93a,b) differs little from typical *A. attica* and the name was synonymised by Hall (1938). *Adelpha a. serita* was based on specimens collected in the Province of Sara in Bolivia from the end of February to the beginning of April, supposedly differing in having narrower dorsal postdiscal bands, and was figured on plate 110Aa (Fruhstorfer, 1920). There are no consistent differences between the syntype specimens, or specimens from the same locality in the BMNH, and typical *A. attica*, and Hall (1938) synonymised the name with *attica*.

Range: This subspecies occurs east of the Andes from southern Venezuela to Bolivia, and is represented by several specimens from the central Amazon in Brazil. There is a single specimen in the USNM from Panama which is transitional to *A. a. hemileuca*, but I have seen no further reliably labelled specimens from west of the Andes.

Habitat and adult ecology: This subspecies is relatively rare in collections, but I have found it to be common in primary lowland rain forest up to 1000m in eastern Ecuador. Although it flies throughout the year, it is most abundant in the wet season and early dry season, from May to December. Females are very rare in collections and I have never seen any in the field, but males may be readily attracted to traps baited with rotting fish in forest light gaps, particularly along ridge tops.

Specimens examined (88♂, 2♀): † - trans. to *A. a. hemileuca*.
PANAMA (1♀): *Darién*: "Darien, Caña 900m 25/7/81 G.B. Small" 1♀† USNM. **VENEZUELA** (5♂): *Amazonas*: Mt. Duida 1♂ AMNH; *Bolívar*: Suapure 4♂ MCZ. **COLOMBIA** (17♂): "*Boyacá*": Muzo 2♂ AME-error; *Cundinamarca*: Bogotá 4♂ BMNH; Région du Bogotá 1♂ BMNH; *Meta*: Villavicencio Feb. 4♂ AME, 2♂ AMNH; Villavicencio-Mt. Redondo Mar.-Apr. 1♂ BMNH; *Not located*: no specific locality 2♂ AMNH, 1♂ BMNH. **ECUADOR** (15♂): *Napo*: Apuya 600m Aug. Oct. 1♂ MJP, 2♂ KWJH; Chichicorrumi Oct. 1♂ MJP; Coca, 30 km S.W., Apr. 1♂ MJP; Finca San Carlo 600m Aug. 1♂ KWJH; Talag Sep. 1♂ DAT; *Pastaza*: Puyo-Tena rd., km 25, 950m Oct. 1♂ MJP; Sarayacu 1♂ USNM; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Dec. 1♂ PJD; *Not located*: Carripos 1♂ USNM; no specific locality 1♂ BMB, 1♂ MCZ, 2♂ JFL. **PERU** (40♂): *Amazonas*: Chachapoyas 1♂ BMNH; *Huánuco*: Tingo María Apr.-Jun. Aug. 4♂ AME, 1♂ USNM; Tournavista 1♂ AME; *Junín*: Chanchamayo 900m Mar. 2♂ USNM; La Merced 2500' 2♂ BMNH; Río Colorado 2000' Mar. Apr. 1♂ BMNH; Río Ipoki May 1♂ MUSM; Satipo 750m Jun. Dec. 6♂ AMNH, 2♂ MUSM, 1♂ AME; *Loreto*: Cocha Shinguito, Río Samiria 130m Jun. 1♂ MUSM; Iquitos 1♂ ZMHU, 1♂ USNM; Loreto-Balsapuerto 220m Feb. 1♂ MUSM; Pebas 1♂ ZMHU; Río Sucusari 140m Sep. 2♂ MUSM; *Madre de Dios*: Boca Río La Torre 300m Sep. 1♂ MUSM; Pakitza 400m Nov. 1♂ MUSM; *Puno*: Río Távara 600m Jul. 1♂ MUSM; *San Martín*: Jepelacio 3♂ AMNH; Juanjuí 2♂ MCZ; *Not located*: Huallaga 1♂ ZMHU, 1♂ AMNH; no specific locality 1♂ USNM. **BOLIVIA** (23♂): *El Beni*: Cachuela Esperanza Sep. 1♂ AME; Reyes 1♂ BMNH; *La Paz*: Caranavi 700m Sep. 1♂ KWJH; *Santa Cruz*: Azuzaqui 400m Mar. 1♂ AME; Buenavista 400m Mar. Apr. 3♂ MUSM, 2♂ AME; Prov. Sara 8♂ BMNH; Río Juntas 300m 1♂ ZMHU; Santa Cruz 1♂ USNM; *Not located*: no specific locality 4♂ AMNH. **BRAZIL** (11♂): *Amazonas*: São Paulo de Olivença 1♂ BMNH, 4♂ ZMHU, 1♂ AME; *Pará*: Itaituba 1♂ ZMHU, 3♂ BMB; *Not located*: L. Amazon 1♂ BMB. **COUNTRY UNKNOWN** (3♂, 1♀): Amazon 1♀ BMNH, 1♂ USNM, 1♂ MCZ; no specific locality 1♂† USNM.

Additional locality data: **ECUADOR**: *Napo*: Apuya Feb. Jul. Sep. Dec.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Jul. Sep. Dec.; El Capricho Oct.; Finca San Carlo Sep.; Pimpilala Sep.; Río Yuturi Oct.; Satzayacu Sep.; Tiputini Biodiversity Station 300m Aug.; Yasuní 300m Jul. Aug.; *Pastaza*: Pitirishca 1000m Jul.; *Sucumbíos*: Pañacocha Oct. (Willmott & Hall, sight records).

Adelpha attica hemileuca Willmott & Hall, 1999

Figs. **93c,d**; 184a,b; *307*

Adelpha attica hemileuca Willmott & Hall (1999: 7, fig. 5a,b, 15a,b)

TL: Juntas, Río Tamaná, Río San Juan, Chocó, Colombia. **Types**: **BMNH**(M): **HT**♂: Juntas, 400' Feb.; COLOMBIA: **PT**♂: "Santa-Fé de Bogotá. Acq. Donckier; 1907//Ex Oberthür Coll. Brit. Mus. 1927-3"; **PT**♂: "Colombia. 1898. Purch. from Rosenberg. 99-268."; **BMNH**(R): 2**PT**♂: "Bogotá coll. 1898"; **PT**♂: "Bogotá"; ECUADOR: **KWJH**: **PT**♂: San Miguel, Río San Miguel, Esmeraldas, 100m, 11 Jun. 1994, *leg.* J. P. W. Hall; **PT**♂: ridge to east of Río Baboso, nr. Lita, Carchi, 900m, 26 Aug. 1996, *leg.* K. R. Willmott; **MECN**: **PT**♂: same data as preceding [all examined]

Adelpha attica Fldr., Hall (1938) in part; *Adelpha attica carmela* Fruhst., D'Abrera (1987) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by the orange DFW postdiscal band being slightly darker and broader, particularly the upper portion, with less of a "notch" at the basal edge at vein M_3, while the orange DFW subapical spots are reduced. On the DHW, the postdiscal band is entirely orange from the costa to vein M_2, rather than just having pale orange scaling at the edges and tinting the band, and it is constricted so as to be almost broken at vein M_2, tapering to a point in cell 2A-Cu_2. The postdiscal band on the VFW is obscured throughout by sparse orange scales, while the inner submarginal series is present in cell Cu_1-M_3 as a faint silvery grey dash. The VFW is darker, with a slightly purplish brown ground colour, and the inner postdiscal series is a better defined, faint pale greyish line. *Adelpha a. hemileuca* shows little variation in the six Colombian specimens examined. Ecuadorian specimens differ slightly from the holotype on the DFW in having almost no trace of a subapical spot in cell M_2-M_1 and a slightly broader orange postdiscal band anterior to vein M_3. They also have slightly more white scaling on the ventral surface in the inner submarginal series of the forewing and the inner postdiscal series of the hindwing. These differences, however, are too minor to warrant taxonomic recognition.

Adelpha attica hemileuca is represented by several specimens in the BMNH but was thought by Hall (1938) to be simply a form of the nominate subspecies, occurring with typical *A. attica* in Colombia. This was presumably due to a lack of accurate locality data as all *A. attica* known from the Chocó region of Colombia and northwestern Ecuador are typical *A. a. hemileuca*, while all specimens from east of the Andes show no significant variation. A specimen was also figured by D'Abrera (1987) as "*A. attica carmela*", but this name is a synonym of the nominate subspecies (Willmott & Hall, 1999).

Range: *Adelpha a. hemileuca* is restricted to the base of the western Andes in northern Ecuador and western Colombia, the Chocó endemic centre. A single specimen transitional in wing pattern to the nominate subspecies is known from Panama.

Habitat and adult ecology: This subspecies is rare and occurs in lowland rain forest from 100-900m. I have observed small groups of males along a 15m wide ridge top path near Lita, in western Ecuador, perching on isolated bushes 4-5m above the ground from 1-1.30pm in bright sun. Males patrolled an area of 20-30m along the ridge, with a slow, gliding flight with the wings pointed slightly downwards. Jason Hall (pers. comm.) also captured a single male in a trap baited with rotting fish in selectively logged, flat lowland rainforest. All of the specimens known from Ecuador have been collected at the end of the wet season, from June to August.

Specimens examined (9♂):
COLOMBIA (6♂): *Chocó*: Juntas, Río Tamaná, Río San Juan 400' Feb. 1♂ BMNH; *Cundinamarca*: Bogotá 4♂ BMNH; *Not located*: no specific locality 1♂ BMNH. **ECUADOR** (3♂): *Carchi*: Lita, ridge east of Río Baboso 900m Aug. 1♂ KWJH, 1♂ MECN; *Esmeraldas*: San Miguel, Río San Miguel 100m Jun. 1♂ KWJH.

Adelpha leuceria (Druce, 1874)

Figs. **94**; 122; 123; 185; 262; *307*

Identification, taxonomy and variation:

Adelpha leuceria is most closely related and most similar in wing pattern to the smaller species *A. leucerioides*, and is distinguished from Mexico to Honduras (encompassing the entire known range of *A. leucerioides*) by the following characters: the pale postdiscal band on the VFW is bordered distally by a red-brown line in cell 2A-Cu_2, with the inner/outer postdiscal series visible as a pale marking just distal of this line, the basal edge of the DFW postdiscal band is smoothly curving rather than stepped at vein M_3, the hindwings are more elongated and triangular rather than squarish, the outer postdiscal series on the VHW is an approximately uniform, pale greyish line, rather than consisting of large, silvery, scalloped spots in cells M_1-Rs and Rs-$Sc+R_1$, the orange-brown band bordering the distal edge of the pale VHW postdiscal band is much thicker, and the ventral colour is more orange-brown than reddish brown. Costa Rican and Panamanian specimens of *A. leuceria* differ from specimens from Honduras to Mexico in several respects, discussed below under *A. l. leuceria*, but share the following characters with typical *A. leuceria* that distinguish them from *A. leucerioides*: they are large in size, with an elongate, triangular hindwing, the outer postdiscal series on the VHW is even more uniform in colour, without even being slightly paler in cells M_1-Rs and Rs-$Sc+R_1$, and there is no "step" at the basal edge of the DFW postdiscal band at vein M_3. The uniformly orange DHW postdiscal band, large size and pointed wing shape, particularly the hindwing which is strongly dentate, pronounced orange subapical spot in cell M_2-M_1 on the DFW, which is distally displaced with respect to the distal margin of the orange band in cells Cu_2-M_2, in combination with several ventral wing pattern characters (see below), distinguish this species from all other superficially similar species. There is some variation in the width of the postdiscal bands and orange DFW subapical spots, in addition to the ground colour of the ventral surface, and two subspecies are recognised.

Apart from *A. leucerioides*, this species is superficially similar to *A. ethelda ethelda* and the eastern Cordillera de Mérida subspecies of several otherwise easily distinguished species, including *A. malea*. Fruhstorfer (1915) associated *A. leuceria* with both *A. ethelda ethelda* and *A. malea malea*, but while the latter may be relatively closely related, the former is not, and the similar dorsal wing pattern is produced by different pattern elements. The sister species of *A. leuceria* and *A. leucerioides* may be *A. erymanthis*, which has a very similar wing shape, distally displaced orange subapical spot in cell M_2-M_1 on the DFW, and a ventral surface almost identical to that of this species, including the following notable characters: both postdiscal series on the VFW are completely fused, with these being represented in cell Cu_2-Cu_1 as a small, pale spot or entirely absent, the inner postdiscal series is typically separate from the postdiscal band, the inner submarginal series is strongly displaced basally in cells Cu_1-M_3 and M_3-M_2 to parallel the distal edge of the postdiscal series, the silver-grey spot of the inner submarginal series is basally displaced in cell M_3-M_2 on the VHW, the outer postdiscal series on the VHW are almost entirely replaced by an indistinct red-brown line, and the area between the VHW postdiscal series is noticeably darker than the remainder of the wing. The male genitalia of the two species are also very similar, with the valvae lacking distal spines and having pronounced dorsal and ventral medial lobes. However, the female genitalia of *A. erymanthis* differ from those of *A. leuceria* in lacking sclerotised bands on the corpus bursae, placing it in the *A. cocala* group; it is unclear whether the ventral wing pattern represents convergence or whether the sclerotised bands have been lost in *A. erymanthis* independent of the *A. cocala* group, or secondarily gained in *A. leuceria/leucerioides*. The larvae are similar in several respects to *A. cocala* and relatives, but unfortunately the early stages of other potentially closely related species are unknown. The distally displaced orange DFW subapical spots, the ventral wing pattern and the separate postdiscal series and band on the VFW of *A. leuceria* are similar to *A. boeotia*, but the male genitalia are rather distinct, and the relationships of this taxon and *A. leucerioides* to other members of the genus remain to be established.

Range and status: Mexico to western Ecuador. Local and uncommon to rare in premontane rain forest from 100-2000m.

Specimens examined: 131 (63♂, 68♀)

Adelpha leuceria leuceria (Druce, 1874)

Figs. **94a,b**; 122; 123a-c; 185a,b; 262a,b; *307*

Heterochroa leuceria Druce (1874: 286)

TL: Río Polochic Valley, Guatemala. **Types**: **BMNH**(T): **ST**♀: "B.C.A. Lep. Rhop. Adelpha leuceria Druce Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9813 Heterochroa leuceria ♀ Druce//Type. sp. figured//H. leuceria type H. Druce//♀//Polochic Valley Guatemala F.D.G. & O.S.//Polochic Hague//Type H.T.//Syntype" [examined]

Adelpha leuceria Druce, Kirby (1877), DeVries (1987); *Limenitis (Adelpha) leuceria* Druce, Ross (1976) (probably *A. leucerioides*)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. l. juanna* on the dorsal surface by the much narrower upper postdiscal band on the forewing, which has the veins crossing it lined with dark brown, by the much larger orange subapical spots, and on the ventral surface by the paler, more orange-brown ground colour. The postdiscal bands on both wings are narrower, and the orange-brown line bordering the distal edge of the hindwing postdiscal band is broader. There is slight variation in the size of the orange DFW subapical spots, and the orange DHW postdiscal band may or may not be fused to the orange tornal spot. Specimens from Costa Rica and Panama differ consistently in wing pattern from those from Honduras to Mexico in the following respects: the ventral surface is paler, more orange-brown; the postdiscal series on the VFW are fused almost completely with the postdiscal band in cell Cu_1-M_3, and to some extent in cell M_3-M_2, whereas typical *A. leuceria* has the series and band clearly separated by a solid, red-brown line; the orange-brown line distal of the white

VHW postdiscal band is much thinner; and the orange-brown colouring bordering the distal edge of the white postdiscal band on the VFW does not extend into cell 2A-Cu$_2$. Material from Nicaragua, or additional specimens, may well show these differences to be consistent and to merit subspecific recognition. Since I only became aware of these differences relatively recently, I am unable to say to which of these phenotypes belong specimens without locality data in museums visited earlier in the study.

Druce (1874) described this species from an unspecified number of male specimens in the collection of Salvin and Godman, from Río Polochic valley in Guatemala, collected by Hague. The syntype in the BMNH, although a female, otherwise corresponds well with the original description.

Range: Mexico to eastern Panama, though specimens from Costa Rica and Panama may represent a distinct subspecies.

Immature stages: Alberto Muyshondt (pers. comm.) reared this species in El Salvador, and I have examined black and white photographs of several instars and a colour photograph of the pupa (Figs. 122, 123a-c). It should be noted that there is a very slight element of doubt as to whether these early stages do belong to *A. leuceria*, but they match no other species that has been reared to date.

Fig. 123. Fifth instar of *A. leuceria* (El Salvador -A. Muyshondt). **a**: frontal view of head capsule; **b**: lateral view; **c**: dorsal view.

Early instars are mottled with dark colours, except for segments A5 and A6, which are paler, and the whole body is speckled with whitish warts. There are several distinctive, irregular, pale spots on the sides of segments A1-3 and A7-8. Only the subdorsal scoli on segments T2, A2, A7 and A8 are relatively well developed, being dark in colour, thick, and bearing short, thick, tapering lateral spines. The last instar (Fig. 123a-c) has similar body coloration, except for having broad white lateral stripes that almost fuse to form a band on the sides of segments A4-6. The subdorsal scoli on T2, A2 and A7 are well-developed, thick, with short, tapering lateral spines, curved anteriorly on T2 and directed posteriorly on A2 and A7, similar to those of *A. cocala*. The subdorsal scolus on T3 is short and thinner, with few lateral spines, those on A3-4 are also short with only three terminal spines, while that on A8 is short and club-shaped, terminating in a dense ball of spines. The scoli on segments T1, A1, A5-6, and A9 are very reduced, or absent, while that on A10 is short and stubby, with short, thick terminal spines. Lateral scoli are reduced or absent throughout. The head capsule is uniformly brown, except for paler vertical stripes through chalazae a1 and a3, and relatively free of setae. All anterior chalazae are present; in the medial row, m1 is pronounced and darkly coloured, m2 reduced to a small bump, and m3 and m4 of average size and pale. All posterior chalazae are of average size and pale in coloration. The pronounced, dark m1 chalaza and reduced m2 chalaza are also both characters of *A. cocala* (See Aiello, 1984: figure 2). The pupa (Fig. 122) is also somewhat similar to *A. cocala* and *A. leucophthalma*, and is characterised by a particularly pointed thoracic dorsal projection on T2. The head horns in dorsal view are half-moon shaped and curve outwards.

Judging from the photographs that I have examined, the larval feeding behaviour is typical of the genus in that the leaf mid-rib is left intact.

Habitat and adult ecology: This subspecies is common in Mexico but becomes increasingly more scarce in the east of its range. In Mexico, it has been reported from evergreen and semi-deciduous premontane forest, from 100-1500m, where it flies throughout the year, but with a possible peak in abundance from May to October (de la Maza, 1987; de la Maza & de la Maza, 1993). I have collected males perching in a hill top light gap in primary forest near Puerto Eligio. Unusually for species in the genus, females outnumber males in collections. In Costa Rica, DeVries (1987) reports that the species, which may represent a distinct taxon, occurs locally from 900-2000m in cloud forest habitats, as rare, solitary individuals. Males perch high in the canopy and are active during the morning, most frequently in light gaps and on ridge tops, and occasionally along forest edges. Females appear to be rare in collections, in contrast to their unusual relative abundance in Mexico. DeVries (1987) also reports that males puddle at wet sand on sunny mornings, particularly at urine, and fly even in misty weather.

Specimens examined (57♂, 60♀): **?** - identification uncertain, possibly *A. leucerioides*.

Typical specimens (45♂, 55♀):

MEXICO (34♂, 43♀): *Chiapas*: Comitán Mar. May Jun. Aug. Sep. 5♂, 5♀ AME; El Zompopeno Aug. 1♂ AMNH; Guatimoc 1200m Aug. 1♂ AMNH; Ocozingo May 1♀ AME; Ocozocoautla Jan. 2♂ AMNH; Rancho Santa Ana 1200m Jun. 6♀ AMNH; San Jerónimo Dec. 1♂ AME; Selva Negra Apr. 1♂ MUSM; no specific locality 1♂, 10♀ AMNH; *Colima*: Colima Sep. 1♂ AMNH; *Guerrero*: Acahuizotla Jul. Aug. Oct. 1♂, 4♀ AME; Teotepec Nov. 2♀ AME; no specific locality (O. T. Baron) 1♂, 1♀ BMNH; *Oaxaca*: La Esperanza Jun.-Aug. 1♂ FSCA, 3♂, 1♀ AME; Oaxaca, 192 km from, 1♀ AMNH; Portillo del Rayón 1550m Oct. Nov. 1♀ AMNH, 1♂ AME; Puerto Eligio Sep. 1♂ AMNH; nr. Puerto Eligio 700m Jul. 1♂ KWJH; Sierra de Juárez Jul.-Aug. 1♀ AME; Valle Nacional Oct. 1♂ MUSM; Vista Hermosa Sep. Oct. 1♂ AMNH, 1♀ BMB; *San Luís Potosí*: Xilitla Nov. 1♀ AMNH; *Tamaulipas*: Gómez Farías 280-760m Sep. 1♂ AME; *Veracruz*: Coatepec 1♂, 2♀ USNM; Cuesta de Misantla 1♀ BMNH; El Vigía 900m Apr. Oct. 4♂, 1♀ AME, 1♂ MUSM; Jalapa 4600' Nov. 2♂ BMB; Orizaba Jul. Dec. 1♀ AME, 1♂ USNM; Presidio Sep. 1♀ AME; Santiago Tuxtla Oct. 1♀ AME; *Not located*: no specific locality 1♂, 1♀ BMNH. **GUATEMALA** (7♂, 6♀): *Alta Verapaz*: Baléu 1350m Aug. Sep. 2♂ AMNH, 1♀ AME; Polochic Valley 1♂, 1♀ BMNH; Tactic 1700m Nov. 1♂ AMNH; *Izabal*: Cayuga 2♀ USNM; *Quezaltenango*: Volcán Santa María 4-5000' 1♂ BMNH, 1♂ USNM, 1♂ BMB; *Not located*: no specific locality 1♀ ZMHU, 1♀ MCZ. **EL SALVADOR** (1♂, 4♀): *Santa Ana*: Cerro Miramundo Cloud Forest 2300m Feb. 1♂ AME; Cerro Verde 2000m Dec. 1♀ AME; Majaditas 1300m Oct. 1♀ AME; *Not located*: no specific locality 2♀ MNHN. **HONDURAS** (3♂, 2♀): *Cortés*: La Cumbre Jan. 1♂ BMNH; San Pedro Sula 5500' Aug. 1♀**?** USNM, 1♂ BMNH; *Not located*: no specific locality 1♀ BMNH, 1♂ ZMHU. **NICARAGUA** (1♂): *Matagalpa*: Matagalpa Jul. 1♂ AMNH.

ssp. nov.? (11♂, 3♀):

COSTA RICA (4♂, 1♀): *Cartago*: Irazú 6-7000' 1♀ BMNH; *Heredia*: Río Sarapiquí 1300m Jun. 1♂ USNM; *San José*: Río Sucio 2♂ BMNH; *Not located*: no specific locality 1♂ BMNH. **PANAMA** (6♂, 2♀): *Chiriquí*: Chiriquí 1♀ BMNH, 2♂ ZMHU; Santa Clara 1500m Aug. 1♂ USNM; Cerro Colorado 1450m Aug. 2♂ USNM; *Darién*: Caña 900-1550m Apr. Jul. 1♂, 1♀ USNM.

ssp.? (1♂, 2♀):

COUNTRY UNKNOWN (1♂, 2♀): no specific locality 1♀ MCZ, 1♀ ZMHU, 1♂ USNM.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona; Sierra Madre (de la Maza & de la Maza, 1993); Ocuilpa; Santa Rosa; Soconusco; *Guerrero*: El Faisanal; *Oaxaca*: Metates; *Puebla*: Patla; *Veracruz*: Dos Amates (de la Maza, 1987);

Est. Biol. Los Tuxtlas (Raguso & Llorente, 1991); *Jalisco*: 6 mi. E. El Durazno Apr.; La Calera Nov.; Puerto Los Mazos May Jun. Nov. (Vargas *et al*., 1996). **NICARAGUA**: *Matagalpa*: Res. Biol. El Arenal 1400-1500m Jun. Nov. (Van den Berghe & Maes, 1999).

Adelpha leuceria juanna Grose-Smith, 1898 **stat. nov.**

Figs. **94c,d**; *307*

Adelpha juanna Grose-Smith (1898: 71)

TL: Valdivia, Colombia. **Types**: **BMNH**(T): **ST**♀: "Type//Presented by J.J. Joicey Esq. Brit. Mus. 1931-291//Juanna Gr.-Sm. Colombia Type//Ex Grose-Smith 1910//Valdevia Pratt -97//Type H.T.//Syntype" [examined]

Adelpha malea juanna Gr.-Sm., Fruhstorfer (1915)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate subspecies under that taxon. It is more similar to Costa Rican and Panamanian specimens than to those from Mexico to Honduras, but still differs from those in the smaller DFW and VFW subapical spots, the much darker ventral ground colour, the broader postdiscal bands, especially the upper VFW postdiscal band, and the very thin orange line at the distal edge of the VHW postdiscal band. There is some variation in the extent to which the postdiscal series and the postdiscal band are fused on the VFW; in some specimens they are entirely separated by an orange-brown line, in others, almost entirely fused. In the single female specimen known from Pichincha Province in Ecuador, the most southerly locality for this species, the wing pattern approaches that of the nominate subspecies. The DFW upper postdiscal band is narrower and the orange DFW subapical spots are larger, while the ground colour of the ventral surface is more reddish brown than dark brown. While this may possibly represent a distinct subspecies from central to southern Ecuador, since no further specimens are known there is insufficient evidence to regard it as a distinct taxon.

Grose-Smith (1898) described this taxon based on an unspecified number of male specimens collected by Pratt in Valdivia, and clearly noted all of the distinguishing features of the dorsal surface. The syntype in the BMNH is actually a female but otherwise agrees well with the description. Although Grose-Smith noted in the original description that the taxon was very close to *A. leuceria*, Fruhstorfer (1915) placed it as a subspecies of *Adelpha malea*, presumably based on the darker ventral coloration, the reduction of the solid red-brown line in the pale VFW postdiscal band and the thinner red-brown line bordering the distal edge of the VHW postdiscal band. However, since the taxon has all of the distinguishing characters of this species, I place it as a subspecies of *A. leuceria* (**stat. nov.**).

Range: This subspecies is known from the western slopes of the Cordillera Occidental in Colombia to northwestern Ecuador. It is also known from Colombia from a single specimen from Valdivia, at the northeastern tip of the Cordillera Central, and three females labelled "Bogotá". The latter may be mislabelled or may have been collected on the western slopes of the Cordillera Oriental.

Habitat and adult ecology: This subspecies is rare throughout its range, and appears to be restricted to primary premontane rain forest habitats from 100m to 1300m. I have found females to be equally as common as males in western Ecuador, and they may be attracted to rotting banana, while males are occasionally found in traps baited with rotting fish. Males may be regularly observed at tree fall light gaps on ridge tops in primary forest, where they perch on the tips of branches extending into the light gap during periods of bright sun. Perching sites are almost always in the subcanopy, up to 15m above the ground, and from these perches individuals vigorously chase males and other butterflies that enter the light gap. The subspecies has been collected throughout the year, but in my experience in western Ecuador it is most common in the wet season from March to August.

Specimens examined (6♂, 8♀):

COLOMBIA (5♂, 6♀): *Antioquia*: Valdivia 1♂ BMNH; *Chocó*: Río Habito 800m Nov. 1♀ JFL; *Cundinamarca*: Bogotá 1♀ BMNH, 1♀ BMB; Région du Bogotá 1♀ BMNH; *Valle del Cauca*: Río Garrapatos Apr. 1♂ ESM; Río Raposo 100m Feb. 1♂ LMC; Tatabro 100-200m Jan. Jul. 1♂ MHNUC, 1♂ JFL; Yatacué, Alto Anchicayá 750m Aug. 1♀ LMC; *Not located*: no specific locality 1♀ BMNH. **ECUADOR** (1♂, 2♀): *Esmeraldas*: El Durango Aug. 1♂ KWJH; La Punta, km 44 Lita-San Lorenzo rd. 300m Jun. 1♀ KWJH; *Pichincha*: Reserva Maquipucuna 1300m Aug. 1♀ KWJH.

Additional locality data: **ECUADOR**: *Carchi*: Lita, ridge east of Río Baboso Mar. Jul.; *Esmeraldas*: El Durango Jul.; Finca Doña Bella 400m Aug. (Willmott & Hall, sight records).

Adelpha leucerioides Beutelspacher, 1975

Figs. **95a,b**; 186a,b; 263a-c; *307*

Adelpha leucerioides Beutelspacher (1975: 34, fig. 4A,B, 5A, 6A,B, 7)

TL: Cerro El Vigía, Santiago Tuxtla, Veracruz, Mexico. **Types** (all Mexico): **UNAM**: **HT**♂: Cerro El Vigía 15 Jun. 1973, *leg.* Alberto Díaz Francés [original photograph examined]; 2**PT**♂, 3**PT**♀: Cerro El Vigía Jun. Jul.; **ADF**: 4**PT**♂, 4**PT**♀: Cerro El Vigía Jun. Jul. Aug. Sep.; **PT**♀: Tapalapa, Veracruz Aug.; **PT**♀: Popotepe, Veracruz Jun.; 3**PT**♂: Santa Rosa, Las Margaritas, Chiapas May; **RDM**: 4**PT**♂, 6**PT**♀: Cerro El Vigía Apr. Jun. Jul. Aug. Sep. [not examined]

Limenitis (Adelpha) leuceria Druce, Ross (1976) misid.?

Identification, taxonomy and variation:

This species is distinguished from *A. leuceria* under that account. Contrary to the original description, the orange DHW postdiscal band is variably joined to the orange tornal spot and this is not a reliable character to separate *A. leucerioides* and *A. leuceria*. The male genitalia of these two species are also essentially indistinguishable, and the differences in the originally illustrated male genitalia of the two species in the tegumen and aedeagus also represent individual variation. There is slight variation in the width of the orange dorsal postdiscal band, but none that merits subspecific recognition in the specimens that I have examined from either localities within Mexico (Veracruz, Guerrero, Chiapas), or Guatemala.

Beutelspacher (1975) described this species based on a series of 29 specimens, the great majority of which were collected in the Tuxtlas. I have examined the black and white photographs in the original description of a male and a female, which I assume are the holotype and a paratype, although this is not stated. The only character mentioned by Beutelspacher which is consistently different between *A. leucerioides* and *A. leuceria* is the size of specimens, but a number of additional wing pattern characters are listed above under *A. leuceria*. I initially regarded this taxon as a subspecies of *A. leuceria*, given the apparent lack of fundamental wing pattern or genitalic differences and apparently restricted range of *A. leucerioides* to the Tuxtlas and Veracruz. However, both *A. leucerioides* and *A. leuceria* seem to be sympatric over a large area of Mexico and possibly Guatemala, and the numerous slight differences between the two are constant, and I therefore treat them as distinct species. Although specimens of *A. leucerioides* are present in several collections, its great similarity to *A. leuceria* and the lack of accurate locality data presumably precluded its earlier description.

The wing pattern and male genitalia of *A. leucerioides* and *A. leuceria* scarcely differ and the two are clearly sister species. As discussed under *A. leuceria*, the next most closely related species may be *A. erymanthis*.

Range: This species has been recorded from several states within Mexico, on both the Pacific and Atlantic slopes, in Guerrero, Veracruz and Chiapas. I have also seen a single specimen from Guatemala, implying that it might be more widespread throughout Central America.

Habitat and adult ecology: This species is apparently locally common in Mexico, in premontane rain forest and cloud forest from 1000-2000m, where it has been recorded from June to September (de la Maza, 1987; de la Maza & de la Maza, 1993). Ross (1976) reports a species as "*leuceria*" from montane habitats in the Sierra de Tuxtla, from 600-1600m between March and September, which is probably this species. Individuals were common and rested on leaves from 2-4m above the ground along wide, sunny trails.

Specimens examined: 19 (10♂, 9♀)

MEXICO (10♂, 8♀): *Guerrero*: no specific locality (O. T. Baron) 2♂ BMNH; *Veracruz*: Cuesta de Misantla 2♂, 1♀ BMNH; El Vigía Apr. Aug. 3♂, 6♀ AME; Los Tuxtlas Aug. 1♂ AME; Santiago Tuxtla Sep. 1♂ AME; Sinanja 1♂ BMNH; *Not located*: no specific locality 1♀ BMNH. **GUATEMALA** (1♀): *Alta Verapaz*: Polochic Valley 1♀ BMNH.

Additional locality data: **MEXICO**: see type data above (Beutelspacher, 1975); *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona (de la Maza & de la Maza, 1993); *Guerrero*: El Faisanal (de la Maza, 1987).

Adelpha erymanthis Godman & Salvin, 1884

Figs. **96**; 187; 264; *308*

Identification, taxonomy and variation:

This species is distinguished from *A. boeotia* by the entirely fused postdiscal series on the VFW, particularly in cells M_2-M_1 and M_1-R_5, where they are clearly separate in the sympatric *A. b. oberthurii*. The red-brown line on the VFW separating the postdiscal series and postdiscal band is curved rather than straight (this line is sometimes visible only as sparse, darker scaling), and the outer submarginal series on the VFW, except in cell 2A-Cu_2, are typically reduced. The inner submarginal series are more pronounced, visible as two whitish dashes in cells M_1-Rs and Rs-Sc+R_1 on the VHW, and there is a noticeable dark brown band between the postdiscal series on the VHW. The prominent, distally displaced orange DFW subapical spot in cell M_2-M_1, and the dark brown to black band between the postdiscal series on the VHW, distinguish this species from most other similar species. *Adelpha sichaeus* and *A. hesterbergi* also differ in having the VHW inner postdiscal series replaced by a slightly paler brown line, the silver-grey submarginal spot in cell Cu_1-M_3 on the VFW reduced compared to that in cell Cu_2-Cu_1, or entirely absent, and the anterior silver-grey submarginal spot in cell 2A-Cu_2 on the VFW always longer than the posterior spot. The postdiscal series are fused in cell Cu_2-Cu_1 on the VFW, forming a single pale yellowish spot at the distal edge of the postdiscal band, instead of the two dashes present in *A. fabricia*, *A. malea*, *A. heraclea* and *A. capucinus* (the latter species may have only a single, distally displaced dash). There is geographic variation in the width, shape and placement of the postdiscal bands, the amount of white colouring in the DFW postdiscal band in cell 2A-Cu_2, and the presence or absence of orange scaling at the distal margin of the white DHW postdiscal band near the costa, and four subspecies are recognised, one of which is described here.

The male genitalia of this species are distinctive in lacking spines at the distal tip of the valvae, but are similar in this respect to those of *A. leuceria* and *A. sichaeus*, and *A. erymanthis* may be the sister species of the latter, if not the sister species to *A. leuceria/leucerioides*.

Range and status: Mexico (Oaxaca) to southwestern Ecuador, possibly in the central valleys of Colombia west of the Cordillera Oriental. Very rare and probably seasonal in premontane rain forest from 300-1600m, also reported from up to 2000m.

Specimens examined: 18 (8♂, 10♀)

Adelpha erymanthis erymanthis Godman & Salvin, 1884

Figs. **96a,b**; 187a,b; 264a,b; *308*

Adelpha erymanthis Godman & Salvin (1884: 302, pl. XXIX, figs. 5, 6)

TL: Chontales, Nicaragua; Irazú, Costa Rica. **Types**: **BMNH**(T): **ST**♀: "B.M. TYPE No. Rh. 9824 Adelpha erymanthis [♂]♀ G. & S.//B.C.A. Lep. Rhop. Adelpha erymanthis G. & S. Godman-Salvin Coll. 1916.-4.//4 91//not ♂ as stated//erymanthis upper & under//♀//Chontales Nicaragua T. Belt//Type H.T.//Syntype"; **BMNH**(M): **ST**♀: "Irazú, Costa Rica, Rogers//♀//Paratype//16 88//not ♂ as stated//B.C.A. Lep. Rhop. Adelpha erymanthis G. & S. Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9825 Adelpha erymanthis ♂ (♀) G. & S." [both examined]

Identification, taxonomy and variation:

The nominate subspecies is distinguished from remaining subspecies by having orange scaling at the distal edge of the white DHW postdiscal band near the costa. This character also distinguishes this subspecies from all similar species, with the exception of some forms of *A. erotia erotia*. In addition, *A. e. adstricta* also has a shorter white DHW postdiscal band, which terminates at vein Cu_2, the basal edge of the orange DFW band is smoothly curving instead of being sharply bent at vein M_3 and the distal edge is smoother, without being produced in cell M_3-M_2, the upper postdiscal band is more basally positioned so as to touch the postcellular bar on the VFW, the hindwing is more rounded and the inner submarginal series are broader. *Adelpha e. esperanza* has the DFW postdiscal band white in cell 2A-Cu_2, while *A. e. fortunata* has a much thinner orange DFW postdiscal band. The DFW band in three Mexican males of the nominate subspecies in the AME is thinner than typical, especially in cells 2A-Cu_2 and Cu_1-M_3, but it is still entirely orange to the DFW anal margin, with reduced orange scaling at the distal margin of the white DHW postdiscal band near the costa. The single Mexican male in the AMNH is typical except that the basal edge of the orange DFW band is indented at each vein, as in *A. e. esperanza*, and the white DHW postdiscal band is narrower.

Godman & Salvin (1884) described this species based on two specimens in their collection from Chontales (Nicaragua), collected by Belt, and Irazú (Costa Rica), collected by Rogers. They also figured the dorsal and ventral surface, and described the orange scaling at the distal margin of the white DHW postdiscal band near the costa. The two syntype specimens are in the BMNH, except that both are female, contrary to the claims of the original description and DeVries (1987).

Range: Eastern Mexico (Chiapas) to central Panama.

Habitat and adult ecology: This taxon is clearly very rare in the field, and appears to be restricted to mountain foothills throughout its range. In specimens that I have examined, the only recorded height of collection is 500-750m, although DeVries (1987) reports it up to 2000m. DeVries (1987) also reports that he encountered only a single individual during his time in Costa Rica, which was flying along a ridge top above the forest canopy. I observed the species in Costa Rica at the bridge over the Río Angel near Cariblanco, where males perched on bushes overhanging the river around 10m above the water, making frequent sorties out over the water course (Hall & Willmott, 1993). The recording of this otherwise rare species at two different sites within a couple of weeks in August-September suggests that the species may be more common in the wet season (Hall & Willmott, 1993).

Specimens examined (7♂, 4♀):
MEXICO (4♂): *Chiapas*: Comitán Jun. Sep. 3♂ AME; no specific locality 1♂ AMNH. **NICARAGUA** (1♀): *Chontales*: Chontales 1♀ BMNH. **COSTA RICA** (3♂, 2♀): *Alajuela*: Río Angel, nr. Cariblanco 750m Aug. 2♂ KWJH; *Cartago*: Irazú 1♀ BMNH; *San José*: Carrillo Feb. 1♀ BMNH; Río Sucio 500m Sep. 1♂ KWJH. **PANAMA** (1♀): *Colón*: Colón, Santa Rita ridge G.B. Small Jan. 1♀ USNM.
Additional locality data: **COSTA RICA**: *Alajuela*: Volcán Poás (DeVries, 1987).

Adelpha erymanthis esperanza Balcázar & Willmott, in press

Figs. **96c,d**; *308*

Adelpha erymanthis esperanza Balcázar & Willmott (In press)
TL: La Esperanza, Oaxaca, Mexico. **Types**: **CNIN**: **HT**♀: *Oaxaca*: Santiago Comaltepec, La Esperanza, Sierra de Juárez, 17°37’45”N, 96°22’5”W, 1600m, Sep. 1976, *leg.* A. Díaz Francés – CNIN LEP 066691 [photograph examined]; 2**PT**♀: same data as HT except Jul. 1976 and Aug. 1976, CNIN LEP 066690 & 066692 [not examined]; **AME**: **PT**♀: Santiago Comaltepec, Puerto Eligio, 17º 42’19”N, 96º 18’25”W, 1 Nov. 1961, *leg.* T. Escalante, Allyn Museum Photo No. 071377-9-10 [examined] NB - latter also PT of *jacquelinae* (= *A. boeotia oberthurii*)

Identification, taxonomy and variation: This subspecies is most similar to the nominate, but is distinguished from it by lacking the orange at the distal edge of the white DHW postdiscal band, and by having the postdiscal band on the DFW white in cell 2A-Cu$_2$. The latter character also distinguishes it from other subspecies.

This taxon is known from four female specimens, which show little variation in wing pattern and all differ consistently from both male and female specimens throughout the range of the nominate subspecies. One paratype specimen is also a paratype of *A. jacquelinae* (Fig. 96c,d), a synonym of *A. boeotia oberthurii*, and the characters that distinguish this taxon from *A. boeotia* and unite it with *A. e. erymanthis* include the fused postdiscal series on the VFW, particularly in cells M$_2$-M$_1$ and M$_1$-R$_5$ where they are clearly separate in *A. b. oberthurii*, the curved rather than straight red-brown line dividing the postdiscal series and postdiscal band, the absence of the outer submarginal series except in cell 2A-Cu$_2$ on the VFW, the pronounced whitish dashes of the inner submarginal series in cells M$_1$-Rs and Rs-Sc+R$_1$ on the VHW and the dark brown area between the postdiscal series on the VHW.

Range: This subspecies is known to date, and probably endemic to, the Sierra de Juárez mountain range in central Mexico, presumably isolated from neighbouring populations of the nominate subspecies in Chiapas by the lowlands of the Isthmus de Tehuantepec. All recorded specimens are from the Atlantic slope.

Habitat and adult ecology: Nothing has been reported on the habitat or behaviour of this rare subspecies, and only females are known in collections. Male behaviour is presumably similar to that of the nominate subspecies (see above). Specimens have been collected from August to October, from 600-1600m in premontane rainforest habitats.

Specimens examined (2♀):
MEXICO (2♀): *Oaxaca*: La Esperanza 1600m Sep. 1♀ CNIN; Puerto Eligio [600m] Oct. 1♀ AME.

Adelpha erymanthis adstricta Fruhstorfer, 1915

Figs. **96e,f**; *308*

Adelpha erymanthis adstricta Fruhstorfer (1915: 518)
TL: Colombia. **Types**: **MHNG**: **HT**♀: no data available, presumably Colombia [photograph examined]

Identification, taxonomy and variation:

Adelpha e. adstricta is distinguished from the nominate and *A. e. fortunata* under those subspecies accounts. There is little variation in the three specimens examined.

Fruhstorfer (1915) showed uncommon perception in describing this taxon as a subspecies of *A. erymanthis*, based on a single specimen in the Geneva Museum from Colombia. He mentioned the straighter basal edge of the orange DFW band and the reduced white DHW postdiscal band, which terminates at vein Cu$_2$. I have examined a photograph, courtesy of Dr. Löbl, of the dorsal surface of the unique female specimen of *A. erymanthis* in MHNG, presumably the holotype of *adstricta*. Although I have been unable to examine the label data, it closely matches the original description and additional female specimens in the USNM, which are clearly conspecific with *A. erymanthis* from the ventral wing pattern.

Range: None of the specimens of this subspecies that I have examined have precise locality data, and only the holotype appears to be reliably labelled, from Colombia. The similarity of the dorsal surface to *Adelpha zina zina* and *Adelpha justina justina* suggests that this subspecies may be involved in mimicry with either or both of these taxa. This suggests that the subspecies probably occurs within the Colombian Cordilleras Occidental, Central and Oriental, but almost certainly not on the eastern slopes of the latter, and therefore not in the eastern Andes, where no similar *A. zina* or *A. justina* are known to fly. I therefore regard the single Peruvian specimen as mislabelled, while the supposed Ecuadorian specimen is also certainly mislabelled. I have been unable to find the label locality of the latter specimen, “Río Ayada vic.”, or alternative spellings, in any gazetteers or published lists of collecting localities within Ecuador or Colombia. The collector of the specimen is also unknown. However, specimens of other taxa in the USNM with similar labels, *Adelpha salmoneus emilia*, *A. serpa celerio*, and the nymphaline *Eresia ithomioides*, are typical of the Cauca valley in Colombia, where this subspecies probably flies.

Habitat and adult ecology: Nothing is known of the biology of this very rare subspecies.

Specimens examined (3♀):
COLOMBIA (1♀): no specific locality 1♀ MHNG. “**ECUADOR**” (1♀): *Not located*: “Río Ayada vic. Dec. 3, 1984” 1♀ USNM-error. “**PERU**” (1♀): *Not located*: “Peru col. Wm. Schaus” 1♀ USNM-error.

Adelpha erymanthis fortunata Willmott, **ssp. nov.**

Figs. **96g,h**; *308*

Description and diagnosis: FW length of HT 29mm. Both sexes of this subspecies are distinguished from *A. erymanthis adstricta* by the white DHW postdiscal band extending into the middle of cell 2A-Cu$_2$, instead of ending at vein Cu$_2$, and by the much narrower and straighter orange DFW postdiscal band, of which the upper portion is noticeably displaced distally on the VFW, instead of touching the postcellular bar as in *A. e. adstricta*. It is also distinguished from the nominate subspecies by the narrower orange DFW postdiscal band, in addition to the lack of orange scaling at the distal edge of the white DHW postdiscal band at the costa. The male genitalia do not differ from those of the nominate subspecies.

Types: ***Holotype*** ♂: ECUADOR: *Guayas*: “Bucay//Ecuador G.H.H. Tate”; in the AMNH. ***Paratype*** ♀: ECUADOR: *Imbabura*: c. km 6 Lita-Ibarra rd., Cachaco, ridge to south, 1300m, 13 Jul. 1999, *leg.* K. R. Willmott; in the KWJH.

Etymology: The subspecies name is derived from the Latin for “fortunate”, given the timeliness of capture of the paratype, which established that the west Ecuadorian phenotype was stable throughout that region and not sexually dimorphic.

Taxonomy and variation: Initially (Willmott, 1999) I had intended not to name this phenotype, given that I had examined only a single male specimen and the fact that there appeared to be a female specimen of *A. erymanthis adstricta* from western Ecuador. However, the recent fortuitous capture of a female specimen in northwestern Ecuador confirms that the diagnostic wing pattern characters of the male phenotype are stable throughout western Ecuador, and that the reputedly Ecuadorian female specimen of *A. e. adstricta*, in the USNM, is certainly mislabelled. This new taxon is clearly very distinct from *A. e. adstricta*, but closer to the nominate subspecies, suggesting that *A. e. adstricta* may inhabit one of the central Colombian valleys, while this subspecies, or a further undescribed subspecies, occurs along the western slopes of the Colombian Cordillera Occidental.

Range: This subspecies is known from only two specimens, but their collection localities indicate that it occurs throughout western Ecuador at least, and certainly as far north as the southwestern slopes of the Cordillera Occidental in Colombia.

Habitat and adult ecology: Clearly this taxon is very rare. Bucay lies at the foot of the west Andean slopes in premontane forest (Brown, 1941), while Cachaco lies in similar habitat. The female paratype was found resting along a path through open fields near the top of a ridge, around 100m from primary forest, in the middle of the morning.

Specimens examined (1♂, 1♀):
ECUADOR (1♂, 1♀): *Guayas*: "Bucay//Ecuador G.H.H. Tate" [300m] 1♂ AMNH; *Imbabura*: Cachaco 1200m Jul. 1♀ KWJH.

Adelpha sichaeus (Butler, 1866)

Figs. **97a,b**; 188a-c; 265a,b; *308*

Heterochroa sichaeus Butler (1866: 669, fig. 3)
TL: Bogotá [Colombia]. **Types**: **BMNH**(T): **ST**♂: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//57//B.M. TYPE No. Rh. 9826 Heterochroa sichaeus ♂ Butl.//H. sichaeus Butl. type//erotia var. Hew.// Bogotá//Type//Syntype" [examined]

=*Adelpha privata* Fruhstorfer (1913: pl. 106a; 1915: 517)
TL: [Ecuador]. **Types**: **BMNH**(T): **ST**♂: "sichaeus privata Fr.//Fruhstorfer Coll. B.M. 1937-285//Ecuador Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(R): **ST**♂: "TYPE//Coca Upp. R. Napo V.-VI. 1899 (W. Goodfellow)//sichaeus privata Fruhst.//R" [both examined]

=*Adelpha leucopetra* Fruhstorfer (1913: pl. 106a; 1915: 517) **stat. nov.**
TL: [Bolivia]. **Types**: **BMNH**(T): **ST**♂: "sichaeus leucopetra Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Bolivien Fruhstorfer//Type// Syntype"; **BMNH**(M): **ST**♂: "Coroico, Bolivia, May 1899//Joicey Bequest Brit. Mus. 1934-120//TYPE//Paratype"; **BNMH**(R): **ST**♂: "sichaeus leucopetra Fruhst.//La Oroya to Agualani, Carabaya, Oct. 1904 Wet s. (Ockenden)//R" [all examined]

=*Adelpha irisa* Fruhstorfer (1913: pl. 106a; 1915: 517) **syn. nov.**
TL: [Chanchamayo, Peru]. **Types**: **BMNH**(T): **ST**♂ (listed as the "type" by Fruhstorfer (1915)): "sichaeus irisa Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Chanch. Th.//Peru H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(R): **ST**♂: "leucopetra f. irisa Fruhst.//Pozuzo Huánuco 800-1000m (W. Hoffmanns)//R" [both examined]
Adelpha sichaeus Butl., Kirby (1871)

Identification, taxonomy and variation:

This species is most similar in wing pattern to *A. hesterbergi*, from which it differs in having a solid red-brown line cutting through the pale VFW postdiscal band, in addition to other characters discussed in the account of that species, including significant differences in the male genitalia. The prominent orange DFW subapical spot in cell M_2-M_1, the distal edge of which is aligned with the distal edge of the postdiscal band in cells Cu_2-M_2, the reduced upper postdiscal band on the DFW which is cut by dark brown veins, and the ventral surface, with its rich reddish and silver colours, the reduced silver-grey submarginal marking in cell Cu_1-M_3, and the two prominent silvery grey spots in the tornus, of which the anterior spot is twice the length of the posterior spot, distinguish this species from *A. erymanthis*. In addition to these characters, the dark brown band between the VHW postdiscal series and the entirely fused VFW postdiscal series separated from the pale postdiscal band by a solid, red-brown line, distinguish this species from other similar species. The width of the orange DFW postdiscal band and size of the subapical spots is quite variable, and generally both increase clinally from north to south, although there is also individual variation within each region.

Butler (1866) described and figured both surfaces of this species based on an unspecified number of specimens from Bogotá, and a syntype is in the BMNH. Fruhstorfer (1913) figured, and later placed as subspecies of *A. sichaeus*, three new taxa, *privata*, *irisa*, and *leucopetra*, based on specimens from Ecuador, Chanchamayo in Peru, and Bolivia, respectively (Fruhstorfer, 1915). I have examined types of all of these names in the BMNH. The orange DFW band of the syntype of *privata* in the BMNH(T), the specimen figured, is anomalously narrow, while the syntype of this taxon in the BMNH(R) has a band of typical width. The differences in the width of the dorsal postdiscal bands cited by Fruhstorfer (1915) as distinguishing *irisa* and *leucopetra* are apparent, but these are all minor differences subject to much individual and clinal variation. Hall (1938) retained *irisa* as a good subspecies, with which he synonymised *leucopetra*, while synonymising *privata* with *sichaeus*, but I regard all of Fruhstorfer's names as synonyms of the nominate subspecies (**syn. nov.**, **stat. nov.**).

The male genitalia of this species, which lack spines at the posterior tip of the valvae, in addition to several wing pattern characters, including the fused postdiscal series on the VFW which are entirely separate from the postdiscal band and the dark brown band between the VHW postdiscal series, are similar to those in *A. erymanthis*, which occurs allopatrically in similar habitats, and the two are probably close relatives.

Range: This species occurs from the southeastern Cordillera de Mérida in Venezuela to Bolivia. There is single record in the ESM from Río de la Miel, on the eastern slope of the Cordillera Central in Colombia, and two specimens in the BMNH labelled "Honda", in the Magdalena valley; both these records require confirmation, since the species is otherwise unknown west of the Andes.

Habitat and adult ecology: *Adelpha sichaeus* is not uncommon in most relatively undisturbed cloud forest habitats, from 600m at the foot of the Andes as high as 1950m, though it occurs most commonly from 1000-1300m. It is most frequently encountered along rivers and streams, where males may occasionally be seen perching around 10m above the ground in old light gaps. Solitary individuals may also be found in primary forest on ridge tops. Males are attracted to traps baited with rotting fish along forest edges or in light gaps, while the single female I have seen was flying in a small field near a river in the early afternoon.

Specimens examined: 146 (141♂, 5♀) † - melanic form, no white on DHW, reduced orange on DFW.
VENEZUELA (1♀): *Barinas*: Barinit-San Isidro Dec. 1♀ AFEN. **COLOMBIA** (19♂, 2♀): "*Caldas*": Río de la Miel Jun. 1♂ ESM-error?; *Cundinamarca*: Bogotá 1♂ BMNH, 1♂ USNM; env. Bogotá 3♂ BMNH; "*Guainía*": Río Inírida Oct. 1♀ ESM-error; *Meta*: Guayabetal Aug. 1♂ JFL; Villavicencio 1♂ AMNH; *Putumayo*: Candayua Sep. 1♂ JFL; "*Tolima*": Honda 2♂ BMNH-error?; *Not located*: no specific locality 4♂, 1♀ AMNH, 1♂ ZMHU, 2♂ BMB, 1♂ USNM. **ECUADOR** (36♂, 2♀): *Morona-Santiago*: Río Abanico 1600m Nov. 1♂ DAT; 2°-4°S, 78°W 875m Nov. Dec. 1♂ AMNH; *Napo*: Pimpilala 600m May 1♂ JFL; "Río Coca" Jun. 1♂ BMNH,

2♂ AME-error; Sarayacu, Río Urcusiqui 1400m Mar. 1♀ KWJH; *Pastaza*: Alpayacu 1♂ BMNH; Hda. Moravia, nr. Shell 1200m Feb. 1♂ KWJH; Río Llandia Sep. 1♂ MUSM; Shell Jun. Oct. 2♂ DAT; Veracruz 1000m Oct. 1♀ USNM; *Tungurahua*: Río Negro 1♂ BMNH; Río Topo Oct. 1♂ MJP; *Zamora-Chinchipe*: Quebrada Chorillos 1250m Apr. 1♂ KWJH; Río Numbala Aug. 1♂ BMNH; Zamora 1♂ BMB; *Not located*: middle Ecuador 1♂ AMNH; Oriente 16♂ AMNH; S. Ecuador 1♂ BMNH; no specific locality 2♂ BMNH. **PERU** (54♂): *Amazonas*: Piruro, 3 km N. Nueva Esperanza 1700m Mar. 1♂ MUSM; *Cuzco*: Buenos Aires, 20-28 km E., 1200-1500m Dec. 3♂ MUSM; Marcapata 1♂ MCZ; Quebrada Quitacalzón 1050m May 1♂ MUSM; Quincemil Nov. 1♂ MUSM; Vilcanota 3000m 1♂ ZMHU; *Huánuco*: Tingo María Mar. May 2♂ AME; *Junín*: Chanchamayo 6♂ BMNH, 1♂ ZMHU, 2♂ BMB; El Porvenir 900m 1♂ BMB; La Merced 2500' Oct. Nov. 2♂ BMNH; Perené R. Mar. 1♂ BMNH; *Pasco*: Pozuzo 800-1000m 2♂ BMNH; *Puno*: Carabaya 2500' Jun. 1♂ BMNH; Chaquimayo 25-3000' Apr. Jun.-Aug. Oct. 2♂ BMNH, 2♂ BMB; La Oroya 2500-3000' Nov.-Jan. Mar. Apr. Sep. 9♂ BMNH; La Oroya-Agualani Oct. 1♂ BMNH; Río Inambari 1000m Jul. 1♂ BMNH; Sto. Domingo 4500-6000' Jul. Aug. 3♂ BMNH; *San Martín*: Jepelacio 1♂ AMNH; *Not located*: Río Collamayo 1950m Sep. 1♂† MUSM; Río Huallaga 4♂ AMNH, 1♂ USNM; no specific locality 1♂ BMNH, 2♂ BMB, 2♂ USNM. **BOLIVIA** (32♂): *Cochabamba*: El Palmar 1100m Mar. 4♂ AME, 1♂ MUSM; 5 days N. Cochabamba Aug. 1♂ BMNH; Locotal 2600m 1♂ ZMHU; Yungas del Espírito Santo 1♂ BMNH; *La Paz*: Caranavi Oct. 1♂ JFL; Coroico 6500' May 2♂ MCZ, 2♂ BMNH, 2♂ ZMHU; La Paz May 1♂ MCZ; Río Songo 1200m 1♂ ZMHU; *Potosí*: Tupiza 1♂ AME; *Santa Cruz*: Río Negro 1♂ AME; *Not located*: Villa Vesta 1♂ BMNH; no specific locality 11♂ BMNH, 1♂ AMNH.

Additional locality data: **ECUADOR**: *Napo*: Río Achiyacu 600m Aug.; Tena-Loreto rd., km 49, Mar.; *Pastaza*: Shell Feb. Apr.; *Sucumbíos*: Río Palmar Nov.; *Tungurahua*: Río Cholo Hay Sep.; *Zamora-Chinchipe*: Quebrada Chorillos Nov.; Río Bombuscara May (Willmott & Hall, sight records).

Adelpha rothschildi Fruhstorfer, 1913

Figs. **98a,b**; 189a,b; 266a,b; *308*

Adelpha rothschildi Fruhstorfer (1913: pl. 106a; 1915: 528)

TL: [Paramba, Ecuador]. **Types**: **BMNH**(M): **ST**♂: "Rothschild Bequest B.M. 1939-1//Paramba 3500' v. '97 dry season (Rosenberg)//R//TYPE//Syntype" [examined]

=*Adelpha rothschildi pallida* Röber (1927: 281, fig. 3)

TL: West Colombia. **Types**: **BMNH**(M): **ST**♀: "Brit. Mus. 1928-508//Rothschildi pallida Type Röb.//West Colombien 500 meter März-Juni//TYPE//Type//Syntype"; **ST**♀: "Joicey Bequest Brit. Mus. 1934-120//Type P.T.//12. 28//West Colombien 500 meter März-Juni//COTYPE//Rothschildi pallida Type Röb." [both examined]

Identification, taxonomy and variation:

This species is distinguished from *A. levona* by several characters on the DFW, including the more pronounced orange postdiscal spots in cells M_2-M_1 and M_1-R_5, which are placed basal to rather than aligned with the basal edge of the orange spot in cell M_3-M_2, and the more smoothly curving line of postdiscal spots, which is slightly inclined from the anal margin to cell Cu_1-M_3 instead of parallel with the distal margin. The hindwing is more rounded, the VFW has a thin, well defined brown basal streak in the discal cell, the silver submarginal spot in cell Cu_1-M_3 is reduced or absent, two silvery grey spots of the outer submarginal series are visible in cell 2A-Cu_2, and on the VHW the silvery grey inner postdiscal series is much closer to the postdiscal band than to the silvery grey inner submarginal series, instead of approximately equidistant. *Adelpha rothschildi* is distinguished from other similar taxa, such as *A. salus emmeli*, by the fusion of the postdiscal series and the postdiscal band on the VFW, forming single reddish brown markings with a pale basal edge in each cell. There is little variation in the few specimens examined.

Fruhstorfer (1913) figured the dorsal surface of this species based on a single specimen from Paramba in western Ecuador, collected at 3500' in May of 1897, and stated that the type was in the Tring Museum (Fruhstorfer, 1915). The unique syntype specimen, collected by Rosenberg, is now in the BMNH(R). Röber (1927) described *pallida* based on two putative males in the collection of Niepelt, from a locality at 500m in western Colombia, collected from March to June. The principal difference given was the lighter coloration of both wing surfaces, which is apparent in the two syntypes now in the BMNH, one of which was figured in the original description. However, this is entirely due to both specimens being slightly worn and female rather than male, while male specimens of *A. rothschildi* from western Colombia do not differ from the Ecuadorian holotype, and I therefore follow Hall (1938) in regarding *pallida* as a synonym of *rothschildi*.

This is a very distinctive species which is superficially closest in wing pattern to *A. levona*, but may, however, be the sister species of *A. stilesiana*. *Adelpha rothschildi* and *A. stilesiana* have very similar male genitalia, with the clunicula noticeably more anteriorly positioned (nearer to the base of the valvae) than in *A. levona*, while the posterior tip of the valvae is broader. Both species have rounded hindwings, with the inner postdiscal series on the VHW much closer to the postdiscal band than to the inner submarginal series and the outer submarginal series typically more expressed than in *A. levona*. The postdiscal series and postdiscal band on the VFW are apparently entirely fused (this also occurs in *A. levona*), the spot of the upper postdiscal band in cell M_3-M_2 on the DFW is absent, with the result that the basal edges of the upper postdiscal band in cells M_2-M_1 and M_1-R_5 and the postdiscal spot in cell M_3-M_2 are not aligned (they are in *A. levona*), and both have a thin, well defined brown basal streak in the VFW discal cell. Both *A. rothschildi* and *A. stilesiana* lack sclerotised bands on the corpus bursae of the female genitalia, placing them in the *A. cocala* group. Due to extensive wing pattern modification in both *A. rothschildi* and *A. stilesiana* I cannot isolate the most closely related species within the *A. cocala* group; although both species are perhaps most similar in general ventral wing coloration to *A. boreas*, the male genitalia, which lack terminal spines on the valvae, indicate no particularly close affinity to that species, being more similar to those of *A. erymanthis* and *A. sichaeus*.

Range: Central western slopes of the Colombian Cordillera Occidental in Colombia to northwestern Ecuador, with a single record from Mesopotamia on the eastern slopes of the Colombian Cordillera Central, in Antioquia, which may represent a mislabelling.

Habitat and adult ecology: *Adelpha rothschildi* is a rare species restricted to premontane rain forest throughout its range. All recent, reliable records are from 800-1250m, while there are earlier records of 500m which require confirmation. I have found males of the species in western Ecuador to be attracted to traps baited with rotting fish or banana, in light gaps or wide trails along ridge tops in the vicinity of primary forest, from 10.30am to 2pm. I also once observed a single male perching approximately 10m above the ground beside a stream, along a wide, forested hillside trail, during the middle of the day. Raguso & Gloster (1996) report this species from the Reserva Maquipucuna in Pichincha Province of western Ecuador, but this record could equally well apply to *A. levona*, or possibly *A. salus emmeli*, or to several of these species. They found males perching from 4-7m above the ground along river sides and ridge top forest trails, from 11am to 2.30pm. Their upper elevational limit of 1600m would be a range extension for any of the three possible species to which their "*A. rothschildi*" may apply. With the exception of a single record in January, and records of Raguso & Gloster (1996) of September to December, all specimens have been collected from March to August, the wet season and early dry season, suggesting that adults of this species may fluctuate seasonally in abundance. The species is sympatric with *A. levona* throughout its range and occurs in the same sites, and the two are almost certainly involved in mimicry.

Specimens examined: 20 (17♂, 3♀)

COLOMBIA (12♂, 2♀): *Antioquia*: Mesopotamia 1♂ AMNH-error?; "*Caquetá*": Río Orteguaza 1♂ BMNH-error; *Valle del Cauca*: Cali-Buenaventura km 55 Apr. 1♂ ESM; Calima Valley 1200m Aug. 1♂ AME; Juntas, Cauca Dec. 1♂ BMNH; Queremal 1200-1250m km 55 Jul. Aug. 4♂ LMC; Río Anchicayá 1000m Jan. 1♂ AME; Río Dagua 600-1000m 2♂ ZMHU; *Not located*: W. Colombia 500m Mar.-Jun. 2♀ BMNH. **ECUADOR** (5♂, 1♀): *Esmeraldas*: Anchayacu, km 15 Lita-San Lorenzo rd. 950m Jul. 1♂ KWJH; *Carchi*: Lita, ridge east of Río Baboso 1050m Jul. Aug. 3♂ KWJH; *Imbabura*: Paramba 3500' May dry season 1♂ BMNH; *Pichincha*: San Antonio 1200m 1♀ KWJH.

Additional locality data: **ECUADOR**: *Esmeraldas*: Río Chuchuví 800m Jul.; *Imbabura*: Río Verde 1200m Aug. (Willmott & Hall, sight records).

Adelpha stilesiana DeVries & Chacón, 1982

Figs. **99a,b**; 190a,b; 267a,b; *308*

Adelpha stilesiana DeVries & Chacón (1982: 123, figs. 1-3)

TL: Estación La Montura, Parque Nacional Braulio Carrillo, San José, Costa Rica. **Types**: **BMNH**(M): **HT**♂: Estación la Montura, 1100m, 24 May 1981, *leg.* Ruben Canet M.; **PT**♀: same locality as HT, 11 June 1980, *leg.* F. G. Stiles [examined]

Identification, taxonomy and variation:

This species is distinguished from all other *Adelpha* species by the orange band on the DFW extending to the distal margin from cell M_3-M_2 to the tornus.

DeVries and Chacón (1982) described this species based on a male (Fig. 99a,b) and female from Costa Rica, and these two specimens, in the BMNH, are still the only specimens that I have seen in collections. The relationships of *A. stilesiana* within the genus are difficult to discern given the extensively modified wing pattern, but it may well be related to *A. rothschildi*, which occurs in similar montane habitats, as discussed under that species.

Range: This species appears to be endemic to the Talamanca massif in Costa Rica and western Panama; in addition to the type locality, the species has been reported to me from Volcán Chiriquí in Panama, in April, by Francisco Delgado (pers. comm.).

Habitat and adult ecology: This is evidently a very rare species, and it is remarkable that it eluded earlier collectors who extensively worked the region in which it occurs. Part of this rarity may be due to a narrow elevational range, the species being reported to date only from 800-1100m (DeVries & Chacón, 1982), a very similar range to its possible close relative *A. rothschildi*. The capture of the first specimen (the paratype female) was most fortuitous, being discovered in a mist-net by Stiles, while the holotype was collected by Ruben Canet. DeVries & Chacón (1982) report that the species is locally not uncommon, and males may be seen between 8.00am and 11.00am perching on foliage on the insides of ravines or in the forest canopy. Apparently individuals perch in the same spot for 5-10 minutes, making sorties and returning to the same spot, then move to a different perch 50m or more away. Individuals have been seen from May to July, the wet season, again similar to *A. rothschildi*. The dorsal pattern is very similar to that of the sympatric *A. ethelda sophax*, *A. salmoneus salmonides*, *A. boreas boreas*, *A. salus* ssp. nov. and *A. lycorias melanthe*, and these species are almost certainly involved in mimicry.

Specimens examined: 2 (1♂, 1♀)

COSTA RICA (1♂, 1♀): *San José*: Est. La Montura, Parque Braulio Carrillo, 1100m, 24 May, 11 Jun. 1♂, 1♀ BMNH.

Adelpha boreas (Butler, 1866)

Figs. **100**; 191; 268; *308*

Identification, taxonomy and variation:

This species is distinguished from *A. ximena* by the orange DFW band extending into the tornus, with the distal edge inclined rather than parallel to the distal margin, and the postdiscal band on the VFW is not split by a vertical red-brown line. *Adelpha salus* may be distinguished by the two silver-grey spots of the inner submarginal series in cell 2A-Cu_2 on the VFW, which are fused with the postdiscal band in *A. boreas*, by the inner postdiscal series and postdiscal band on the VHW being entirely separate and the outer postdiscal band replaced by an orange-brown line, instead of silver-grey dashes. All other similar species may be distinguished by the reddish-purplish brown and silver-grey ventral colours, the absence of any pale markings basal of the postdiscal band on the VFW, except for some silver-grey scaling at the base of cells 2A-Cu_2 and Cu_2-Cu_1, the separate pale dashes of the postdiscal series in cell M_2-M_1 on the VFW, and on the VHW by the broad red-brown band in the postdiscal area, the overlapping inner postdiscal series and postdiscal band, and the closely spaced silver-grey dashes of the outer postdiscal series and inner submarginal series. There is geographically clinal variation in the extent to which the distal edge of the orange DFW band protrudes in cell M_3-M_2, the presence or absence of orange DFW subapical spots, the thickness of the VHW inner postdiscal series, and the extent to which the postdiscal series and postdiscal band are fused in cells Cu_1-M_3 and M_3-M_2 on the VFW. The DFW subapical spots may or may not be fused into a single band, and two subspecies are recognised.

The relationships of *A. boreas* within the genus are difficult to ascertain. The female genitalia, which lack sclerotised bands on the corpus bursae, place the species in the *A. cocala* group, as does the basally indented submarginal series in cell M_3-M_2 on the VHW, but the male genitalia are not very similar to any other species in the group, having an elongate, posteriorly spined valva and high clunicula typical of the *A. capucinus* group. The ventral coloration is also more reminiscent of the *A. capucinus* group, and it may be that this species is one of the more primitive members of the *A. cocala* group. DeVries (1987) gave a very short description of the early stages, and stated that the larva had similar spines to the larva of *A. cocala*, and a pupa similar to *A. leucophthalma*. I have, however, not examined any material.

Range and status: Costa Rica to western Colombia, Andean foothills from northwestern Venezuela to Bolivia, and the Guianan plateau from southern Venezuela to French Guiana. Common to uncommon in lowland forest near mountains and premontane forest from 100-1600m.

Specimens examined: 247 (232♂, 15♀)

Adelpha boreas boreas (Butler, 1866)

Figs. 2f; **100a,b**; 191a,b; 268a,b; *308*

Heterochroa boreas Butler (1866: 668, fig. 2)

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9799 Heterochroa boreas ♂ Butl.//H. Boreas Butl. type//Bolivia//Type//Syntype" [examined]

=*Heterochroa tizona* C. & R. Felder (1867: 424) **syn. nov.**

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: “Holotype//Tizona n.//Type//Tizona Felder//Bogotá Lindig Type// Illustrated in The Butterflies of Venezuela A. Neild, 1996//5” [examined]

=*Adelpha boreas tizonides* Fruhstorfer (1908: 8) (also 1909a: 41) **stat. nov.**

TL: Colombia. **Types**: **BMNH**(T): **ST**♂: “boreas tizonides Fruhst.// Fruhstorfer Coll. B.M. 1933-131//Columbien ex coll. H. Fruhstorfer// TYPE//Type//Syntype”; **BMNH**(M): **ST**♂: “tizonides Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Columbien ex coll. H. Fruhstorfer//Paratype” [both examined]

=*Adelpha verenda* Fruhstorfer (1913: pl. 108c; 1915: 513)

TL: [Peru]. **Types**: **BMNH**(T): **ST**♂: “Syntype ♂ Adelpha boreas verenda Fruhstorfer G. Lamas det. 1987//Fruhstorfer Coll. B.M. 1933-131//Peru H. Fruhstorfer//TYPE//Type//Syntype”; **BMNH**(M): 2**ST**♂: “Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//Paratype”; **ST**♂: “Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//Paratype//verenda Fruhst.”; **ST**♂: “Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//Paratype//boreas verenda Fruhst.”; **BMNH**(R): **ST**?♂: “Caradoc, Marcapata 4000' II. 01 (Ockenden)//verenda Fruhst.//R” [all examined]

=*Adelpha boreas opheltes* Fruhstorfer (1915: 513) **syn. nov.**

TL: Panama. **Types**: **ZMHU**: **ST**?♂: “Chiriquí//Syntype ♂ Adelpha boreas opheltes Fruhstorfer G. Lamas det. ‘87//Syntype” [examined]

Adelpha boreas Butl., Kirby (1871); *Adelpha tizona* Fldr., Kirby (1871); *Adelpha tizona boreas* Butl., Fruhstorfer (1908); *Adelpha boreas* f. *boreas* Butl., D’Abrera (1987); *Adelpha boreas* f. *tizonides* Fruhst., D’Abrera (1987)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. b. kayei* under that subspecies. There is quite substantial geographic variation in this subspecies and a number of names have been applied to phenotypes from various regions. However, after examination of a long series of specimens I conclude that all of the variation is smoothly clinal in nature and subject to too much individual variation to further split this taxon. Individuals from the north and west of the range, in Colombia and Panama, have a narrower orange DFW band with a smooth distal edge, while the orange DFW subapical spots are typically reduced or absent. The inner postdiscal series on the VHW, which overlaps the postdiscal band, is more pronounced silvery grey, the dark red-brown band separating it from the more basal silver-grey scaling is broader throughout the wing, and the base of cell Cu_2-Cu_1 on the VFW has less silvery grey scaling. Specimens from Peru to Bolivia typically have larger orange DFW subapical spots, the distal edge of the orange DFW band is notably produced in cell Cu_1-M_3 and the VHW is a duller, darker red-brown due to the reduction of the inner postdiscal series. The postdiscal series on the VFW in cells Cu_1-M_3 and M_3-M_2 are separated from the postdiscal band by red-brown scaling, which is more extensive along the distal edge of the band in cells Cu_2-Cu_1 and Cu_1-M_3, but they become gradually fused from south to north in Peru and Ecuador, and are typically almost completely fused in Colombia. The other characters of the DFW band and VHW postdiscal area also gradually change from south to north and across Colombia. There is individual variation in the size of the orange marking in cell 2A-Cu_2 on the DFW, which may or may not completely cross the cell.

Butler (1866) described this species from an unspecified number of specimens from Bolivia, and the detailed description, illustration showing the ventral surface and syntype in the BMNH clearly refer to this taxon. Felder & Felder (1867) appear to have been unaware of Butler’s description when they described *tizona* a year later, for they compared it to *A. irmina* with no mention of *A. boreas*. The description was based on an unspecified number of female specimens collected by Lindig at Bogotá, and a syntype male, presumably misidentified as a female, is in the BMNH. This syntype has the ventral surface typical of all northern specimens, the orange DFW band is slightly produced in cell M_3-M_2 and there are two small subapical spots. The postdiscal series on the VFW in cells Cu_1-M_3 and M_3-M_2 are almost fused with the postdiscal band. Fruhstorfer (1915) and all subsequent authors treated *tizona* as a subspecies of *boreas* (Hall, 1938; DeVries & Chacón, 1982; Neild, 1996), probably due, in part, to the complete absence of specimens in public collections of *A. boreas* from eastern Ecuador, which show intergradation between Colombian and Peruvian forms. As discussed above, the differences between *tizona* and *boreas* appear to be smoothly clinal and I therefore synonymise the two names (**syn. nov.**). Fruhstorfer (1908) stated that there were two subspecies in Colombia, one larger, with a more rounded hindwing, indistinct DFW subapical spots, a smoothly edged DFW postdiscal band, and the hindwing with a narrower red-brown postdiscal band, and a smaller, possibly dry season form, with a more produced tornus, a broader, browner VHW postdiscal band, larger DFW subapical spots, and a narrower DFW postdiscal band which was more produced in cell M_3-M_2. However, it appears that he was unable to say to which of these subspecies the name *tizona* applied, since he stated that the name *tizonides* applied to whichever form was that not described by the Felders. Later, Fruhstorfer (1915) applied the name *tizonides* to the first of these phenotypes and stated that it represented the subspecies from western Colombia and Cundinamarca. The syntype in the BMNH(T) closely matches this description, but although Neild (1996) retained the name as distinct from *tizona*, I regard the differences between Fruhstorfer’s supposed subspecies as too minor and variable to warrant separate recognition, as did Hall (1938), and I therefore synonymise *tizonides* with *boreas* (**stat. nov.**). Fruhstorfer (1913, 1915) went on to figure and describe Peruvian specimens as a further subspecies of *A. boreas*, *verenda*, which he compared to *tizona*. The syntype series in the BMNH show no consistent differences from typical *boreas* and the name was synonymised by Hall (1938). *Adelpha boreas opheltes* was described by Fruhstorfer (1915), based on an unspecified number of specimens from Panama, as differing from *tizonides* by the smoother distal edge of the orange DFW band and broader brown postdiscal band on the VHW. A single male in the ZMHU has been labelled as a syntype by Gerardo Lamas, but I do not know the evidence on which this was based. However, there is no doubt as to the taxon to which Fruhstorfer was referring, since the differences cited by him are indeed apparent between typical specimens from Panama and Colombia, in addition to the orange DFW subapical spots usually being reduced or absent. All subsequent authors (Hall, 1938; DeVries, 1987; Lamas & Small, 1992) have recognised *opheltes* as a distinct subspecies, but there is scarcely any difference in wing pattern between typical Panamanian specimens and the syntype of *tizonides* in the BMNH(T), which is probably from western Colombia. Since I can find no characters that consistently distinguish the two phenotypes that do not appear to vary clinally throughout Colombia, I synonymise *opheltes* with *boreas* (**syn. nov.**).

Range: I have examined specimens of this species from western Panama to western Colombia, and along the eastern Andes from Colombia to Bolivia. DeVries (1987) also reports it in Costa Rica, while Neild (1996) reports it from Venezuela in the southwestern Cordillera de Mérida. The record in de la Maza & de la Maza (1993) is probably *A. salus* ssp. nov.. I have seen only a single specimen from the western slope of the Cordillera Occidental in Colombia, but it probably occurs throughout this slope to western Ecuador.

Immature stages: DeVries (1986, 1987) gives notes on the early stages of this species in Costa Rica. However, since I have seen no voucher specimens, and DeVries did not recognise the presence of the very similar *A. salus* ssp. nov. in Costa Rica, some or all records might apply to that species, which is at least as common in collections from Costa Rica as *boreas*. The egg is white and laid singly, up to several times per plant (*Chomelia*). The mature larva is mottled brown and green, with a scoli arrangement similar to *A. cocala*, and the head capsule is brown with a corona of short spines. The pupa is pale brown and of similar shape to *A. leucophthalma*, "without flanges on the bifid head".

Solitary early instars feed on new leaves and make frass chains, on plants growing along forest or river edges or in forest light gaps.

Habitat and adult ecology: This species is clearly rare in certain parts of its range, such as the Chocó, Costa Rica and Venezuela, but in the eastern Andes it is widespread and not uncommon. It occurs in primary forest and is essentially associated with montane areas throughout its range, where its recorded hostplant family, Ericaceae, is most diverse (Gentry, 1993), though it may occasionally descend to near sea level in Central America (DeVries, 1987). DeVries (1987) reports that the species occurs as rare, solitary individuals from 100-1000m in Costa Rica. I have found it to be common in the wet season in eastern Ecuador, though present throughout the year, in both ridge top and river side sites from 450-1600m, though it is encountered most frequently from 600-1200m. Males are usually encountered as solitary individuals in light gaps in dense forest, attracted to traps baited with rotting fish, and occasionally rotting banana, during periods of bright sun. In the eastern Andes, this species is sympatric and probably involved in mimicry with *A. zina irma*, *A. irmina*, *A. salmoneus*, *A. saundersii* and *A. ximena*, while west of the Andes it also occurs with the superficially similar *A. salus*, *A. ethelda* and *A. stilesiana*. The larval hostplant *Satyria* is an epiphyte (DeVries, 1987), an unusual hostplant for the family Nymphalidae, possibly contributing to the general rarity of the female in collections, which perhaps spends much of her time in the canopy.

Specimens examined (230♂, 12♀):
PANAMA (7♂, 3♀): *Chiriquí*: Bugaba 800-1500' 2♂, 1♀ BMNH; Chiriquí 2♂, 2♀ ZMHU, 1♂ BMB, 2♂ MCZ. **COLOMBIA** (104♂, 7♀): *Antioquia*: Crystallina, W. Col. 1000-1100' Jun. Jul. 1♂ BMB; Medellín 1♀ AME; *Boyacá*: Muzo Jun. Jul. 1♂ BMNH, 1♂, 1♀ AME, 2♂ BMB; Otanche Feb. 2♂ JFL; *Caquetá*: Florencia 1800m Mar. 1♀ ESM; *Cundinamarca*: Bogotá 34♂ BMNH, 1♀ AME, 3♂ USNM, 6♂ BMB; env. de Bogotá 6♂ BMNH; Cananche Jun. Jul. Sep. 16♂ BMNH; La Mesa 4000' Jul. 1♂ BMB; La Palma Aug. 2♂ BMNH; *Meta*: U. Río Negro 850m 1♂ USNM; San Martín 1♂ BMNH; Villavicencio 400-1300m Feb.-Apr. 1♀ BMNH, 3♂ AME; Villavicencio-Río Ocoor 350-400m Feb. 1♂ BMNH; *Nariño*: Monopamba Feb. 1♂ ESM; *Putumayo*: Mocoa 800m Sep. Dec. 2♂ MHNUC; *Tolima*: Río Chili Apr.-Jun. 1♂ BMB; *Valle del Cauca*: Río Tatabro 200m Jun. 1♀ LMC; *Not located*: Interior 1♂ BMNH; Magdalena V. May-Aug. 1♂ BMB; no specific locality 4♂ BMNH, 3♂, 1♀ ZMHU, 8♂ BMB, 1♂ MNHN, 1♂ MCZ. **ECUADOR**: (16♂, 2♀): *Morona-Santiago*: Bomboiza 850m May 1♂ KWJH; Méndez-Santiago rd., km 40, Oct. Nov. 2♂ MJP, 1♂ DAT; Río Abanico 1600m Nov. 1♂ DAT; *Napo*: Chichicorrumi Oct. 2♂ MJP; Pimpilala Sep. Oct. 2♂, 2♀ KWJH, 1♂ MJP; Santa Rosa Nov. 1♂ DAT; *Pastaza*: Río Llandia 950m Aug. 1♂ KWJH; Shell 1050m Feb. 1♂ KWJH; *Not located*: no specific locality 3♂ JFL. **PERU** (63♂): *Amazonas*: Falso Paquisha 800m Oct. 2♂ MUSM; *Cuzco*: Caradoc 4000' Feb. 1♂ BMNH; Cosñipata Valley 2♂ BMNH; Quebrada Quitacalzón, Cosñipata 1050m Sep. 1♂ MUSM; Quincemil Nov. 1♂ MUSM; *Huánuco*: Cord. del Sira 800m Aug. Sep. 1♂ MUSM; Río Monzón 1000m Jul. 1♂ MUSM; Tingo María 670m Mar. May Jul. Sep. 8♂ AME, 2♂ FSCA, 2♂ MUSM; Tournavista 1♂ AME; no specific locality 1♂ BMB; *Junín*: Chanchamayo 1♂ ZMHU, 1♂ BMB; La Merced 2500' 1♂ BMB; Río Colorado 2500' Aug.-Oct. 2♂ BMNH; Satipo Dec. 1♂ AME; *Loreto*: Iquitos 1♂ USNM-error?; *Madre de Dios*: Shintuya Jul. 2♂ AME; *Pasco*: Chuchuras 2♂ MUSM, 1♂ ZMHU; Pichis rd. 3-5000' 2♂ BMNH; Pozuzo 900-1000m 1♂ BMNH, 1♂ BMB; *Puno*: Chaquimayo 25-3000' May-Aug. Oct. 5♂ BMB; La Oroya 2500' Nov. 1♂ BMNH; La Pampa Nov. 2500' 2♂ BMNH; San Gaban 2500' Mar. Apr. 2♂ BMNH; Yahuarmayo 1200' Oct. Nov. 1♂ BMB; *Not located*: Río Huallaga 1♂ BMB; no specific locality 9♂ BMNH, 1♂ ZMHU, 1♂ MCZ, 1♂ JFL. **BOLIVIA** (24♂): *Cochabamba*: Cochabamba 1♂ BMNH; El Palmar Apr.-Jun. 3♂ AME; San Jacinto 6-8000' 1♂ BMNH; *La Paz*: Caranavi 1200m Nov. 1♂ MUSM; Río Songo 1♂ ZMHU; Río Songo-Río Suapi 1100m Mar.-Jun. 1♂ BMNH; Yungas 3♂ BMNH; *Potosí*: Tupiza 1♂ ZMHU; *Santa Cruz*: Río Juntas 1000m 2♂ ZMHU; *Not located*: no specific locality 9♂ BMNH, 1♂ BMB. **COUNTRY UNKNOWN** (16♂): no specific locality 3♂ BMB, 6♂ MCZ, 3♂ USNM, 2♂ BMNH, 2♂ AME.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Bomboiza Jul.; *Napo*: Apuya Aug. Sep. Oct. Dec.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi 450m Feb. Jul. Sep.; El Capricho Oct.; Finca San Carlo Feb. Aug. Sep. Dec.; Pano Apr.; Pimpilala Feb. Aug.; Satzayacu Apr. Sep.; *Pastaza*: Hacienda Moravia 1200m Feb.; Puyo-Canelos rd., km 30, 700m Oct.; Pitirishca Jul.; Puyo-Tena rd., km 35, Oct.; Shell Apr. Oct. (Willmott & Hall, sight records).

Adelpha boreas kayei Hall, 1939

Figs. **100c,d**; *308*

Adelpha tizona kayei Hall (1939: 100)

TL: Potaro River, Guyana. **Types**: **AME**: **HT**♀: "TYPE//Potaro Riv. Brit. Guiana Percival ~~G.B. Roberts~~ 4.7.'01//Tizona kayei Hall B. G." [examined]

Adelpha boreas kayei Hall, Brévignon & Brévignon (1997)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by having the orange DFW subapical spots in cells M_2-M_1 and M_1-R_5 enlarged and united to form a continuous orange band between the postdiscal band and the costa. These spots are slightly thinner in the single Venezuelan male examined than in the remaining females.

Hall (1939) described this taxon as a subspecies of "*A. tizona*" (=*A. boreas*) based on a single female in Kaye's collection from Potaro River in Guyana. Hall mentioned that the orange DFW subapical spots were united into a band, and the holotype specimen is now in the AME (Fig. 100c,d).

Range: This subspecies ranges from southern Venezuela to French Guiana across the Guianan plateau. In addition to the holotype, and single female in the BMNH, I have also examined a photograph (courtesy of Andrew Neild) of a male and a female in the MIZA collected in Venezuela, and the subspecies is figured from French Guiana by Brévignon & Brévignon (1997). Although unrecorded to date from Surinam and northern Brazil, it presumably occurs there also.

Habitat and adult ecology: This subspecies is clearly rare and its range is disjunct from the nominate. It occurs in mountainous areas of the Guiana plateau, and has been recorded up to 1400m.

Specimens examined (2♂, 3♀):
VENEZUELA (1♂, 1♀): *Amazonas*: Marahuaka-Macizo Central, P.N. Duida Marahuaka 1040m Mar. 1♂, 1♀ MIZA(photograph). **GUYANA** (1♂, 2♀): *Potaro/Siparuni*: Potaro River 1♀ AME; Mt. Ayanganna 1400m 1♂ coll. S. Fratello; *Not located*: no specific locality 1♀ BMNH.

Adelpha cocala (Cramer, 1779)

Figs. **101**; 192; 269; *309*

Identification, taxonomy and variation:

Adelpha cocala is a distinctive species, characterised by the VFW postdiscal series being variably fused, though visibly separate in cell M_2-M_1, forming a distinct, vertical band of even width, parallel to and separated from the postdiscal band by slightly darker scaling, which may or may not form a solid line. The postdiscal series of the VFW are always coloured matt yellowish brown, rather than the pale, shining yellowish white of the majority of species, and this is particularly noticeable in cell M_3-M_2. The entirely reddish brown ground colour is also notable. A character shared with *A. felderi*, *A. leucophthalma* and *A. irmina* is the configuration of the VFW inner submarginal series: the usual silver-grey spots are reduced and faded in cells Cu_1-M_3 and M_3-M_2, but present as two rounded, silvery white spots in cells M_2-M_1 and M_1-R_5, then absent to the apex. Another useful diagnostic character is the basally displaced, typically arrow-shaped silver-grey marking of the VHW inner submarginal series in cell M_3-M_2. The species with the most similar wing patterns are *A. viola*, which, in addition to certain characters given above, can be distinguished by having a third VFW discal cell bar and the outer postdiscal series on the VFW present as silvery grey dashes, and *A. boeotia*, which additionally has the orange DFW subapical spot in cell M_2-M_1 more distally displaced. *Adelpha c. lorzae* and *A. c. orellanae* are additionally distinguished from all similar species by having the upper postdiscal band on the VFW coloured matt yellowish brown, rather than pale, shining yellowish white. There is geographic variation in the presence or absence, and size, of the orange DFW subapical spots, the overall width of the orange DFW band and its width and colour in cell $2A$-Cu_2, the width of the white DHW band and the presence or absence of a more distal orange band, and the ground colour of the ventral surface, and five subspecies are recognised.

Adelpha cocala is superficially similar to many species, but the female genitalia, which lack sclerotised bands on the corpus bursae, place it in a group of 20 or so species, in which the male genitalia, with spines at the posterior tip of the valva, and the distinctive VFW inner submarginal series described above, suggest it is most closely related to *A. felderi*, *A. leucophthalma* and *A. irmina*. All four of these species also share similar yellowish brown ventral ground colour, the inner submarginal marking in cell M_3-M_2 on the VHW is basally displaced, and the upper postdiscal band on the VFW is yellowish brown (except in *A. c. cocala*, *A. c. didia* and *A. c. caninia*). A single *Adelpha* specimen in the USNM is also a possible hybrid between *A. cocala cocala* and *A. irmina tumida*, and is discussed under *A. irmina*.

Range and status: Mexico to western Ecuador, Venezuela to Bolivia, Brazil and the Guianas. Widespread and common to very common in lowland forest from sea level to 1450m.

Specimens examined: 851 (590♂, 261♀)

Adelpha cocala cocala (Cramer, 1779)

Figs. **101a,b**; 192a,b; *309*

Papilio cocala Cramer (1779: 83, pl. 242, fig. F, G)

TL: Surinam. **Types**: **Collection unknown**: **ST**: [not located]

=*Heterochroa urraca* C. & R. Felder (1862: 115)

TL: “Río Negro”-erroneous. **OTL**: [fluminis Negro superioris in Brasilia septentrionali]; Bahia, Brazil. **Types**: **BMNH**(R): **LT**♂: “Syntype//Type//Río Negro Type//urraca n.” [examined]

=*Adelpha saparua* Fruhstorfer (1913: pl. 106c; 1915: 516)

TL: [Suapura River, Venezuela]. **Types**: **BMNH**(R): **ST**♀: “Syntype//TYPE//R//Suapure Ven. (S. Klages)//cocala suapura Fruhst.//Illustrated in The Butterflies of Venezuela A. Neild, 1996//39” [examined]

=*Adelpha urracina* Fruhstorfer (1913: pl. 106c; 1915: 516) **stat. nov.**

TL: [Peru; Bolivia; Mato Grosso (Brazil)]. **Types**: **BMNH**(T): **ST**♂: “Syntype ♂ Adelpha cocala urracina Fruhstorfer G. Lamas det. 1987//Amaz. S. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//TYPE//Type//Syntype”; **BMNH**(M): **ST**♂: “Amaz. S. Fruhstorfer//cocala urracina Fruhst.//Fruhstorfer Coll. B.M. 1937-285”; **ST**♀: “Amaz. S. Fruhstorfer//TYPE//Fruhstorfer Coll. B.M. 1937-285”; **ST**?♂: “Mato Grosso H. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285”; **BMNH**(R): **ST**♂: “Prov. Sara Dept. S. Cruz de la Sierra IV. to beg. V. 04 (J. Steinbach)//cocala urracina Fruhst.” [all examined]

=*Adelpha cocala lorzina* Fruhstorfer (1915: 516) **syn. nov.**

TL: Colombia. **Types**: **BMNH**(T): **ST**♀: “cocala lorzina Fruhst.//Bogotá//Syntype” [examined]

Adelpha cocala Cram., Hübner ([1819]); *Nymphalis cocala* Cram., Godart ([1824]); *Heterochroa cocala* Cram., Westwod (1850); *Adelpha cocala* Cram., Kirby (1871) (Kirby listed this as No. 47a, and *capucinus* as 47); *Adelpha cocala* var. *urraca* Fldr., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. c. lorzae* and *A. c. orellanae* by the VFW postdiscal band being whitish cream, contrasting with the postdiscal series, which are yellowish brown, whereas in the latter two taxa both the postdiscal series and the postdiscal band are yellowish brown. The orange DFW subapical spots are also more pronounced in *A. c. cocala*, with that in cell M_2-M_1 being of similar thickness to the upper postdiscal band in cell M_1-R_5, whereas in *A. c. lorzae* and *A. c. orellanae* the subapical spots are reduced to dots or absent. Both *A. c. didia* and *A. c. caninia* differ by having a much more reddish rather than purplish ventral coloration, with the basal silvery areas more greyish, the VFW postdiscal band is much thinner, and the postdiscal series on the VHW and the submarginal series on the VFW are both reduced. There is slight individual variation in the size of the orange DFW subapical spots, the thickness of the VHW inner submarginal series, and some specimens have the area of the postdiscal band on the DFW slightly paler yellowish white than the remainder of the band.

Cramer (1779) described this species from an unspecified number of specimens from Surinam in the collection of Mr. C. Stoll. Although the syntype specimen or specimens should be in either the RMNH or the BMNH (Vane-Wright, 1975), none are known to exist (G. Lamas, pers. comm.; pers. obs.). However, Cramer also figured both wing surfaces of the species, and the ventral pattern, with the contrastingly coloured postdiscal band and postdiscal series and lack of a third VFW discal cell bar (present in the otherwise similar *A. viola pseudococala*), leave no doubt as to the identity of the taxon. Felder & Felder (1862) described *Heterochroa urraca* without reference to *A. cocala*, comparing it instead to *A. erotia*, *A. justina* and *A. leucophthalma*. The description was based on an unspecified number of male specimens supposedly from the upper Río Negro in Brazil (actually the Río Huallaga in Peru, above Yurimaguas (Lamas, 1976)), and the species was also mentioned to occur in Bahia, in Brazil. The description could apply to this taxon as well as several others, so it is fortunate that there is a syntype in the BMNH(R), with the following data, which I designate here as the lectotype of *Heterochroa urraca*: “Syntype//Type//Río Negro Type//urraca n.”. There are two males of *A. cocala didia* in the BMNH(R) from Bahia, which may well be the specimens to which the Felders referred in their description, and these would therefore be paralectotypes of *urraca*. Although both Fruhstorfer (1915) and Hall (1938) retained *urraca* as distinct from *cocala*, I have been unable to find any consistent differences between Guianan and upper Amazonian specimens, and therefore follow Neild (1996) in regarding *urraca* as a synonym of *cocala*. Fruhstorfer (1913) figured *A. saparua*, later misspelt *suapura* and placed as a subspecies of *A. cocala*, based on an unspecified number of specimens from the Suapura river in Venezuela, stating that they differed in having a reduced band on the DFW (Fruhstorfer, 1915). The syntype in the BMNH does not differ from typical *A. cocala* and the name was synonymised by Neild (1996). Fruhstorfer (1913) figured *A. urracina* based on specimens from several Amazonian regions, also later placed as a subspecies of *A.*

cocala, supposedly differing in having broader, darker DFW bands, while *A. cocala lorzina*, based on an unspecified number of specimens from Colombia, supposedly had narrower dorsal postdiscal bands on both wings (Fruhstorfer, 1915). I have examined a number of syntypes of these taxa in the BMNH, and neither they, nor the populations they represent, differ consistently from any other Amazonian or Guianan populations, and I therefore synonymise both *lorzina* and *urracina* with *cocala* (**syn. nov.**, **stat. nov.**).

Range: Southern Venezuela to Bolivia, throughout Amazonian Brazil and in the Guianas. I have also seen two specimens which appear to be from the Cordillera de la Costa in Venezuela, labelled "Rancho Grande" and "Caracas"; unless they are mislabelled, these specimens imply that the nominate subspecies also extends west along the coast probably up to the western tip of the Cordillera, where *A. cocala lorzae* terminates its range eastwards.

Immature stages: Moss (1933) reared this species in Brazil (Pará), and figured three colour varieties of the last instar (pl. I, figs. 3, 4, 5) and the pupa (pl. II, fig. 3). Early instars are dark brown, later instars are bright green, reddish in the centre of the body with whitish pink, oblique lateral stripes, and broad, curved scoli. Moss' figures show some variation in the brightness of the pale oblique lateral abdominal stripes, and these may be confined to slight shading in the middle of the body. The pupa has relatively small dorsal projections on segments A2 and T2, and has leaf-shaped, laterally pointing head horns.

The larvae may feed either on leaves more than 2m above the ground, or near the ground on the lowest leaves of seedlings. Larvae extend the leaf midrib, where they rest, and also rest in the Front-Curved and Front-Arched-Rear-Up position (Aiello, 1984).

Habitat and adult ecology: This subspecies is widespread and very common in most lowland forest habitats from sea level to at least 1450m. In eastern Ecuador, it is probably the most common forest species of *Adelpha*, occurring in both primary and secondary forest. Males are frequently found perching in small groups along forest paths throughout the day in small light gaps from 2-4m high, particularly on ridge tops, engaging in aerial interactions with other perching males. During the drier months, when *Adelpha* activity is low, this species remains quite abundant and is often the only species seen in a lowland site. Males may be attracted to traps baited with rotting fish in forest light gaps and along wide forest trails, while females are generally rarer and are typically encountered along forest edges and in large light gaps.

Specimens examined (243♂, 110♀):
VENEZUELA (6♂, 4♀): *Aragua*: Rancho Grande Apr. 1♀ AMNH; *Bolívar*: El Dorado Oct. 1♂ FSCA; Javillal 100m Sep. 1♀ AFEN; Suapure 1♂ BMNH, 1♂ AMNH; Río Grande Res. Stn., 26 km E. El Palmar (blacklight Heppner) Mar. 1♀ USNM; *Delta Amacuro*: Río Acure 1♀ AME; *Distrito Federal*: Caracas 1♂ AME; *Monagas*: Río Caribe-Bohordal 20m Nov. 2♂ AFEN. **COLOMBIA** (18♂, 4♀): *Amazonas*: Florida May 1♂ BMNH; Hda. Tacana 150m Sep. 1♂ MHNUC; Leticia 1♀ USNM; "*Boyacá*": Muzo 1♀ AME-error; *Caquetá*: Río Bodoquero Jan. 1♂ USNM; "*Cundinamarca*": Bogotá 2♂, 1♀ BMNH, 1♂ MCZ-error; Medina 1♂ ESM-error; *Guaviare*: Río Guayabero Apr. 1♀ ESM; *Meta*: San José Guaviare Jun. Aug. 2♂ JFL; Villavicencio May Aug. 2♂ AMNH, 1♂ LMC; Villavicencio-Mt. Redondo Mar. 1♂ BMNH; *Putumayo*: Mocoa Sep. 1♂ JFL; Umbría 2♂ AMNH; *Not located*: no specific locality 1♂ MNHN, 1♂ AMNH. **ECUADOR** (33♂, 13♀): "*El Oro*": Pasaje 500m Apr. 1♂ AME-error; *Morona-Santiago*: Bomboiza 850m Jul. 2♂ KWJH; 2°-4°S, 78°W 875m Nov. Dec. 2♂ AMNH; *Napo*: Ahuano 2♀ BMNH; Chichicorrumi 450m Sep. Oct. 1♂ KWJH, 1♂ MJP; Coca, 35 km S.W., Apr. 1♂ MJP; Cotundo Jul. 1♂ USNM; Río Coca Jun. 1♂, 1♀ AME; Río Jondachi Nov. 1♂ USNM; Río Napo 1♀ MNHN; Santa Rosa Apr. 2♂ MJP; Sinde Oct. 1♂ MJP; *Pastaza*: Canelos Jun. 1♂ DAT, 1♂ BMNH, 1♀ AMNH; Puyo-Tena rd., km 25, Oct. 1♂ MJP; Río Llandia 950m Aug. 1♂ KWJH; Sarayacu 3♂ BMNH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m May-Aug. Nov. Dec. 6♂, 3♀ PJD; Limoncocha Feb. Jul. Sep. 1♂, 2♀ FSCA, 2♂, 1♀ USNM; *Zamora-Chinchipe*: Zamora 2♀ BMNH; *Not located*: Oriente 2♂ AMNH; Pacific slope 1♂ USNM-error. **PERU** (118♂, 33♀): *Amazonas*: Falso Paquisha 800m Oct. 2♂ MUSM; Munichis 700m Aug. 1♂ AME; Río Santiago Jul. Sep. Oct. 4♂ AMNH; upper Río Marañón Sep. Dec. 5♂ AMNH; *Cuzco*: Quillabamba 950-1050m Mar.-May 1♂ MUSM; *Huánuco*: Cord. del Sira 800m Sep. Oct. 2♂ MUSM; Pachitea 1♂ BMB; Tingo María 670m Mar. Apr. Jun. Aug. Nov. Dec. 9♂ FSCA, 3♂ USNM, 2♂ AME, 1♂ MUSM; *Junín*: Boca Río Colorado, 9 km W., 900m Oct. 1♂ MUSM; Chanchamayo Jun. Jul. 4♀ BMNH, 2♂ ZMHU, 1♂ AME, 1♂ BMB; La Merced 3♂, 1♀ BMB; Satipo 7-800m May Jun. 1♂ MUSM, 1♂ AME; *Loreto*: Arcadia 150m Oct. Nov. 3♂, 3♀ MUSM; Bartra, Río Tigre 220m Sep. 1♂ MUSM; Castaña 150m Sep. 1♂, 1♀ MUSM; Iquitos Mar. Jul. 8♂, 1♀ AMNH, 4♂ BMNH, 1♀ ZMHU, 1♂ FSCA, 1♂ AME; Pebas Dec. 6♂ BMNH, 2♂, 1♀ ZMHU; Puerto Almendra, Río Nanay 120m Sep. 1♀ MUSM; "Río Negro" [=Río Huallaga] 1♂ BMNH; Río Cachiyacu 2♂ BMNH; Río Sucusari 140m Sep. 6♂, 7♀ MUSM; Sarayacu 1♀ ZMHU; Yanamono 120m Jul. 4♀ MUSM; Yurimaguas 1♂ ZMHU; *Madre de Dios*: Boca Río La Torre Feb. May Jul. Sep. Oct. 6♂, 1♀ MUSM; Maldonado, 30 km S.W., May 1♂ USNM; Pakitza 400m Apr. Sep. 3♂, 2♀ MUSM; Pampas del Heath 220m Jun. 1♂ MUSM; Puerto Maldonado 250m Aug. Oct. 3♂ AME, 1♀ USNM; Río Alto Madre De Dios 420m Jul. 1♂ AME; Shintuya Jul. 3♂ AME; *Pasco*: Quebrada Samantoshoari, 5 km S.E. Puerto Davis 210m Nov. 1♀ MUSM; *Puno*: Yahuarmayo Feb. Mar. 1200' 3♂ BMNH; *San Martín*: Achinamiza Jan. Dec. 3♂ AMNH; Jepelacio 4♂, 2♀ AMNH; *Not located*: Río Huallaga 4♂ AMNH, 1♂ BMNH, 1♂ USNM; Ucayali 1♀ BMNH, 1♂ ZMHU; no specific locality 3♂ BMNH. **BOLIVIA** (10♂, 3♀): *Cochabamba*: Chaparé Mar. 1♂ JFL; *El Beni*: Rurrenabaque 200m Jan. 1♀ MUSM; *La Paz*: Guanay Apr. Oct. 1♂ JFL, 1♀ AMNH; Sorata 1♂ MCZ; *Santa Cruz*: Buenavista Mar. 1♂ USNM; Juntas 300m 1♂ ZMHU; Prov. Sara Apr. May 1♂, 1♀ BMNH; Santa Cruz 1♂ BMB; *Not located*: no specific locality 2♂ AMNH, 1♂ BMNH. **BRAZIL** (33♂, 30♀): *Amazonas*: Amaz. S. 1♂, 1♀ BMNH; Coari 1♀ ZMHU; Ega 1♀ BMNH; Manaus 1♂ ZMHU; Manicoré 1♂ ZMHU; Massaury 1♀ ZMHU; Maués 1♀ ZMHU; Maués, Laginho Jul. 1♀ BMNH; São Paulo de Olivença 1♂ BMNH, 2♂, 1♀ ZMHU; Tefé Nov. 2♂ BMNH; *Maranhão*: Montes Aureos 2♀ BMNH; *Pará*: Cuiabá-Santarém, km 715, Sep. 1♀ USNM; Itaituba 1♂, 2♀ ZMHU; Óbidos 1♀ BMNH, 1♀ AMNH; Pará 22♂, 8♀ BMNH, 2♀ AMNH; Santarém 1♀ BMNH; *Rondônia*: Cacaulândia Mar. Oct. Nov. 1♂, 1♀ FSCA, 1♂, 1♀ USNM; *Not located*: Villa Bella 1♀ ZMHU; no specific locality 1♀ MNHN, 1♀ AMNH. **GUYANA** (7♂, 8♀): *Barima/Waini*: Mabaruma Dec. Jan. 3♂, 1♀ BMB; *Cuyuni/Mazaruni*: Bartica 1♂ AME; Cariamang River 2♀ BMNH; *Potaro/Siparuni*: Potaro River 1♂ AME; *Upper Demerara/Berbice*: Omai 1♀ BMNH; *Upper Takutu/Upper Essequibo*: Annai, Essequibo 1♂, 2♀ BMNH; *Not located*: Río Demerara 25m above sea level 1♂ BMNH, 1♀ BMB; no specific locality 1♀ AMNH. **FRENCH GUIANA** (10♂, 9♀): *Cayenne*: Cayenne 2♂, 2♀ BMNH, 2♀ ZMHU, 1♂, 1♀ MCZ, 1♂ USNM; Kaw Apr. 1♂ AMNH; Roura, Galion May Oct. 2♂ MUSM; *Laurent du Maroni*: St. Jean 1♂ USNM; St. Laurent, Maroni River 1♀ BMNH; Maroni River 1♀ AME; Saül Jan. Nov. 2♀ USNM; *Not located*: no specific locality 1♂ BMB, 1♂ MNHN. **SURINAM** (3♂, 2♀): *Brokopondo*: Bersaba 1♂, 1♀ ZMHU; *Para*: Para District Nov. 1♂ BMB; *Not located*: no specific locality 1♂, 1♀ BMNH. **COUNTRY UNKNOWN** (5♂, 4♀): Amazon 2♂ USNM; Amaz. S. 1♂ BMNH; Haut Amazone 1♀ MNHN; U. Amazon 1♂ BMB; no specific locality 1♀ MCZ, 1♂ BMNH, 1♀ MNHN, 1♀ USNM.

Additional locality data: **ECUADOR**: *Napo*: Apuya Feb. Apr. May Aug-Oct. Dec.; Cerro Lumbaquí Norte 950m Aug.; Chichicorrumi Jul.; El Capricho Oct.; Finca San Carlo Feb. Apr. Aug. Sep.; Las Minas de Misahuallí Jul.; Pano Apr.; Pimpilala Apr. Sep.; Río Yuturi Jul. Oct.; Satzayacu Apr. Sep.; Tiguino Oct.; Tiputini Sep.; Tiputini Biodiversity Station 300m Aug.; Yasuní Jul. Aug.; *Pastaza*: Lorocachi Jul.; Puyo-Canelos rd., km 30, Oct.; *Sucumbíos*: Laguna de Pañacocha Oct.; La Ormiga, Las Lagunas de Cuyabeno Sep.; Pañacocha Oct.; *Zamora-Chinchipe*: Chachacoma 1250m Nov.; Quebrada Chorillos 1250m Nov.; Zamora, ridge west of town 1450m May (Willmott & Hall, sight records). **BRAZIL**: *Amazonas*: Ilha de Maracá (Mielke & Casagrande, [1992]).

Adelpha cocala didia Fruhstorfer, 1915 **stat. rest.**

Figs. **101c,d**; *309*

Adelpha cocala didia Fruhstorfer (1915: 516)

TL: Espírito Santo [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Syntype ♂ Adelpha cocala didia Fruhstorfer G. Lamas det. 1987//Fruhstorfer Coll. B.M. 1937-285//Espírito Santo Brasil ex coll. H. Fruhstorfer//TYPE//Type//Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//Espírito Santo Brasil ex coll. H. Fruhstorfer//TYPE//Type"; **BMNH**(M): **ST**?♂&♀: "Espírito Santo Brasil ex Coll. H. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//cocala didia Fruhst."; **ST**?♂: "Espírito Santo Brasil//Fruhstorfer Coll. B.M. 1937-285"; **ST**?♂&♀: "Espírito Santo Brasil ex Coll. H. Fruhstorfer// Fruhstorfer Coll. B.M. 1937-285" [all examined]

Adelpha cocala riola ab. *chlide* d'Almeida (1931: 85) unavailable name

TL: Rio [Brazil]. **Types**: **Collection?**: **HT**♀: [not examined]
=*Adelpha cocala riola* Fruhst., Hall (1938), auctt., misid.; *Limenitis cocala riola* Fruhst., Brown & Mielke (1967)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. c. caninia* and *A. c.*

cocala under their respective accounts. Females typically have the basal half of the DFW band in cell 2A-Cu_2 paler yellow or whitish.

Fruhstorfer (1915) described this subspecies based on an unspecified number of specimens from Espírito Santo, and I have examined several syntypes in the BMNH (Fig. 101c,d). These do not differ from the paralectotype of *A. viola*, and Hall (1938) therefore synonymised *didia* with *viola*. However, the originally figured specimen of *viola*, the lectotype, is actually a distinct species from *A. cocala*, and therefore I reinstate *didia* as a valid subspecies (**stat. rest.**). D'Almeida (1931) described a female specimen from Rio, collected by himself, as a new aberration, *A. cocala riola* ab. *chlide*. This specimen apparently differs from typical *didia* in having more extensive orange on the DFW between the subapical spots and the upper postdiscal band. I have not seen the holotype and it may prove to be a specimen of *A. viola viola*, but since the name was proposed as a quadrinomial and an aberration, it is excluded by the Code and therefore unavailable.

Range: *Adelpha c. didia* ranges along the eastern coastal region of Brazil from Bahia to Rio de Janeiro, north into Minas Gerais and Mato Grosso (where some specimens are transitional to the nominate subspecies), and also occurs rarely in São Paulo, presumably intergrading with *A. c. caninia*.

Immature stages: D'Almeida (1931) described some of the early stages of "*A. cocala riola*" from Rio de Janeiro, but I believe these observations probably apply to *A. viola viola*.

Habitat and adult ecology: This subspecies is not uncommon in collections and specimen label data indicate that it may occur as high as 1500m. D'Almeida (1931) reports that it is common in August and September around Rio de Janeiro, but also present from February to July.

Specimens examined (53♂, 20♀): † - trans. to *A. cocala cocala.*
BRAZIL (51♂, 18♀): *Bahia*: Bahia 2♂ BMNH; *Distrito Federal*: Brasilia 1♀ USNM; *Espírito Santo*: Linhares Aug. 7♂, 2♀ AME; Santa Teresa Mar. 1♂ AME; no specific locality 4♂, 3♀ BMNH; *Mato Grosso*: Buriti May 2♂† USNM; Chapada 1♂ BMNH; Cuiabá, 90 km E., May 1♂† USNM; Tombador Falls 2000' Aug. 1♀ BMNH; no specific locality 1♂ BMNH; *Minas Gerais*: Leopoldina 1♂ ZMHU; Parque Rio Doce 1♂ AME; Tijuco 1♂ BMNH; no specific locality 1♂ BMNH; *Rio de Janeiro*: Corcovado 800' Feb. 1♀ BMNH, 1♀ AME; Petrópolis 900-1500m Jan. Mar. Apr. 6♂ AME, 1♂ MUSM; Rio de Janeiro Apr. 7♂ BMNH, 3♂, 2♀ ZMHU, 1♂ BMB, 1♂ MNHN, 3♂ USNM, 1♂ AMNH; *Santa Catharina*: no specific locality 1♂ BMB; *São Paulo*: Mendes 1♀ AME; São Paulo 2500' Feb. 1♀ BMNH, 1♀ BMB; *Not located*: no specific locality 2♂, 2♀ BMNH, 1♂, 1♀ BMB, 1♂, 1♀ MNHN. "**FRENCH GUIANA**" (1♂): *Cayenne*: Cayenne 1♂ MNHN-error. **COUNTRY UNKNOWN** (1♂, 2♀): no specific locality 1♂, 1♀ BMNH, 1♀ USNM.
Additional locality data: **BRAZIL**: *Distrito Federal*: Sobradinho Woods 1050-1150m Feb.; *Goiás*: Campinas 800m; Chapada dos Veadeiros 1000m; Leopoldo Bulhões 1000m; Vianápolis 1000m (Brown & Mielke, 1967).

Adelpha cocala caninia Fruhstorfer, 1915

Figs. **101e,f**; *309*

Adelpha cocala caninia Fruhstorfer (1915: 516)

TL: Santa Catharina to São Paulo [Brazil]. **Types**: **BMNH**(T): **ST**♂: "Syntype ♂ Adelpha cocala caninia Fruhstorfer G. Lamas det. 1987//Fruhstorfer Coll. B.M. 1937-285//Brasilien São Paulo Fruhstorfer// 528 1 88//TYPE//Type//Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//Brasilien St. Cath. Fruhstorfer//TYPE//Type"; **BMNH**(M): **ST**♀: "Brasilien St. Cath. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285//TYPE"; **ST**?♂: "Fruhstorfer Coll. B.M. 1937-285//Brasilien São Paulo Fruhstorfer"; **ST**?♂: "Brasilien Fruhstorfer//St. Catharina 88 Schmett.//cocala caninia Fruhst." [all examined]

=*Adelpha cocala riola* Fruhst., D'Almeida (1931) aberration, misid.; *Adelpha cocala caninia* Fruhst., Hall (1938)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. c. didia* by having the DFW band in cell 2A-Cu_2 white and a third the width of the remainder of the band. *Adelpha c. cocala* is also distinguished by this character, in addition to others discussed in that account. There is an apparently broad area of overlap of *A. c. caninia* and *A. c. didia*, from Rio de Janeiro to São Paulo, and presumably for this reason D'Almeida (1930) regarded the former as an aberration of the latter (as *A. c. viola*). However, given the paucity of precisely labelled specimens and the fact that each taxon seems to occupy a relatively large geographic area in which it is phenotypically stable, I retain the two taxa for the present as distinct.

Fruhstorfer (1915) described this taxon from an unspecified number of specimens from Santa Catharina to São Paulo in Brazil, and figured it as *cocala* (not *viola*, as stated in the text) on plate 106b (Fruhstorfer, 1913). The syntype specimen in the BMNH(T) (Fig. 101e,f) seems to be the specimen figured by Fruhstorfer.

Range: Southeastern Brazil from São Paulo to Santa Catharina, with several imprecisely labelled specimens from further north and east.

Habitat and adult ecology: This subspecies is not uncommon in collections and has been collected from August to April. D'Almeida (1931) reports that males are attracted to overripe bananas, while Hoffmann (1936) found it on the flowers of *Mikania*. Brown (1992) states that it occurs to over 1100m in the Serra do Japi, São Paulo, where it can be found within dense, humid forest or on more open hill tops.

Specimens examined (32♂, 16♀):
BRAZIL (32♂, 16♀): *Espírito Santo*: no specific locality 1♀ BMB; *Minas Gerais*: no specific locality 1♂ BMNH; *Paraná*: no specific locality 1♂ AMNH; *Rio de Janeiro*: Rio 1♂ BMB; *Santa Catharina*: Serrinha do Pirai, W. Joinville 950' Mar. 4♂ FSCA; Rio Natal, nr. Rio Vermelho 900-1450' Mar. & FSCA; Rio Julio, 30 km N.W. Joinville 2500' Mar. 1♀ FSCA; Blumenau 1♂, 2♀ BMNH, 1♂, 1♀ ZMHU; Joinville 20-200m Feb.-Apr. Dec. 4♂ MUSM, 1♂ USNM; Mastanduba?? Sep. 1♂ AME; São Bento do Sul 550-850m Feb.-Apr. 2♂, 1♀ MUSM, 1♂ AME; no specific locality 3♂, 1♀ AMNH, 1♂, 1♀ USNM, 1♂ BMNH, 1♂, 3♀ ZMHU, 1♂, 1♀ BMB; *São Paulo*: Alto da Serra Apr. Aug. 1♂ BMNH, 2♂ MNHN; São Paulo 2500' Nov. Dec. 2♂, 1♀ BMNH, 1♂, 1♀ BMB; *Not located*: no specific locality 1♂ BMNH, 1♀ AMNH.
Additional locality data: **BRAZIL**: *Santa Catharina*: Jaraguá Aug. Apr. (Hoffmann, 1936); *São Paulo*: Serra do Japi (Brown, 1992).

Adelpha cocala lorzae (Boisduval, 1870)

Figs. **101g,h**; 269a,b; *309*

Heterochroa lorzae Boisduval (1870: 46)

TL: Unknown. **OTL**: Guatemala. **Types**: **BMNH**(T): **LT**♂: "Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3//Godman vidit Janv. 1883//Heterochroa lorzae Bdv.//Typicum Specimen//Syntype//Type"; **BMNH**(M): **PLT**?♂: "Ex Musaeo Dris. Boisduval//Lorzae Bdv. Venezuel.//Ex Oberthür Coll. Brit. Mus. 1927-3" [both examined]

=*Adelpha cocalina* Fruhstorfer (1913: pl. 106b; 1915: 516) **stat. nov.**

TL: [Paramba, Ecuador]. **Types**: **BMNH**(R): **ST**?♂: "fufia cocalina Fruhst.//Paramba 3500' IV. 97 dry season (Rosenberg)//R//TYPE// Syntype"; **ST**?♀: "TYPE//Paramba 3500' III '97 dry season Rosenberg" [both examined]

=*Adelpha fufia* Fruhstorfer (1913: pl. 107b; 1915: 516) **syn. nov.**

TL: [Colombia]. **Types**: **BMNH**(T): **ST**♀: "fufia Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Columbien ex coll. H. Fruhstorfer//TYPE//Type// Syntype"; **ST**♀: "Fruhstorfer Coll. B.M. 1937-285//Columbien ex coll. H. Fruhstorfer//TYPE"; **BMNH**(M): **ST**?♂: "Fruhstorfer Coll. B.M. 1937-285//trinina fufia Fruhst.//Columbien ex coll. H. Fruhstorfer"; **BMNH**(R): **ST**♂: "Bogotá//R//fufia Fruhst." [all examined]

=*Adelpha cocala fufina* Fruhstorfer (1915: 516) **syn. nov.**

TL: Colombia. **Types**: **BMNH**(T): **ST**♂: "Syntype ♂ Adelpha cocala fufina Fruhstorfer G. Lamas det. 1987//Illustrated in The Butterflies of Venezuela A. Neild, 1996//41//Fruhstorfer Coll. B.M. 1937-285// Columbien ex coll. H. Fruhstorfer//TYPE//Type//Syntype"; **ST**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//42//Fruhstorfer Coll. B.M. 1937-285//Columbien ex coll. H. Fruhstorfer//TYPE//Type" [both examined]

Adelpha lorzae Boisd., Kirby (1871); =*Adelpha urraca* Fldr., Godman & Salvin (1884); *Adelpha cocala lorzae* Boisd., Fruhstorfer (1915); *Adelpha cocala cocala* Cram., D'Abrera (1987) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from all other subspecies (except *A. c. orellanae*) by having the postdiscal band on the

VFW tinged yellowish brown, the same colour as the postdiscal series. The colour is particularly distinctive in the upper postdiscal band, while the lower postdiscal band is often paler, particularly towards the anal margin. In addition, the subapical spots on the DFW are reduced or absent, while in all other subspecies (except *A. c. orellanae*) they are only slightly narrower than the upper postdiscal band. There is variation in the width of the orange DFW band, but after examining a long series from throughout the range of this subspecies I conclude that the variation is purely clinal, with specimens in the west (Mexico) having the narrowest bands, and those in the east having the broadest, particularly those from the Catatumbo region of Venezuela. There is also variation in the presence or absence, and the size of the orange DFW subapical dots, with western specimens typically lacking these dots, but eastern specimens having them best developed. South American specimens often have slight orange scaling in the anterior half of the DFW discal cell between cell bars two and four, and there is slight variation in the width of the white DHW postdiscal bands, these being typically narrowest in west Ecuadorian specimens.

Boisduval (1870) described this subspecies based on a single male and female from Guatemala, and a syntype male in the BMNH with the following data is designated as the lectotype for *Heterochroa lorzae*: "Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3//Godman vidit Janv. 1883//Heterochroa lorzae Bdv.//Typicum Specimen//Syntype//Type" (Fig. 101g,h). This is the specimen seen by Godman and apparently compared with the BMNH syntype of *urraca*, of which Godman & Salvin (1884) regarded *lorzae* a synonym. However, the lectotype is clearly a member of the Central American subspecies and matches Guatemalan specimens well, so I assume it has merely lost its original locality label. A further possible male syntype in the BMNH may be the original "female" referred to, but this bears a Venezuelan locality data label, so to avoid future confusion I have chosen to designate the former specimen as the lectotype. Fruhstorfer (1915) correctly reinstated the name *lorzae* as a subspecies of *cocala*, and went on to describe *fufina* as a new subspecies based on an unspecified number of specimens from Colombia, on the basis of a darker orange DFW postdiscal band. This character is barely apparent, and although Neild (1996) used the name *fufina* for northwest Venezuelan specimens, probably due to their broader orange DFW band compared with *A. c. lorzae*, for the reasons discussed above I regard *fufina* and *lorzae* as synonymous (**syn. nov.**). Fruhstorfer (1915) treated certain Colombian and west Ecuadorian specimens under the name *A. trinina*, as a species distinct from *A. cocala*, the former described from Trinidad and here placed as a synonym of *A. malea aethalia*. The differences cited, namely the reduced orange DFW subapical spots and yellowish brown VFW postdiscal band, are precisely the characters that distinguish this subspecies from the nominate, yet Fruhstorfer regarded both *lorzae* and *fufina* as subspecies of *A. cocala*. The genitalic differences given are simple individual variation. Fruhstorfer (1913) figured *A. fufia* and later placed it as a subspecies of "*A. trinina*", based on a number of Colombian specimens (Fruhstorfer, 1915), and I have examined several syntypes in the BMNH. The reduced orange DFW subapical spots in the original figure show the name to clearly apply to this taxon, and although D'Abrera (1987) accorded the name specific status, this was based on a misidentification, his figured specimen being *A. heraclea heraclea*, as pointed out by Neild (1996). Hall (1938) placed *fufia* as a subspecies of *A. cocala*, but Neild (1996) expressed considerable doubt as to whether *fufia* and *fufina* represented distinct taxa, and for the same reasons as with the name *fufina*, I synonymise *fufia* with *lorzae* (**syn. nov.**). Fruhstorfer (1913) figured a second new taxon, *cocalina*, which he also later treated as a subspecies of "*A. trinina*", based on a type specimen in the Tring Museum from Paramba, in Ecuador, at an altitude of 1200m (Fruhstorfer, 1915). There are two specimens in the BMNH(R) that could represent the supposedly unique syntype of this taxon, but there is no doubt as to its identity, the original figure clearly showing the small orange DFW subapical dots possessed by typical west Ecuadorian specimens. Although west Ecuadorian specimens typically have narrower white DHW postdiscal bands and the DFW subapical dots present, both characters are minor and variable. Hall (1938) placed *cocalina* as a synonym of *urraca*, apparently not realising that west Ecuadorian *A. cocala* is more closely related to Central American populations than Amazonian, and I therefore place the name as a synonym of *A. c. lorzae* (**stat. nov.**).

Range: Mexico (Oaxaca) to western Ecuador, to northwestern Venezuela west of the Cordillera de Mérida and along the northern coast as far as Puerto Cabello.

Immature stages: DeVries (1986) states that egg is grey and is deposited singly on damaged portions of old leaves in Costa Rica, usually with only a single egg per plant. Aiello (1984) also reported oviposition at damaged areas of leaves in Panama, but stated that more frequently the egg was deposited at the leaf tip on the upper surface. Aiello (1984) states that the egg is typical of the genus, and also figured the final instar larva and its head capsule (figs. 2, 4) and the pupa (fig. 6). Early fifth instars are mottled golden brown and black, and later the colours become green, black and cream, with a pinkish grey and black area on the dorsal surface of A3-A6, and a broad, oblique lateral pinkish or yellowish stripe across A4 and A5. Some individuals have a subspiracular lime green mark on A7 and A8. All scoli are relatively thick, long and well developed, more so on T2, T3, A2, A7 and A8, and the subspiracular scoli are also well developed. The head capsule is marked with dark pits and has well developed chalazae and lateral spines. The pupa is dark green and has a rather anteriorly pointed dorsal projection on A2, while the head horns are leaf shaped and laterally pointing. This taxon was also reared by DeVries (1987) in Costa Rica, and his brief descriptions are consistent with Aiello's observations. There are head capsules and pupal cases in the USNM, collected by Small in Panama.

In Costa Rica, larvae are solitary and feed on old leaves of plants along forest or river edges, in primary forest or in forest light gaps. Early instars make frass chains extending the leaf veins, while later instars rest on the pile of accumulated fecal material at the leaf base (DeVries, 1987). Development times for the various stages in Panama were listed by Aiello (1984), the total development time being 35-39 days. Label data on a reared Costa Rican specimen in the PJD indicates that the development times were as follows: 3rd instar, 2 days; 4th instar, 4 days; 5th instar, 6 days; pupa, 9 days.

Habitat and adult ecology: This subspecies, like the nominate, is generally widespread and very common in lowland forest habitats up to 900m. Apparently, however, it is scarce in Mexico, where it has been reported from 100-300m in humid lowland rain forest from June to October (de la Maza, 1987; de la Maza & de la Maza, 1993), and it appears to be a relatively recent discovery for that country, being unreported by Hoffmann (1940). DeVries (1987) reports that the species is common in Costa Rica in areas of swamp forest and along rivers, and that males commonly perch in light gaps and along forest edges from early morning to late afternoon, in periods of sun. Females search for oviposition sites on seedlings and small saplings around midday, along rivers or in the forest understorey, while both sexes feed at rotting fruits, and males at mammal dung. Andrés Orellana (pers. comm.) observed individuals feeding on fermenting fruit of *Bunchosia cornifolia* (Malpighiaceae) in August, in Panama. In western Ecuador, I have found males along ridge tops, river sides and within flat rain forest, where they are readily attracted to traps baited with rotting fish, and perch in a similar manner to the nominate subspecies. I have also observed a single female searching for oviposition sites in large tree fall light gap at around 2.40pm. Although present throughout the year, adults are most abundant in the wet season and early dry season.

Specimens examined (260♂, 111♀):

MEXICO (8♂, 3♀): *Chiapas*: Pichucalco Aug. 1♂ AME; *Colima*: Colima 2♂, 1♀ BMB; *Oaxaca*: Chimalapa Jun.-Oct. 3♂, 2♀ AME; *Oaxaca*: Jaltepec Oct. 1♂ AME; Totontepec Jun. 1♂ AME. **GUATEMALA** (10♂, 3♀): *Alta Verapaz*: Polochic Valley 3♂, 1♀ BMNH; *Baja Verapaz*: Panimá 1♀ BMNH; *Escuintla*: Palín 3600' Jul. Aug. 1♂ BMB; *Izabal*: Cayuga 3♂, 1♀ USNM; Puerto Barrios Dec. 1♂ BMB; Quiriguá 4-5000' Jul. Aug. 1♂ BMNH, 1♂ BMB; *Not located*: no specific locality 1♂ ZMHU. **HONDURAS** (15♂, 3♀): *Atlántida*: La Ceiba, 18 km W., Jul. 1♀ USNM; *Cortés*: La Cumbre Jan. 6♂ BMNH, 4♂ BMB; San Pedro Sula 1♀ BMNH; *Not located*: no specific locality 2♂, 1♀ ZMHU, 2♂ BMB, 1♂ USNM. **NICARAGUA** (3♂, 1♀): *Chontales*: Chontales 2♂, 1♀ BMNH; *Not located*: no specific locality 1♂ BMNH. **COSTA RICA** (13♂, 15♀): *Alajuela*: Las Pavas 3000' Nov. 1♂ BMB; San Mateo Sep. 1♀ BMNH; *Cartago*: Juan Viñas Sep. Oct. 3♂ BMB; Turrialba May Aug. Sep. 2♀ USNM, 2♂ AME; *Heredia*: Puerto Viejo, 3 km S.W., Jan. 1♂ USNM; Río Sucio 500m Sep. 1♀ KWJH; *Limón*: Guápiles Mar. May Jun. 1♂, 5♀ USNM, 1♂, 1♀ BMNH; Limón Jan. Nov. 1♀ USNM, 1♂ BMNH; Santa Clara Jan. 1♀ USNM; *Puntarenas*: Palmar Norte Aug. 1♂, 1♀ USNM; *San José*: Villa Colón Aug. 1♀ USNM; *Not located*: no specific locality 1♂, 1♀ BMNH, 1♂ BMB. **PANAMA** (77♂, 31♀): *Chiriquí*: Bugaba 800-1500' 9♂, 1♀ BMNH, 1♂ USNM; Chiriquí 25-4000' Feb. 1♂, 4♀ BMNH, 4♂, 3♀ ZMHU, 2♀ USNM, 2♂ BMB, 1♀ MCZ; Puerto Armuelles Sep. 1♀ AMNH; Río Tolé 120m Feb. 1♀ USNM; *Colón*: Colón 1500' Jan. 1♂ AME, 2♂ USNM; Gamboa Jul. Oct. 1♂ USNM, 1♂ BMNH, 1♂ AME; Gatún Jan.-Apr. Jun. Aug. Nov. 5♂, 3♀ USNM; Lion Hill 1♀ BMNH; Piña Mar. May-Aug. Nov. Dec. 3♂, 1♀ FSCA, 25♂, 2♀ AME; Porto Bello Apr. 1♀ USNM; *Darién*: Caña 750m May-Jul. 400m 2♂, 1♀ USNM; Río Tuguesa Sep. 1♀ USNM; *Herrera*: Cerro Montuoso 850m Apr. 1♂ USNM; Chepo Feb. 1♂ USNM; *Panamá*: nr. Altos de Pacora Mar. 1♂ USNM; Balboa Jan. 1♂ AME; Barro Colorado Island Mar. May 1♂, 2♀ AMNH, 1♂ USNM; Bayano Nov. 1♂ USNM; Cerro Jefe Sep. 1♀ USNM; Cocolí Sep. 1♂ USNM; El Llano, 7 mi. N., Oct. 1♂, 1♀ USNM; Farfán Jul. 1♂ USNM; Las Cumbres Oct. 1♂ FSCA; Madden Forest Feb. Mar. Aug. 2♂, 1♀ USNM; *Veraguas*: Ballena 1♂ USNM; Veraguas 2♀ BMNH; *Not located*: Los Ríos, Canal zone Feb. 1♂ USNM; Madden Dam Jul. 2♂ AME; no specific locality Jun. 2♂, 1♀ FSCA. **COLOMBIA** (98♂, 33♀): *Antioquia*: Casabe, Río Magdalena Oct. Nov. 1♂, 1♀ AMNH; Crystallina 1100' Jun. Jul. 1♀ BMB; Medellín 2♂ BMB; Ríodaro Refugio Ecológico Jan. 1♂ MHNUC; *Boyacá*: Muzo 3♂, 2♀ BMNH, 7♂, 2♀ BMB, 1♂ USNM, 1♀ MCZ; Otanche Jan. May 2♂, 1♀ JFL; *Caldas*: Río de la Miel 1♂ ESM; Río Guarimo, Victoria 1000m Nov. 1♀ MHNUC; Victoria Aug. 1♀ USNM; *Chocó*: Bahía Solano Jan. 1♂ JFL; Río Condoto Feb. 1♂, 1♀ BMNH; Río San Juan 1♂ ZMHU; Tadó Mar. 2♂ JFL; *Cundinamarca*: Bogotá 27♂, 4♀ BMNH, 1♀ AMNH, 1♂ ZMHU, 3♂, 1♀ BMB, 2♂ MNHN, 3♂, 1♀ USNM; env. de Bogotá 2♂, 1♀ BMNH; Cananche 6♂, 3♀ BMNH; Veragua 1♂ MNHN; *Risaralda*: Hda. Bacorí, Pblo. Rico 450m Oct. 1♂ MHNUC; Itaburi 1000m Jan. 1♀ AMNH; *Santander*: La Santa Marta, Río Opón region 1000-1200m Nov. 1♂ AMNH; *Tolima*: Río Chili Apr.-Jun. 2♂ BMB; *Valle del Cauca*: Río Tatabro Jul. Dec. 4♂, 2♀ LMC; *Not located*: Cauca 2♀ AMNH; Guamia Sep. 1♂ LMC; no specific locality 12♂ AMNH, 2♂, 4♀ BMNH, 2♂, 1♀ MCZ, 1♀ ZMHU, 5♂ BMB. **VENEZUELA** (10♂, 9♀): *Carabobo*: Puerto Cabello 1♂, 1♀ ZMHU; San Esteban Jul.-Sep. 3♂, 3♀ BMNH, 1♂, 1♀ BMB, 1♂ MNHN; Yuma 500-550m Feb. May 1♂ USNM, 1♂ MUSM; *Mérida*: Mérida 1♂ ZMHU; *Táchira*: San Juan de Colón 550m Jun. 1♀ AFEN; *Trujillo*: La Gira Betijoque 540m Dec. 1♀ AFEN; *Zulia*: La Kasmera Dec. 1♀ MUSM; *Not located*: no specific locality 1♀ MNHN, 1♂ AMNH. **ECUADOR** (15♂, 10♀): *Esmeraldas*: Cachabé 2♂, 3♀ BMNH; La Punta km 44 Lita-San Lorenzo rd. Aug. 1♂ KWJH; San Lorenzo-Lita rd., km 18, Aug. 1♂ KWJH; *Imbabura*: Paramba 3500' Mar. Apr. dry season 2♂, 5♀ BMNH; *Manabí*: Palmar 200m Apr. 5♂ AMNH; *Pichincha*: Río Tanti Aug. 2♂ KWJH; Sto. Domingo 1♀ MNHN; *Not located*: Oriente 2♂, 1♀ AMNH-error. "**FRENCH GUIANA**" (1♂): *Cayenne*: St. Georges 1♂ MNHN-error. "**BRAZIL**" (1♂): no specific locality 1♂ MNHN-error. **COUNTRY UNKNOWN** (9♂, 3♀): no specific locality 7♂, 2♀ MCZ, 2♂ BMNH, 1♀ BMB.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva (de la Maza & de la Maza, 1993); *Oaxaca*: Palomares; Sarabia (de la Maza, 1987). **ECUADOR**: *Carchi*: Lita, ridge east of Río Baboso 900m Mar. Jul.; *Esmeraldas*: Anchayacu 1000m Jul.; El Durango Mar. Jul.-Sep.; El Encanto Jun.; El Placer Sep.; Finca Doña Bella 400m Sep.; Finca Durán, nr. Alto Tambo 600m Jul.; La Punta Mar. Jun.; Mina Vieja, c. km 46 Lita-San Lorenzo rd. 300m Jul.; Río Piguambí Jul.; San Lorenzo-Lita rd., km 17, Dec.; San Lorenzo-Lita rd., km 20, Aug.; San Miguel Jun. Aug. (Willmott & Hall, sight records).

Adelpha cocala orellanae Neild, 1996

Figs. **101i,j**; *309*

Adelpha cocala orellanae Neild (1996: 34, pl. 1, figs. 44-46)

TL: Río Frío [Táchira], Venezuela. **Types** (all Venezuela): **TP/MIZA**: **HT**♂: Río Frío 9 Sep. 1988 [original photograph examined]; **BMNH**(M): **PT**♂: Río Frío, P.N. El Tamá, Táchira; **AFEN**: **PT**♀: Río Negro Táchira Jun. 1987, *leg.* T. Pyrcz [both examined]; **TP**: **PT**♀: Río Frío, P.N. El Tamá 600m Jun. 1987; **PT**♂: same locality as preceding, 9 Sep. 1989; **DLF**: **PT**♂: Quebrada Rincón, 800m, Barinitas, Barinas; **RM**: 2**PT**♂: same locality data as HT, 31 Oct. 88; **PT**♀: same locality data as preceding, 30 Oct. 1988; **JCS**: **PT**♂: El Blanquito, P.N. Yacambú, Lara, 1350m, 22 Dec. 1987, *leg.* Juan Carlos de Sousa [not examined]

Identification, taxonomy and variation:

This subspecies is distinguished from all others by the orange band distal of the white DHW postdiscal band. The yellow-brown VFW postdiscal band and reduced orange DFW subapical spots are both characters shared with *A. c. lorzae*, which otherwise does not occur east of the Andes.

Neild (1996) clearly described and figured this subspecies and I have examined the original illustration of the holotype and two further paratypes (Fig. 101i,j). Since the taxon is named for Andrés Orellana, Gerardo Lamas (pers. comm.) is of the opinion that name should represent the latinised genitive of Orellana, namely *orellanai*. However, Neild regarded the name Orellana as a Latin name and therefore the genitive ending *–ae* is equally correct, and I retain it here.

Range: Eastern foothills of the Cordillera de Mérida, from the extreme north to near the Colombian border. The obvious sister taxa relationship with the Transandean *A. c. lorzae* illustrates the mixed biogeographical affinities of the Apure region of Venezuela, which also contains a number of typically Amazonian taxa.

Habitat and adult ecology: This subspecies is apparently locally not uncommon in its limited range, and has been recorded up to 1350m. The orange DHW band occurs in a number of other sympatric *Adelpha* taxa (listed under *A. cytherea nahua*), with which this species is almost certainly involved in mimicry.

Specimens examined (2♂, 4♀):

VENEZUELA (2♂, 4♀): *Barinas*: Reserva Forestal Ticoporo 230m Apr. 1♂, 3♀ MUSM; *Táchira*: Río Frío, P.N. El Tamá 600m Oct. 1♂ BMNH; Río Negro Jun. 1♀ AFEN.

Additional locality data: **VENEZUELA**: see type data above (Neild, 1996).

Adelpha felderi (Boisduval, 1870)

Figs. **102a,b**; 193a,b; 270a,b; *310*

Heterochroa felderi Boisduval (1870: 45)

TL: Costa Rica. **Types**: **BMNH**(T): **ST**♀: "Ex Musaeo Dris. Boisduval//Ex Oberthür Coll. Brit. Mus. 1927-3//=adelpha falcata G. & S.//Vu par Godman en Janvier 1883//Heterochroa felderi Bdv. Costa Rica//Typicum Specimen//Type//Syntype"; **BMNH**(M): **ST**♂: "felderi Guat.//Ex Musaeo Dris. Boisduval//Felderi Bdv.//Ex Oberthür Coll. Brit. Mus. 1927-3" [both examined]

=*Adelpha falcata* Godman & Salvin (1878a: 270) **stat. rest.**

TL: Valley of the Río Polochic, Guatemala. **Types**: **BMNH**(T): **ST**♂: "B.C.A. Lep. Rhop. Adelpha felderi Boisd. Godman-Salvin Coll. 1916.-4.//B.M. TYPE No. Rh. 9842 Adelpha falcata G. & S.//sp. figured//Valley of the R. Polochic Hague//♂//Polochic Valley F.D.G. & O.S.//Type//Syntype" [examined]

=*Adelpha felderi jarias* Fruhstorfer (1915: 527) **syn. nov.**

TL: Mexico. **Types**: **BMNH**(R): **ST**?♀: "? Syntype ♀ Adelpha felderi jarias Fruhstorfer G. Lamas det. 1987//? Syntype//Cuesta de Misantla, Mex. VI '96 (Schaus)//Adelpha felderi Bdv. Cuesta de Misantla June 96" [examined]

Adelpha felderi Boisd., Kirby (1871); *Limenitis (Adelpha) felderi* Boisd., Ross (1976); *Adelpha felderi jarias* Fruhst., de la Maza (1987), de la Maza & de la Maza (1993); *Adelpha felderi falcata* G. & S., de la Maza & de la Maza (1993)

Identification, taxonomy and variation:

This is a distinctive species, bearing a superficial resemblance to *A. iphiclus*, *A. iphicleola* and perhaps *A. naxia*, but distinguished from the former two by the shape of the orange DFW subapical marking, from the latter by the absence or great reduction of the orange DFW subapical spot at the costa, and from these and all other similar species by the rich reddish brown ventral coloration, the two bright, rounded silvery white VFW subapical spots, the yellowish VFW upper postdiscal band which is isolated from the much darker orange-brown postdiscal series in cell M_3-M_2, and the black line bordering the distal edge of the white postdiscal band on the ventral surface. There is slight individual variation in the presence and extent of orange scaling in cell Cu_1-M_3 on the DFW, while there may be slight orange subapical scaling in cell M_1-R_5, and the silvery grey spots of the VHW inner submarginal series may be broad ovals or reduced dashes.

Boisduval (1870) described this species based on a male specimen supposedly from Costa Rica, and stated that the female resembled the male. The detailed description and syntype male and female in the BMNH clearly represent this taxon, but the type locality is almost certainly incorrect. The original description appeared in a work entitled "*Considerations sur des lépidoptères envoyés du Guatemala à M. de l'Orza*", and I suggest that the only two specimens of this species labelled from Costa Rica, namely the syntype female and a second female in the BMNH, are actually from Guatemala. The second putative Costa Rican female in the BMNH lacks a label indicating it to be from the collection of Boisduval, but since it has a label indicating it to be from Oberthür's collection it still may be a Boisduval specimen that has lost the former label. I have seen no specimens of the species east of Honduras, and DeVries (1987) never reported it from Costa Rica, despite the species being highly distinctive and apparently common everywhere else that it is known to occur. Without reference to *felderi*, Godman & Salvin (1878a) described *falcata* as a species based on specimens in their collection from the Río Polochic valley in Guatemala. I have examined a syntype and further three males and three females in the BMNH(M) from the type locality, from Godman & Salvin's collection, which are probable syntypes. Godman & Salvin (1884) subsequently noted that *falcata* was synonymous with *felderi*, but Fruhstorfer (1915) and later authors (de la Maza & de la Maza, 1993) have used the name without justification and I therefore restore *falcata* as a synonym of *felderi* (**stat. rest.**). Fruhstorfer (1915) also went on to describe a further new subspecies, *jarias*, based on an unspecified number of specimens from Mexico, which supposedly differed from *felderi* in having an orange postdiscal spot in cell Cu_1-M_3 on the DFW. In fact, orange scaling is present in cell Cu_1-M_3 on the DFW of the syntype female of *felderi*, and although two males and a female from Cuesta de Misantla and a female from Córdoba (both in Veracruz) in the BMNH have orange scaling in cell Cu_1-M_3 on the DFW, this character is variable even in these localities and throughout the range of the species. No syntypes are known with certainty, but since there are otherwise no Mexican populations that merit separate subspecific recognition, I synonymise *jarias* with *felderi* (**syn. nov.**).

Adelpha felderi is probably most closely related to *A. cocala*, *A. irmina* and *A. leucophthalma*, as discussed under *A. cocala*. It shares with the latter two the reduction of the inner submarginal series on the VFW in cell Cu_1-M_3 and its loss in M_3-M_2, suggesting it may be most closely related to these two species. It is perhaps of interest that *A. felderi* and *A. leucophthalma* are parapatric in central America and the two may be sister species. However, it is also possible that *A. leucophthalma* and *A. irmina* are sister taxa, and given the additional extensive wing pattern differences between *A. felderi* and *A. leucophthalma*, there seems no good reason to regard them as conspecific.

Range: This species is known from Mexico, as far north as Tamaulipas, to Honduras. The two Costa Rican records are almost certainly mislabellings (see discussion above).

Habitat and adult ecology: This species is not uncommon throughout its range, and in Mexico it has been reported in lowland rain forest from 100-900m from March to November, with most records from the middle of the year (de la Maza, 1987; de la Maza & de la Maza, 1993). Austin *et al.* (1996) state that the species flies during the driest months from December to July in the Tikal area in Guatemala, where it is common in both primary and disturbed subtropical dry forest.

Specimens examined: 80 (53♂, 27♀)

MEXICO (39♂, 19♀): *Chiapas*: Bonampak May 1♀ AME; Comitán Mar. Aug. Sep. 7♂, 3♀ AME; Palastino Nov. 1♀ AME; Rancho Santa Ana 2♂ AMNH; Saltepec Oct. 1♀ AME; no specific locality 7♂, 3♀ AMNH; *Oaxaca*: Chiltepec Aug. 1♂ AME; Jaltepec Aug. 1♀ AME; Totontepec Jun. 1♂ AME; *Tabasco*: Tepescuintla Sep. 6♂ AMNH; *Tamaulipas*: San Francisco Jul. 1♂ AME; *Veracruz*: Catemaco Apr. May Aug. 1♂ FSCA, 1♂, 1♀ AME; Córdoba 1♀ BMNH; Cuesta de Misantla 3♂, 2♀ BMNH; Dos Amates Sep. 1♂ AME; El Vigía Apr. Jul. Aug. 3♂, 2♀ AME; Fortín 1♀ ZMHU; Presidio Jun. Jul. Dec. 2♂ AMNH, 2♀ AME; Tezonapa Jul. Oct. 1♂ AMNH, 1♂ AME; *Not located*: no specific locality 1♂ MNHN. **BELIZE** (3♂): no specific locality 1♂ BMNH, 2♂ BMB. **GUATEMALA** (9♂, 5♀): *Alta Verapaz*: Cubilguitz 1♂ BMNH; Polochic Valley 4♂, 3♀ BMNH; Sinanja 1♀ BMNH; Tucurú Mar. 1♂ BMNH; *Baja Verapaz*: Panimá 1♂, 1♀ BMNH; *Not located*: no specific locality 2♂ ZMHU. **HONDURAS** (1♂): *Atlántida*: La Ceiba, Cangrejal River Feb. 1♂ USNM. "**COSTA RICA**" (2♀): no specific locality 2♀ BMNH-error?. **COUNTRY UNKNOWN** (1♂, 1♀): probably Mexico 1♀ USNM; no specific locality 1♂ BMNH.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Selva Lacandona (de la Maza & de la Maza, 1993); Malpaso; *Oaxaca*: Jacatepec; Palomares; *Veracruz*: Uxpanapa (de la Maza, 1987); 3.5 mi. S.W. Sontecomapan 300m Jul.; 1 mi. N.E. Ocotal Chico 800m Jul. (Ross, 1976); Est. Biol. Los Tuxtlas (Raguso & Llorente, 1991). **BELIZE**: *Cayo*; *Toledo* (Meerman, 1999).

Adelpha leucophthalma (Latreille, [1809])

Figs. **103**; 194; 271; *310*

Identification, taxonomy and variation:

This species may be superficially similar to subspecies of several others, including *A. irmina*, *A. saundersii*, *A. zina*, *A. justina*, *A. salmoneus*, *A. ethelda*, *A. boreas* and *A. salus*. It is distinguished from the majority of these by the orange-brown ventral ground colour and two isolated silvery white VFW subapical spots, in addition to the absence of silvery grey submarginal markings distal of the pale yellow oblique band in cells 2A-Cu_2 to M_3-M_2 on the VFW. It is most similar to *A. irmina*, but differs in having the distal edge of the orange DFW band indented in cell M_3-M_2, instead of produced distally (i.e., the postdiscal series are not visible on the DFW), the basal edge of the upper postdiscal band in cell M_3-M_2 on the VFW is contiguous with the postcellular bar, instead of separated by silver-grey scaling, and the pale yellow postdiscal spot in cell Cu_1-M_3 on the VFW, representing the fused postdiscal band and postdiscal series, is entire, instead of split by darker brown scaling. *Adelpha leucophthalma* always lacks white scaling representing the postdiscal band in cell 2A-Cu_2 on the VHW, and if there is a white costal postdiscal spot, it is smaller than a similar postdiscal spot in cells M_3-M_2 and M_2-M_1; the latter spot is always absent or very tiny in *A. irmina*, while the costal spot is always well developed. *Adelpha saundersii* is distinguished under that species. There is variation in the presence and size of a white postdiscal spot on the DHW, and three subspecies are recognised, one of which is described here.

The absence of sclerotised bands on the corpus bursae in the female genitalia, the male genitalia which have spines at the posterior tip, as well as several wing pattern characters, including the isolated white VFW subapical spots and the displaced silvery grey submarginal marking on the VHW in cell M_3-M_2, suggest that this species is closely related to *A. cocala*, *A. felderi* and *A. irmina*, and probably *A. saundersii* and *A. lamasi* (see discussion under those species). There are shared characters between *A. leucophthalma* and *A. irmina*, including the entire loss in both these species of the submarginal and postdiscal series on the VFW except in cell M_2-M_1 to the apex, but other wing pattern similarities may be due to convergence. The loss of the white postdiscal band on the DHW in *A. leucophthalma* seems to have proceeded via its reduction in cells Cu_2-Cu_1, Cu_1-M_3 and M_1-Rs, then being entirely lost in *A. l. irminella*, while in *A. irmina*, inspection of the VHW suggests it has been lost first in cells M_3-M_2 and M_2-M_1, and that the reduction of the white DHW postdiscal band in both of these species may therefore not be homologous. Nevertheless, the close allopatry of the two species in northwestern South America still admits the possibility that they are sister taxa. A further possibility is that *A. leucophthalma* is the sister species of *A. felderi*, which appears to replace it in western Central America, while *A. irmina* may be derived from *A. cocala* (see discussion of a possible hybrid specimen in the USNM under *A. irmina*). Given the lack of firm evidence of the phylogenetic relationships among these four taxa, I prefer to treat all as distinct species.

Range and status: Nicaragua to western Ecuador, throughout Colombia west of and along the western slopes of the Cordillera Oriental. The species has yet to be recorded in the Sierra Nevada de Santa Marta or Sierra de Perijá, where its close relative *A. irmina* occurs. Common in montane areas from premontane forest at 500m to cloud forest at 2700m.

Specimens examined: 312 (236♂, 76♀)

Adelpha leucophthalma leucophthalma (Latreille, [1809])

Figs. **103a,b**; 194a,b; 271a,b; *310*

Nymphalis leucophthalma Latreille ([1809]: 247, pl. 25, fig. 3, 4)

TL: "near Guangamarea, Peru"-erroneous. **Types**: **BMNH**(T): **ST**♀: "Ex Oberthür Coll. Brit. Mus. 1927-3//Ex Musaeo Dris. Boisduval//Nymphalis leucophthalma, Latreille (Recueil d'Observations de Zoologie; 1er Vol. page 247, fig. 3)//Leucophthalma Latr. Humboldt. Perou//Syntype" [examined]

=*Heterochroa mephistopheles* Butler (1869: 7)

TL: Bogotá [Colombia]. **Types**: **BMNH**(T): **ST**♂: "B.M. TYPE No. Rh. 9804 Heterochroa mephistopheles ♂ Butl.//B.C.A. Lep. Rhop. Adelpha leucophthalma Latr. Godman-Salvin Coll. 1916.-4.//H. mephistopheles Butler type// Druce Coll. & Kaden Coll.//♂//Bogotá Colombia Druce Coll.//Type//Syntype" [examined]

=*Adelpha leucophthalma tegeata* Fruhstorfer (1915: 514)

TL: Colombia. **Types**: **BMNH**(T): **ST**♀: "Fruhstorfer Coll. B.M. 1933-131//leucophthalma tegeata Fruhst.//Columbien ex coll H. Fruhstorfer// TYPE//Type//Syntype" [examined]

Heterochroa leucophthalma Latr., Westwood (1850); *Adelpha leucophthalma* Latr., Kirby (1871); *Adelpha mephistopheles* Butl., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. l. smalli* under that subspecies, and from *A. l. irminella* by having a large, rounded white postdiscal spot on the DHW in cells M_3-M_2 and M_2-M_1. The white costal spot on the DHW may or may not be present. Central American specimens tend to have slightly less rounded wings, a thinner orange DFW band and a smaller white spot on the DHW, but these differences are minor and subject to too much variation to warrant the recognition of a distinct subspecies.

Latreille ([1809]) described and figured this species based on an unspecified number of specimens which he stated were collected in Peru, on the western slope of the Andes, in approaching from the sea to the south, near Guangamarea. The plate, showing the dorsal and ventral surfaces, is very accurate and several diagnostic characters are clearly visible, including the two silvery white VFW subapical spots and the rounded white DHW spot in cells M_3-M_2 and M_2-M_1 ending broadly along vein M_3. Boisduval (1870) mentions that the type specimen of *leucophthalma*, then in his collection, was flattened in a book by Humboldt and in poor condition, and this is clearly the specimen now in the BMNH(T). It is typical of the Colombian region, where it was probably collected, since the taxon is unknown from Peru or western Ecuador. Butler (1869) described *mephistopheles* as a distinct species with no mention of *leucophthalma*, from an unspecified number of specimens from the collection of Kaden in Druce's collection, originally collected in Bogotá. The description clearly refers to this taxon as confirmed by the syntype male in the BMNH, and Hall (1938) correctly synonymised *mephistopheles* with *leucophthalma*. Fruhstorfer (1915) described *tegeata* based on several Colombian specimens which were distinguished by a larger size, a paler orange DFW band and a darker VHW. All of these characters represent individual variation, and both Hall (1938) and DeVries (1987) treated the name as a synonym of *leucophthalma*. The name "pantarheia", listed by Martín *et al.* ([1923]) as a subspecies of *A. leucophthalma*, is a *nomen nudum*.

Range: Nicaragua to Colombia, on both slopes of the Cordilleras Occidental and Central, and the western slope of the Cordillera Oriental.

Immature stages: Young (1975) was the first to rear this species, in Costa Rica, and described and figured (in black and white) all of the early stages in admirable detail, summarised here. He collected two eggs from the upper surface of old leaves of a single sapling, one laid near the leaf edge, the other at the edge of a hole. DeVries (1987) also adds that the eggs are deposited singly with usually only one per plant, on seedlings or saplings in primary forest or light gaps, forest edges, and river sides. The egg is bluish white and morphologically typical of the genus. The first instar is light green with an orange head, the second dark green with a dark reddish brown head, with tubercles marking the future scoli on segments T2, T3, A2 and A7. The third instar is mottled dark brown and grey and has a dark brown head with white chalazae and spines, and the fourth instar is similar, developing a pale grey dorsal "saddle" marking on segments A5-A7. The head capsule is patterned with dark and light markings, and the corona of chalazae is further developed, as are the scoli, which are dark brown. The fifth instar has well developed subspiracular scoli, while the supraspiracular series appear to be reduced except on T2; all of the scoli are dull green, and the body also has some green patterning. The principle scoli, on T2, T3, A2, A7 and A8, are relatively thick with lateral spines, while remaining scoli are similar in form but narrower and shorter. The fifth instar apparently strongly resembles a section of moss-covered twig, and is said to be indistinguishable from that of *A. cocala* (Aiello & Small, *In*: Aiello, 1984). The pupa is dark brown with silver flecks, or it may be copper coloured (Aiello, 1984), bears a prominent, roughly triangular projection on A2 which almost touches the rather pointed projection on T2, and has broad, laterally curving and pointed head horns.

The first instar, on hatching, immediately eats the egg shell and then the leaf, leaving the midrib, which it extends in the usual manner, weaving a silken mat around the midrib extending onto the leaf surface. The larva always returns to this rib if disturbed while feeding. The fifth instar typically rests near damaged portions of the leaf, on both upper and under surface, the latter being a behaviour unreported in the genus, possibly induced by the laboratory rearing conditions. The larva feeds from the edge rather than the leaf tip, and if disturbed adopts the Front-Arched-Rear-Up position (Aiello, 1984). Earlier instars also rest in the Front-Curved position when on the midrib perch. DeVries (1987) also observed the early stages of this species in Costa Rica and states that the larvae are solitary and feed on all leaves of the hostplant.

Development times for the second instar onwards are given by Aiello (1984: table 2), while Young (1975) also notes times for the egg, larval period and pupa, giving a total development time of 51 days.

Habitat and adult ecology: Despite the claims of rarity by Young (1975), this subspecies is common in collections and the field, and DeVries (1987) gives a good summary of the species in Costa Rica. It occurs there from 500-1800m in all forest habitats, particularly cloud forest, where males perch from early morning to mid afternoon along forest edges. Young (1975) also observed males perching from 4-10m above the Río Sarapiquí, in Costa Rica. Females oviposit during the middle of the day on juvenile hostplants along trails and forest and river edges. Both sexes visit rotting fruits and males are commonly found on dung or puddling at wet sand. DeVries (1987) states that individuals are most abundant during the dry season, but this may partly reflect when they are most often encountered, since I have also found the species to be common during rare sunny spells in the middle of the wet season in Costa Rica. Andrade (1994) observed individuals feeding at flowers of Asteraceae in Colombia.

Specimens examined (213♂, 67♀):
NICARAGUA (3♂): *Chontales*: Chontales 3♂ BMNH. **COSTA RICA** (33♂, 16♀): *Alajuela*: Río Angel, nr. Cariblanco 750m Aug. 1♂, 2♀ KWJH; *Cartago*: Cachí 4♂ BMNH; Irazú 6-7000' 1♀ BMNH; Juan Viñas Aug.-Oct. 1♂ BMNH, 1♂ BMB; Moravia de Chirripo May 1♂ FSCA; Turrialba 2000' May-Aug. 5♂, 1♀ FSCA, 13♂, 2♀ AME, 3♂ USNM; *Heredia*: Cuesta Angel Dec. 1♀ AME; Puerto Viejo 1300m Jun. 1♀ AME; *Puntarenas*: Peña Blanca 3-4000' 1♀ BMNH; San Vito de Java 1150m Jan. Aug. Sep. 2♀ FSCA, 3♂ USNM; *San José*: Carrillo 1♂, 1♀ BMNH, 3♀ USNM; *Not located*: no specific locality 1♀ ZMHU. **PANAMA** (17♂, 17♀): *Chiriquí*: Cerro Colorado 1450m Aug. 1♀ USNM; Chiriquí 1♂ BMNH, 2♀ ZMHU, 1♂ MCZ; Potrerillos 3600' Mar. 1♀ USNM; Santa Clara 1200m Aug. Sep. 1♂, 2♀ USNM; *Coclé*: El Valle Aug. 1♀ BMNH, 1♀ AME; *Darién*: Caña 900-1550m May-Aug. 6♂, 3♀ USNM; Cerro Pirre 500m Jun. Jul. 1♂, 3♀ USNM; *Panamá*: Altos de Pacora 750m Apr. 2♂ USNM; Cerro Campana 2500' May Aug. Sep. 1♂ FSCA, 1♂ MCZ, 3♂, 3♀ USNM. **COLOMBIA** (151♂, 29♀): *Antioquia*: Antioquia 1♂ BMNH; Frontino 1♂ BMNH; Medellín 1♂ BMB; Salinas 4-8000' Jul. 2♂ BMB; Valdivia 1♀ BMNH; *Boyacá*: Muzo 8500' Jun. Jul. Sep. Oct. 1♂ BMNH, 5♂, 1♀ AME, 10♂, 2♀ BMB; Otanche Feb. Jul. Oct. 1♂, 2♀ JFL; *Caldas*: Bocatoma, Manizales 2250-2400m Aug. 2♂ MHNUC; Manizales 1♂ BMNH; Victoria Jun. 2♂ ESM; *Cauca*: Popayán 2♂ BMB; *Chocó*: Río Habito 800m Nov. 1♂ JFL; *Cundinamarca*: Bogotá 34♂, 6♀ BMNH, 1♂ ZMHU, 4♂ USNM, 13♂, 1♀ BMB, 1♀ MNHN; env. de Bogotá 3♂, 2♀ BMNH; Cananche Jul. Sep. 16♂, 4♀ BMNH, 5♂ BMB; Guadalite Sep. 1♂ BMNH; Utica Jul. 1♂ BMNH; no specific locality 1♂ BMNH; *Tolima*: Chaparral 800m 1♂ AME; Río Ambeima 1600-1700m Jun. 1♂ AME; Río Chili Apr.-June 3♂, 1♀ BMNH; Tunal 1300-1400m Jun. 1♂ AME; no specific locality 1♂ BMNH; *Valle del Cauca*: Cali 1000m Jun. Oct. 2♂ MUSM; Calima Dam 1300m Jan. Nov. 4♂ AME; Corinto May-Jul. 4♂ BMNH; Lago Calima Oct. 1♂ ESM; Pance 1200m May 1♂, 1♀ LMC; Peñas Blancas Jan. 1♂, 1♀ LMC; Río Aguacatal 2000m 3♂, 1♀ BMNH; Río Anchicayá 1150m Dec. 1♂ AME; Río Bravo, Calima May 1♂ LMC; Río Cali 1500m Jan. 1♂ AME; Río Dagua 4♂ ZMHU; San Antonio 1800m 2♂ BMNH; *Not located*: Cauca 1♂ BMB; Caucathal 1♀ ZMHU; Magdalena Vall. May-Aug. 1♂ BMB; Pipiral 1♂ MNHN; no specific locality 1♂, 3♀ BMNH, 2♂ ZMHU, 1♂ AME, 1♂ USNM, 2♂, 1♀ BMB. "**PERU**" (4♂, 2♀): no specific locality 1♀ BMNH, 1♂ USNM, 3♂ BMB, 1♀ MCZ-error. "**BRAZIL**" (1♀): *Minas Gerais*: Parque Rio Doce Jul. 1♀ AME-error. **COUNTRY UNKNOWN** (5♂, 2♀): no specific locality 5♂ MCZ, 1♀ BMNH, 1♀ BMB.

Additional locality data: **PANAMA**: *Not located*: Peña Blanca (Godman & Salvin, 1884). **COLOMBIA**: *Not located*: Parque de Ucumarí, Alto de Pisones (Andrade, 1994).

Adelpha leucophthalma smalli Willmott, **ssp. nov.**

Figs. **103c,d**; 194c; *310*

Adelpha leucophthalma ssp. nov., Lamas & Small (1992)

Description and diagnosis: FW length of HT: 25mm; dissection vial number KRW-11. The male is distinguished from the nominate subspecies by having a much reduced white postdiscal spot on the DHW, which is typically smaller in cell M_2-M_1 than cell M_3-M_2. The female is unknown.

Types: ***Holotype*** ♂: PANAMA: *Herrera*: Chepo, Distrito Las Minas, Cerro Montuoso 850m 17/3/1979 G.B. Small; in the USNM. ***Paratypes***: PANAMA (13♂): *Herrera*: **1**♂: same data as HT; **1**♂: same data as HT except 1/4/1978; **11**♂: same data as HT except 800m 17/2/1979 (1♂), 22/9/1979 (2♂), 3/3/1979 (5♂), 26/1/1978 (2♂), 27/1/1978 (1♂); all in the USNM.

Etymology: I name this subspecies for Gordon Small, whose collection of Panamanian butterflies, now in the USNM, is probably the most comprehensive private collection ever amassed for a single Neotropical country, and who collected the entire type series.

Taxonomy and variation: There is some variation in the size of the white DHW postdiscal spot, being almost completely absent in some specimens in cell M_2-M_1, but in no specimens does it even approach the size of the spot in the nominate subspecies, which remains almost constant in size throughout the range of that taxon.

Range: This subspecies is known only from the type locality, an isolated mountain range on the Azuero Peninsula of Panama, south of the range of the nominate subspecies.

Habitat and adult ecology: Nothing is known of the biology of this subspecies, but judging from the series in the USNM, it is locally common.

Specimens examined (14♂):
PANAMA (14♂): *Herrera*: Chepo, Distrito Las Minas, Cerro Montuoso 800-850m Jan.-Apr. Sep. 14♂ USNM.

Adelpha leucophthalma irminella Strand, 1918 **stat. nov.**

Figs. **103e,f**; *310*

Adelpha irmina f. *irminella* Strand (1918: 2)

TL: Los Llanos, Ecuador. **Types**: **SMTD**: **HT**♀: "Holotype ♀ Adelpha irmina f. irminella Strand, 1917//Los Llanos (Ecuador) 1400m//irmina ?//Adelpha ♀ irmina Dbl. Strand det et descr." [photograph examined]

=*Adelpha iaere* Hall (1929: 132, pl. III, fig. 3) **syn. nov.**

TL: Balsapamba, Ecuador. **Types**: **BMNH**(T): **HT**♂: "Holotype ♂ Adelpha iaere Hall G. Lamas det. 1987//T.G.H. 1962-546//Ex Oberthür Coll. Brit. Mus. 1927-3//Balzapamba, Prov. de Bolívar, M. de Mathan, III-IV 1894//Holotype//Type"; **PT**♀: Balzapamba; **BMB**: **PT**♂: "Zaruma Ecuador Crowley Coll. 1902//♂//Booth Mus. Coll. 000845" [all examined]

Adelpha irmina Dbld., Raguso & Gloster (1996) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from the remaining two by lacking any white on the DHW. Although Hewitson (1867a) mentions having a specimen in his collection of *A. leucophthalma* from Quito, with a small white spot on the DHW, I have not seen this specimen nor any others from Ecuador with any white on the DHW. Typically there is also no white postdiscal spot on the VHW, but this is occasionally present in some specimens from northwestern Ecuador, in a similar pattern to *A. l. smalli*. The DFW band is also usually slightly paler than in the nominate subspecies.

Strand (1918) described *irminella* from a single female collected in Los Llanos in Ecuador (on the western slopes), stating that it differed from *A. irmina tumida* in having a narrower forewing band and no whitish markings in the discal area of the VHW, and I have examined a photograph of the holotype courtesy of Gerardo Lamas. Strand's (1918) description of the taxon appeared as a short note in an obscure entomological journal, and the name failed even to make the edition of the Zoological Record for that or following years. It is therefore understandable that Hall (1929) was unaware of the name when he described the same taxon again under the name *iaere*. Hall's description is clear and the figure of the dorsal surface and the small type series show this name to be a synonym of *irminella* (**syn. nov.**).

Both Strand (1918) and Hall (1929) regarded this taxon as most closely related to *A. irmina*, Strand treating it as a form and Hall as a distinct species. It is, however, identical to nominate *A. leucophthalma* except for lacking the white postdiscal spot on the hindwing, which is nevertheless present in some specimens on the ventral surface. Since this spot is clearly reduced, almost to absence in some specimens of *A. l. smalli*, this is a character of no more than subspecific value, and I therefore treat *irminella* as a subspecies of *A. leucophthalma* (**stat. nov.**).

Range: This subspecies occurs throughout the western slopes of the Andes in Ecuador, and although it has not been collected in extreme southwestern Colombia, it would certainly be expected there given its presence in localities within sight of the Colombian border. Lamas (1977) reports "*A. leucophthalma*" from Cajamarca, in northwestern Peru, but since there is no indication of specimens examined this appears to be a citation of the erroneous type locality for the nominate subspecies. However, it is just possible that *A. l. irminella* may occur in extreme northwestern Peru.

Habitat and adult ecology: This subspecies occurs commonly in a wide variety of Andean habitats from 500-2700m, from primary cloud forest in the northwest, to dry areas with only remnant patches of secondary forest in central and southern Ecuador. Males are readily attracted to traps baited with rotting fish along forest edges and ridge tops throughout the day. The species flies throughout the year, but is most abundant in the wet season.

Specimens examined (9♂, 2♀):

ECUADOR (9♂, 2♀): *Bolívar*: Balzapamba Mar. Apr. 1♂, 1♀ BMNH; *Cañar*: Manta Real 500m Aug. 1♂ KWJH; *Carchi*: Lita, ridge east of Río Baboso 900m Aug. 1♂ KWJH; *El Oro*: El Placer-Moromoro 800m Feb. 1♀ MUSM; Zaruma 1♂ BMB; *Esmeraldas*: Anchayacu km 15 Lita-San Lorenzo rd. Jul. 1♂ KWJH; *Pichincha*: Río Chisinche 1800m Aug. 1♂ KWJH; Río Tanti 750m Aug. 1♂ KWJH; Tandapi 1500m Jul. Sep. 1♂ USNM, 1♂ KWJH.

Additional locality data: **ECUADOR**: *Carchi*: El Corazón 2700m Sep.; Las Juntas Nov.; Lita, ridge east of Río Baboso Mar. Jul.; Nariz del Diablo Nov.; Santa Rosa Nov.; *Esmeraldas*: El Encanto Jul.; *Imbabura*: Cachaco 1300m Jul.; Río Verde Aug.; Santa Rita de Cachaco 1500m Jul.; *Pichincha*: Mindo Jul. Aug.; Palmito Pamba Jul. Oct.; Reserva El Pahuma Oct.; Reserva Maquipucuna 1300m Aug.; Río Chisinche May; Río Tanti Jun.; San Antonio 1200m Jul.; Tandapi Aug. (Willmott & Hall, sight records).

Adelpha irmina (Doubleday, [1848])

Figs. **104**; 195; 272; *310*

Identification, taxonomy and variation:

This species is superficially similar to a number of others, including *A. saundersii*, *A. leucophthalma*, *A. zina irma*, *A. salmoneus*, *A. boreas* and *A. ethelda zalmona*, but it may be distinguished from the majority by the two large, isolated silvery white subapical spots on the VFW which represent the inner submarginal series (*A. zina irma* also has two pale subapical spots, but these are the postdiscal series, and they lack the immediately basal paler spots present in *A. irmina*), and by the lack of any silvery grey submarginal markings on the VHW distal of the pale yellow postdiscal band in cells 2A-Cu_2 to M_3-M_2. Other useful distinguishing features are the yellow-brown ventral surface ground colour, the reduced silvery grey submarginal markings from the anal margin to cell M_3-M_2, the lack of orange subapical spots on the DFW, and the reduced white postdiscal band on the VHW, which is always present as a large costal spot, then as thin dashes in cells 2A-Cu_2 to Cu_2-Cu_1. Additional characters distinguishing *A. irmina* from *A. leucophthalma* are given under that species. There is variation in the shape, width and colour of the orange DFW band, and the ground colour of the dorsal surface, and two subspecies are recognised.

Adelpha irmina appears to be most closely related to a group of species including *A. cocala*, *A. leucophthalma* and *A. felderi*, as discussed under the first two of those species. While the species is perhaps superficially most similar to *A. leucophthalma*, I have seen two specimens, in the MUSM and USNM, that are possible hybrids between *A. irmina* and *A. cocala*, suggesting a close relationship between these two species. In the MUSM specimen there is whitish coloration at the basal edge of the orange DFW band, representing the postdiscal band, while in the USNM specimen (Fig. 104e,f) the orange DFW band is more vertically orientated, there is very faint whitish postdiscal scaling on the DHW, the VHW has a broad, entire white postdiscal band with an uneven basal edge, the VHW inner submarginal series is complete and the outer submarginal series in cell 2A-Cu_2 on the VFW is visible as two silvery spots. The latter specimen was selected by Forbes, in his unpublished manuscript, to be the holotype of a new species, but it has no characters that are not possessed by either *A. cocala* or *A. irmina*, between which it is clearly phenotypically intermediate. *Adelpha irmina* also shares a number of wing pattern characters with *A. saundersii*, discussed under that species, and although the male genitalia are rather different, the two may still be close relatives.

Range and status: Venezuela, in the Cordillera de la Costa and Mérida and the Sierra de Perijá, to Bolivia along the eastern slopes of the Andes, the Sierra Nevada de Santa Marta and the Guianan plateau in southeastern Venezuela and southern Guyana. Common in a variety of forest habitats in mountainous areas from 450-2300m.

Specimens examined: 227 (187♂, 40♀)

Adelpha irmina irmina (Doubleday, [1848])

Figs. **104a,b**; *310*

Heterochroa irmina Doubleday ([1848]: pl. 36, fig. 2)

TL: [Venezuela]. **Types**: **BMNH**(T): **ST**♀: "Illustrated in The Butterflies of Venezuela A. Neild, 1996//19//Venezuela Hewitson Coll. 79-69 Heterochroa irmina. 4.//B.M. TYPE No. Rh. 9802 Heterochroa irmina ♀ D.W. & H.//irmina D. & H.//Type//Syntype"; **BMNH**(M): **ST**?♂:

"Venezuela Hewitson Coll. 79-69 Heterochroa irmina. 1."; **ST**?♂: "Venezuela Hewitson Coll. 79-69 Heterochroa irmina. 2."; **ST**?♂: "Venezuela//irmina D.D." [all examined]

Adelphia irmina Doubl. Hew. [sic], Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. i. tumida* by the slightly broader orange DFW band, particularly in cell 2A-Cu$_2$, which is typically paler orange, has a straight basal edge that is not indented at vein M$_3$, has the distal edge less produced in cell M$_3$-M$_2$ and has the distal half of the DFW noticeably darker brown than the basal half and the DHW. Variation is slight within the Cordillera de la Costa and the Cordillera de Mérida, except for the southernmost region near the Colombian border, and possibly the eastern slopes, where specimens appear to be slightly transitional to Colombian *A. irmina tumida*. I have also examined a single male in the AME and a single female in the AFEN which both come from the Guianan plateau, and are probably isolated from the main Andean population of this subspecies. These two specimens resemble the three specimens that I have seen from the Sierra Nevada de Santa Marta in having a darker DHW and basal half on the DFW, and the orange on the DFW extends more distally in cell M$_3$-M$_2$. Both of these populations may represent distinct taxa, but I have seen too few specimens to assess the stability of the observed differences in wing pattern. I include them here as the nominate subspecies for the present, although both may prove to be more closely related to the Colombian population of *A. i. tumida* (see discussion under that subspecies).

Doubleday's ([1848]) figure of the dorsal surface of this taxon under the name *Heterochroa irmina* was unaccompanied by text, but Westwood (1850) later gave the locality of the figured specimen as Venezuela. The figure is accurate and closely corresponds to the syntype female in the BMNH (Fig. 104a,b).

Range: Cordillera de la Costa and Cordillera de Mérida in Venezuela. Also recorded in the Sierra Nevada de Santa Marta, the Sierra de Perijá, and, in an apparently isolated population, in the Guianan plateau in southeastern Venezuela and Guyana.

Habitat and adult ecology: This subspecies occurs from 700-2300m, and Neild (1996) reports that it is common, particularly along forest edges. It flies throughout the year.

Specimens examined (43♂, 27♀): † trans. to Colombian *A. i. tumida*.

GUYANA (1♂): *Not located*: Demerara River 1♂† AME. **VENEZUELA** (36♂, 24♀): *Aragua*: Choroní rd., km 19, 1000m Aug. 1♂ AFEN; El Paraíso 700m Jan. 1♂ JFL; Portochuelo 1100m May Oct. Dec. 1♂, 2♀ MUSM; Rancho Grande 1000-1200m Jan. Jul. 1♀ AME, 4♂ USNM; *Bolívar*: Salto el Danto, Canaima Sep. 1♀ AFEN; *Carabobo*: Valencia 1♂ BMNH; *Distrito Federal*: Avila N.P. 1000m Aug. 1♀ AFEN; Caracas 3000' Sep. Oct. Dec. 4♂ AME, 3♂, 5♀ BMB; just S. of Caracas Mar. 1♂ USNM; Mt. Avila Mar. 1♂ USNM; *Mérida*: Barinitas-Apartadero, km 34, Jan. 1♂† MUSM; Mérida 8♂, 4♀ BMNH, 1♀ ZMHU; Montan. Sierra 3000m Jan. 1♀ BMNH; Pedregosa 3000m Apr. 1♂, 1♀ BMNH; *Miranda*: El Encanto Dec. 1♂ AME; *Táchira*: Umaquena 1300m 1♀† MUSM; *Trujillo*: La Laguna, Boconó-Guaramacal Dec. 1750m 1♂† MUSM; *Not located*: no specific locality 4♂, 4♀ BMNH, 1♂, 1♀ ZMHU, 2♂ USNM, 1♂†, 1♀ MCZ. **COLOMBIA** (3♂, 2♀): *El César*: San José 1♂† BMNH; *Magdalena*: Vista Nieva, Santa Marta 1800m Sep. 1♀† BMNH; *Not located*: Maruamaque, Santa Marta 1400m Jul. 1♂†, 1♀† BMNH; no specific locality 1♂ BMB. "**JAMAICA**" (1♂): no specific locality 1♂ MNHN-error. **COUNTRY UNKNOWN** (3♂, 1♀): no specific locality 1♂, 1♀ BMNH, 1♂ ZMHU, 1♂ MNHN.

Adelpha irmina tumida (Butler, 1873)

Figs. **104c-f**; 195a,b; 272a,b; *310*

Heterochroa tumida Butler (1873: 163)

TL: Nauta, Peru. **OTL**: E. Peru; Bogotá [Colombia]. **Types**: **BMNH**(T): **LT**♂: "B.M. TYPE No. Rh. 9800 Heterochroa tumida ♂ Butl.//H. tumida Butl. type//amaz. Nauta//Type//Syntype"; **BMNH**(M): **PLT**♂: "B.M. TYPE No. Rh. 9801 Heterochroa tumida ♂ Butl.//Paratype//New Gren."; **PLT**?♂: "amaz. Nauta" [same label as LT] [all examined]

=*Adelpha irmina wilhelmina* Fruhstorfer (1907: 172)

TL: Marcapata, Peru. **Types**: **BMNH**(M): **ST**♂: "Marcapata//Peru H. Fruhstorfer//Fruhstorfer Coll. B.M. 1937-285" [examined]

Adelpha tumida Butl., Kirby (1877); *Adelpha irmina fumida* [sic] Btlr., Fruhstorfer (1915); *Adelpha irmina* D'Abrera (1987)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account. Colombian specimens tend to have the basal edge of the orange DFW band straighter between the costa and vein Cu$_1$ than typical east Andean specimens, but the DHW and the basal half of the DFW are the same colour as the apical half of the DFW. Phenotypically, these specimens approach those from the Sierra Nevada de Santa Marta and the Guianan plateau, identified tentatively here as the nominate subspecies. Since the differences are slight and the majority of Colombian specimens that I have examined lack precise locality data, it is not clear whether there is a taxon within Colombia distinct from *A. i. tumida*, perhaps occurring north of Bogotá, with *tumida* occurring on the eastern slopes of the Cordillera Oriental. Specimens from southern Peru to Bolivia tend to have narrower orange DFW bands with the distal edge relatively more produced in cell M$_3$-M$_2$.

Butler (1873) described *tumida* as a species distinct from *A. irmina* based on the darker colour and different shape of the orange DFW band, from specimens collected by Degand in eastern Peru and by Stevens in Bogotá. Given the uncertain taxonomic status of Colombian specimens, I designate the Peruvian specimen in the BMNH(T) with the following label data as the lectotype of *Heterochroa irmina*: "B.M. TYPE No. Rh. 9800 Heterochroa tumida ♂ Butl.//H. tumida Butl. type//amaz. Nauta//Type//Syntype" (Fig. 104c,d). The lowland locality, Nauta, is almost certainly incorrect, and the specimen was presumably collected in the east Andean foothills of Peru. A further specimen in the BMNH(M) bears a similar locality label and may be a paralectotype. Fruhstorfer (1907) described *wilhelmina* based on an unspecified number of specimens from Marcapata in Peru, and the characters cited as distinguishing it from the nominate subspecies are precisely those that distinguish *tumida*, of which name Fruhstorfer (1907) appeared to be unaware. I have examined a syntype male in the BMNH(M). Fruhstorfer (1915) placed *tumida* as a subspecies of *A. irmina*, and retained *wilhelmina*, giving its range as Bolivia. This may explain the presence of a putative syntype of *wilhelmina* in the BMNH(T) from "Yungas Bolivia", which also bears a "TYPE" and a "irmina wilhelmina Fruhst." label. Since this specimen is clearly not from the only locality cited in the original description, I do not regard it as a syntype, and it was probably only subsequently labelled as such by Fruhstorfer. Hall (1938) correctly synonymised *wilhelmina* with *tumida*.

Range: Eastern slopes of the Andes, from the Cordillera Oriental in Colombia to Bolivia.

Habitat and adult ecology: This subspecies is common and typically occurs in Andean cloud forest habitats from 1000-1700m, but it has also been recorded in lowland rain forest at 450m at the base of the Andes, and up to 1800m. It is found in a variety of habitats, from primary forest to heavily disturbed secondary forest, usually along rivers but also on ridge tops. I have found males to be attracted to traps baited with rotting fish and occasionally to puddle along rivers, while the much rarer female occurs in large clearings or along wide trails in primary forest.

Specimens examined (144♂, 13♀): † - possible hybrid *A. cocala cocala* x *A. irmina tumida*.

COLOMBIA (23♂, 2♀): "*Boyacá*": Muzo 1♂, 1♀ AME-error; *Caquetá*: Caquetá Jun. 2♂ JFL; *Cundinamarca*: Bogotá 6♂ BMNH, 3♂ USNM; env. de

Bogotá 3♂ BMNH; *Meta*: Guayabetal Aug. Nov. 1♂, 1♀ JFL; U. Río Negro 800m 1♂ USNM; Susumuco Apr. 1♂ BMNH; Villavicencio-Monte Redondo Mar. Apr. 1300m 1♂ BMNH; *Nariño*: San Pablo de Bijagual, Monopamba 1200m Feb. 1♂ MHNUC; *Putumayo*: Mocoa Sep. 1♂ ESM; *Not located*: no specific locality 1♂ BMNH, 1♂ MCZ. **ECUADOR** (22♂, 4♀): *Loja*: env. Loja 1♂ BMB; *Morona-Santiago*: Río Abanico 1600m Nov. 2♀ KWJH, 1♀ DAT; *Napo*: Chichicorrumi 450m Sep. Oct. 1♂ KWJH, 1♂ MJP; *Pastaza*: Alpayacu 3600' 1♂ BMNH; Cururai 1♀ BMNH; Mera Oct. 1♂ AME; Río Bobonaza 1000m Oct. 2♂ MJP; *Tungurahua*: env. de Ambato 1♂ BMNH; La Mascota 1200m Aug. 1♂ AME; Río Blanco 1600m Apr. 2♂ AME; Río Machay 1700m Feb. Jul. 2♂ KWJH; Río Negro Apr. 1♂ DAT; Río Topo Jul. Sep. Oct. 1♂ MJP, 1♂ DAT, 2♂ USNM; Río Verde 5000' 1♂ BMNH; Río Verde Chico Jun. 1♂ DAT; Santa Inéz 1♂ MCZ; *Zamora-Chinchipe*: Zamora 3-4000' 1♂ BMNH. **PERU** (55♂, 2♀): *Amazonas*: Alfonso Ugarte Jul. 1♀ MUSM; Chachapoyas 1♂ BMNH; Falso Paquisha 800m Oct. 1♂ MUSM; *Cuzco*: Buenos Aires, 20-28 km E., 12-1500m Dec. 1♂ MUSM; Callanga 1500m 1♂ ZMHU; Caradoc 4000' Feb. 1♂ BMNH; Marcapata 3♂ BMNH; Quebrada Quitacalzón 1050m May 2♂ MUSM; Santa Isabel, Cosñipata 12-1500m Feb. 2♂ MUSM; Vilcanota 3000m 1♂ BMNH; *Huánuco*: Cushi 1900m 2♂ BMNH; Tingo María Jun. 2♂ FSCA; Tournavista 1♂ AME; no specific locality 1400m Apr. 1♂ USNM; *Junín*: Chanchamayo 1000m Dec. 2♂ BMNH, 1♂ ZMHU, 1♂ AME, 1♂ USNM; La Merced 2500' 1♂ BMNH; San Ramón 3000' Oct. 1♂ BMB; Vitoc 90m May 1♂ MUSM; *Loreto*: Nauta 2♂ BMNH-error?; *Madre de Dios*: Shintuya 1000m Jul. 1♂ AME; *Pasco*: Huancabamba 1♂ BMNH; Oxapampa 2♂ MUSM; Pichis rd. 3000' 1♂ BMNH; Pozuzo 5-6000' 1♂ BMNH, 1♂ BMB; *Puno*: Carabaya 2500-6000' Apr. 1♂ BMNH; Chaquimayo 25-3000' Jun. Jul. 1♂ BMB; La Oroya 3000' Apr. 4♂, 1♀ BMNH; Limbani Mar. 2♂ BMNH; Río Inambari 1♂ BMNH; Río Távara 450m 8/8/95 1♂† MUSM; Sto. Domingo 6000' Apr. Jul. Aug. 3♂ BMNH; *San Martín*: Huayabamba 1♂ ZMHU; Tarapoto-Yurimaguas, km 15, 850m Jan. 1♂ MUSM; *Not located*: Río Huallaga 1♂† USNM; S. Peru 1♂ BMB; no specific locality 1♂ BMB, 1♂ MUSM. **BOLIVIA** (40♂, 5♀): *Cochabamba*: Chaparé 2000m Mar. 1♀ JFL; Cochabamba 5♂ BMNH; El Palmar Jun. Apr. 3♂, 1♀ AME; 5 days N. Cochabamba 2♂ MCZ; San Jacinto 2000m 1♀ ZMHU; *La Paz*: Caranavi 1200m Feb. 3♂ MUSM; Chaco 2-3000m 1♀ ZMHU; Coroico 6500' May 1♂ BMNH, 6♂ BMB; Cusilluni 1♂ MCZ; Farinas 2♂ BMB; La Paz 1♂ BMNH; Río Unduavi 2000m Feb. 2♂ BMNH; San Antonio 3500' Sep. 1♂ BMNH; Yungas 2♂ BMNH; *Santa Cruz*: Bueyes 1♂ BMNH, 1♂ ZMHU; Río Juntas 3000' 1♂ BMNH, 1♀ ZMHU; *Not located*: Alezuni 1♂ BMB; no specific locality 5♂ BMNH, 1♂ BMB, 1♂ MCZ. **COUNTRY UNKNOWN** (2♂): no specific locality 1♂ AME, 1♂ BMB.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Abanico Dec.; Río Miriumi Oct.; *Napo*: Tena-Loreto rd., km 49, Mar. Oct.; *Pastaza*: Río Llandia Aug.; *Sucumbíos*: La Bonita-Rosa Florida rd., km 15, Mar.; Río Sucio Nov.; *Tungurahua*: Chinchin Nov.; Río Machay 1800m Apr. Aug.; Río Zuñac Jul.; *Zamora-Chinchipe*: Quebrada Chorillos Apr. Nov.; Zumba-Loja rd., km 35, Jul. (Willmott & Hall, sight records).

Adelpha saundersii (Hewitson, 1867)

Figs. **105**; 196; 273; *311*

Identification, taxonomy and variation:

This species is distinguished from almost all other similar species by the heavy yellowish shading on the VHW and the silvery ground colour of the pale markings in the basal half of the VHW and the VFW discal cell. A unique character is the reddish line in cell Rs-Sc+R$_1$ on the VHW, which is the continuation of the first discal cell bar, extending right to the base of the cell, so that there is no silver/white marking at the base of the cell. *Adelpha lamasi* can be additionally distinguished by the much narrower orange DFW band, with the basal edge of the upper postdiscal series notably displaced distally of the postcellular bar on the VFW, by having less yellowish shading in the basal areas of cells 2A-Cu$_2$ and Cu$_2$-Cu$_1$ on the VHW, by the inner submarginal series consisting of silver-grey spots in cells Cu$_2$-M$_2$, and by the yellowish postdiscal markings in cell Cu$_2$-Cu$_1$ on the VFW not being split by a dark red-brown line. There is some variation in the colouring of the postdiscal series on the ventral surface and the width of the orange DFW band, and three subspecies are recognised.

Adelpha saundersii is probably the sister species of *A. lamasi*, with which it shares the following characters: the orange DFW subapical spots appear to be composed of only the inner postdiscal series, represented on the VFW by the silvery/white spots in cells M$_2$-M$_1$ and M$_1$-R$_5$, while the outer postdiscal series, represented on the VFW by yellowish scaling in cells M$_2$-M$_1$ and M$_1$-R$_5$ aligned with the distal edge of the postdiscal band in cell M$_3$-M$_2$, do not appear on the DFW. Virtually all other *Adelpha* have the orange DFW subapical spots composed of the fused postdiscal series. The inner submarginal series on the VFW is absent except in cell 2A-Cu$_2$ and cells M$_2$-M$_1$ to the apex, while the outer submarginal series is absent. On the VHW, the postdiscal band and the inner postdiscal series are almost overlapping, the sinuous shape of the latter being the same in both species, the outer submarginal series is composed of yellowish spots that increase in width from the costa to the tornus, and the ground colour of the anal margin posterior of vein 2A is entirely yellow. The hindwing apex is also sharply angled basally at vein Rs, and the valvae of the male genitalia are similar in shape and lack spines at the posterior tip. *Adelpha saundersii* also shares a number of wing pattern characters with *A. irmina*, including the very similarly shaped orange DFW band, the red-brown scaling which usually separates the postdiscal series and postdiscal band on the VFW, the loss of the VFW silver submarginal series in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ and pronounced spots in cells M$_3$-M$_2$ to the apex, and the outer submarginal series on the VHW being absent and the inner being pronounced in cells M$_2$-M$_1$ to the costa, being replaced throughout the rest of the wing by yellowish brown scaling. The male genitalia of the two species however are rather different, with the valvae of *A. saundersii* lacking spines at the posterior tip and being narrower and more elongated. Nevertheless, I suspect that *A. irmina* and *A. saundersii* are closely related.

Range and status: Colombia to northwestern Ecuador on the west Andean slopes, to Bolivia on the eastern slopes. Not uncommon in primary cloud forest habitats from 700-2300m, though rarely occurring below 1000m.

Specimens examined: 172 (165♂, 7♀)

Adelpha saundersii saundersii (Hewitson, 1867)

Figs. **105a,b**; 196a,b; 273a,b; *311*

Heterochroa saundersii Hewitson (1867b: 564)

TL: Ecuador. **Types**: **BMNH**(T): **ST**♀: "Saundersii//B.M. TYPE No. Rh. 9893 Heterochroa saundersii ♀ Hew.//Ecuador Hewitson Coll. 79-69 Heterochroa saundersii. 4.//Type//Syntype" [examined]

=*Adelpha saundersii leutha* Fruhstorfer (1915: 513)

TL: Cushi, Peru. **Types**: **BMNH**(R): **HT**♂: "Syntype//TYPE//Cushi, Huánuco, 1820m, 1904 (W. Hoffmanns)//saundersii forma leutha Fruhst." [examined]

Adelpha saundersii Hew., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. s. frontina* by always lacking orange DFW subapical spots and by the narrower orange postdiscal band in cells Cu$_1$-M$_3$ and M$_2$-R$_5$ on the DFW. On the VHW, the red-brown marking distal of the silver submarginal marking in cell M$_3$-M$_2$ is thicker (in *A. s. frontina* this red-brown marking is of equal width to similar markings in other cells) and the silvery areas have a yellowish cast, while the postdiscal series on the VFW consists of two silver spots in cells M$_2$-M$_1$ and M$_1$-R$_5$, with yellowish shading distally, instead of having the yellowish shading cover the postdiscal spots. *Adelpha s. helepecki* has the heavy yellowish shading over the silver outer postdiscal and inner submarginal series on the VHW continuing to the costa, rather than just to cell M$_3$-M$_2$. There is slight variation in the width of the orange DFW band.

Hewitson's (1867b) description of *saundersii*, based on an unspecified number of female specimens in his collection from Ecuador, is accurate and clearly refers to this species. The syntype female in the BMNH confirms that the name represents this taxon. Fruhstorfer (1915) described *leutha* from a single specimen from Cushi, collected at 1820m, in the Tring Museum, now in the BMNH(R). The distinguishing characters cited, namely the smaller size and paler ventral surface, represent no more than individual variation and the name was synonymised with *saundersii* by Hall (1938).

Range: East Andean slopes from Colombia to southern Peru, where it appears to overlap in range with *A. s. helepecki*. There are also two records from the eastern slope of the Colombian Cordillera Central (Tolima). The species probably also occurs in Venezuela in the Cordillera de Mérida, but has yet to be recorded.

Habitat and adult ecology: This species occurs in relatively intact cloud forest habitats from at least 1200-2200m, though it probably also occurs higher. In my experience in Ecuador, it fluctuates in abundance from one month to the next, but appears to fly throughout the year and is typically not uncommon. Males are usually found along steep, forested rivers, but also fly within the forest in mid-altitude habitats. Males may be found puddling at damp sand, particularly at urine, and are readily attracted to traps baited with rotting fish along rivers. The female is much scarcer than the male, and I have never observed it in the field.

Specimens examined (97♂, 4♀): † - trans. to *A. s. helepecki*.
COLOMBIA (10♂, 1♀): "*Boyacá*": Muzo 2♂ AME-error?; *Caquetá*: Caquetá Jun. Sep. Nov. 2♂, 1♀ JFL; *Cundinamarca*: Bogotá 1♂ BMNH, 1♂ USNM; *Tolima*: Río Ambeima 1600-1700m Jun. 1♂ AME; Río San Fernando 2000m Jun. 1♂ AME; *Not located*: no specific locality 1♂ BMNH, 1♂ BMB. **ECUADOR** (14♂, 2♀): *Loja*: env. Loja 2♂ USNM; San Francisco Aug. 1♂ BMB; *Napo*: Río Chonta, nr. Cosanga 2000m Oct. 2♂ KWJH; Río Hollín Sep. 1♀ DAT; *Tungurahua*: Río Blanco Jul. 1♂ AME; Río Machay 1700m Aug. 4♂ KWJH; Topo Mar. 1♂ DAT, Dec. 1♂ AME; *Zamora-Chinchipe*: Quebrada Chorillos Nov. 2♂ DAT; *Not located*: no specific locality 1♀ BMNH. **PERU** (73♂, 1♀): *Amazonas*: Chachapoyas 4♂, 1♀ BMNH; Nueva Esperanza, 3 km N., 1700m Mar. 1♂ MUSM; *Cajamarca*: Charape Jun. 1♂ BMNH; *Cuzco*: Callanga 1♂ ZMHU; Marcapata 4500' 1♂ BMNH; Río Pampaconas Aug. 2♂ USNM; *Huánuco*: Cord. del Sira 1380m Aug. Sep. 2♂ MUSM; Cushi 1820m 8♂ BMNH; Pillao 3500m Mar. 1♂ AME; *Junín*: Chanchamayo Jan.-Aug. 8♂ BMNH, 1♂ ZMHU, 1♂ BMB; Hda. Naranjal, 7 km E. Mina Pichita 1550-1650m Nov. 1♂ MUSM; La Merced Aug. Sep. 3♂ BMNH; Puente Yanango 2000m Oct. 1♂ MUSM; Río Colorado 2500' Sep. 1♂ BMNH; San Ramón 3000' Oct. 1♂ BMNH, 2♂ BMB; *Pasco*: Chuchurras 1♂ MUSM; Huancabamba 5000' Aug. 5♂ BMNH, 3♂ BMB; Oxapampa 2100m May 2♂ MUSM; Pichis Rd. 3000' 1♂ BMB; *Puno*: La Oroya 3000-3500' Mar. Apr. Nov. 4♂ BMNH; Limbani 10000' Sep. 1♂ BMNH; Sto. Domingo 4500-6000' Jul. Aug. 5♂(3†) BMNH; *San Martín*: Las Palmas, P.N. Abiseo 21-2680m Aug. 1♂ MUSM; Moyobamba 2♂ BMB; Puca Tamba 5150' 1♂ BMNH; Quebrada El Peligro, P.N. Abiseo 2045♂ Aug. 3♂ MUSM; Mashoyacu, Río Huambo Feb. 1♂ MUSM; *Not located*: S. Peru 1♂ BMB; no specific locality 1♂ BMNH, 1♂ USNM.
Additional locality data: **ECUADOR**: *Napo*: El Arrayán 2200m Nov.; Tena-Loreto rd., km 49, 1350m Mar. Aug.; Vinillos 2000m Oct.; *Sucumbíos*: La Bonita-Rosa Florida rd., km 15, Mar.; Río Palmar 1200m Nov.; Río Sucio Nov.; *Tungurahua*: Chinchin Nov.; Río Cholo Hay Sep.; Río Machay Feb. Apr.; *Zamora-Chinchipe*: Quebrada Chorillos 1250m Apr.; Quebrada Las Dantas Oct.; Quebrada San Ramón 1700m Oct. (Willmott & Hall, sight records).

Adelpha saundersii helepecki Weeks, 1901 **stat. rest.**

Figs. **105c,d**; *311*

Adelpha helepecki Weeks (1901: 354)

TL: "Bolivia, near Alezuni". **Types**: **MCZ**: **ST**?♂: "Coroico, Bolivia. May, 1899 Coll. A. G. Weeks, Jr.//Type//A G Weeks collection//M.C.Z. Type 30097//This specimen photographed for G. Lamas by A. Aiello Jan. 1981" [examined]

Adelpha saundersii helepecki Weeks, Fruhstorfer (1915); =*Adelpha saundersii saundersii* Hew., Hall (1938)

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account, and from *A. s. frontina* by similar characters. Certain specimens have slight reddish brown scaling on the VFW in the yellowish postdiscal markings in cells Cu_2-Cu_1, Cu_1-M_3 and M_3-M_2, representing the ground colour between the fused postdiscal series.

Weeks (1901) described this taxon as a distinct species, based on 10 specimens from near Alezuni in Bolivia. The specimen identified as a syntype in the MCZ is from Coroico, but corresponds very closely with the original description and Weeks' (1911) subsequent figure of the taxon. I have seen no specimens in any collections labelled "Alezuni", and cannot say for certain whether or not the MCZ specimen is a valid syntype. Nevertheless, the description is sufficiently detailed for there to be no doubt as to the taxon described. Weeks (1901) stated that he also had specimens of typical *A. saundersii* from Bolivia, which differed from *helepecki* in having white instead of silvery markings on the ventral surface, and the "bright tawny on the underside...replaced by dark brownish". It is unclear to me exactly what specimens Week had identified as Bolivian *saundersii*, since all of the specimens I have seen from that country have been typical *helepecki*. Fruhstorfer (1915) treated the taxon as a subspecies of *A. saundersii*, but Hall (1938) synonymised the two names. Although there appears to be a small area of overlap between the two taxa in southern Peru, accompanied by specimens transitional in wing pattern, both are phenotypically stable over the remainder of their ranges and I reinstate *helepecki* as a subspecies of *saundersii* (**stat. rest.**).

Range: Extreme southern Peru to Bolivia.

Habitat and adult ecology: *Adelpha s. helepecki* is not uncommon in the field, and has been recorded from 700-2300m. I have collected males puddling along river banks in remnant secondary forest in Bolivia.

Specimens examined (51♂, 2♀):
PERU (5♂, 2♀): *Cuzco*: Buenos Aires 2-2300m Dec. 1♀ MUSM; Buenos Aires, 20-28 km E., 12-1500m Dec. 1♂ MUSM; Quebrada Morro Leguia, Cosñipata 2150m May 1♂, 1♀ MUSM; no specific locality 1♂ MCZ; *Puno*: S. Domingo, Carabaya 6500' Nov. 1♂ BMNH; Uruhuasi, N. of Ollachea Apr. May 1♂ BMB. **BOLIVIA** (45♂): *Cochabamba*: El Palmar Jan. Apr. Dec. 3♂ AME; 5 days N. Cochabamba 6♂ MCZ; Locotal 1♂ ZMHU; San Jacinto 6-8000' 2♂ BMNH, 1♂ ZMHU; Yungas del Esp. Santo 5♂ BMNH; *La Paz*: Caranavi 700-1200m Feb. Sep. 1♂ KWJH, 1♂ MUSM; Chaco 2-3000m 1♂ ZMHU; Chairo 1♂ BMNH; Coroico 6500' May 2♂ BMNH, 1♂ ZMHU, 1♂ MCZ; Cusilluni May 1♂ MCZ; Farinas 1♂ BMB; La Paz 1♂ BMNH; Río Songo 1200m 1♂ ZMHU; Río Suapi 1000m 1♂ ZMHU; Unduavi 1♂ BMNH; *Santa Cruz*: Río Juntas 3000' 2♂ BMNH; *Not located*: no specific locality 8♂ BMNH, 1♂ AME, 1♂ BMB, 1♂ MCZ. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Adelpha saundersii frontina Hall, 1935

Figs. **105e,f**; *311*

Adelpha saundersii frontina Hall (1935: 223)

TL: Frontino, W. Colombia. **Types**: **BMNH**(T): **ST**♂: "Syntype ♂ Adelpha saundersii frontina Hall G. Lamas det. 1987//Adelpha saundersi, Hew. Godman-Salvin Coll. 1916.-4.//♂//Frontino Antioquia T.K. Salmon// Type//Syntype"; **BMNH**(M): 4**ST**♂: "Adelpha saundersi, Hew. Godman-Salvin Coll. 1916.-4.//♂//Frontino Antioquia T.K. Salmon" [all examined]

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account. The orange subapical spots on the DFW are variable and may be absent.

Hall (1935) described this taxon, mentioning all of the principal distinguishing characters, from 5 males in the BMNH from Frontino, and I have examined the entire type series (Fig. 105e,f).

Range: This subspecies occurs throughout the both slopes of the Cordillera Occidental in Colombia to extreme northwestern Ecuador. Although records from elsewhere in Colombia are lacking, it may occur as far east as the western slope of the Cordillera Oriental.

Habitat and adult ecology: *Adelpha s. frontina* is known from 1000-2100m in primary cloud forest habitats, where it is locally not uncommon. I have found males in western Ecuador in the Reserva Golondrinas, where they were attracted to traps baited with rotting fish both along the river and within the forest. The species has not been recorded further south in Ecuador, suggesting that either the habitat is too degraded, or, more likely, that it is most common in cloud forest areas with higher precipitation.

Specimens examined (17♂, 1♀): † - trans. to *A. s. saundersii*.
COLOMBIA (12♂, 1♀): *Antioquia*: Frontino 5♂ BMNH; *Cundinamarca*: Bogotá 1♂† BMB; *Nariño*: La Planada 1700-1800m May Jul. Aug. 1♂, 1♀ ESM, 1♂ MHNUC; *Valle del Cauca*: Cali 1000m Jul. Nov. 2♂ MUSM; Quebrada Las Ollas 1150m Oct. 1♂ MHNUC; San Antonio km 14 2100m Jan. 1♂ LMC. **ECUADOR** (5♂): *Carchi*: Nariz del Diablo, Río Golondrinas 1900m Nov. 1♂ KWJH; Santa Rosa, Río Golondrinas 1700m Sep. Nov. 4♂ KWJH.

Adelpha lamasi Willmott & Hall, 1999

Figs. **106a,b**; 197a,b; 274a,b; *311*

Adelpha lamasi Willmott & Hall (1999: 4, fig. 3a-d, 14a-d)
TL: ridge to east of Río Baboso, nr. Lita, Carchi, W. Ecuador. **Types**: **KWJH**: **HT**♂: ridge to east of Río Baboso, 1000m, 26 Aug. 1996, *leg.* K. R. Willmott; **AT**♀: Anchayacu, km 15 Lita-Alto Tambo rd., Ecuador, 1 Jul. 1998; **PT**♂: same data as HT; **PT**♂: same data as AT; **PT**♀: El Encanto, km 16 Lita-Alto Tambo rd., Ecuador, 1 Dec. 1996; **PT**♀: km 16 Lita-Alto Tambo rd., Ecuador, 19 Jun. 1994; **JFL**: **PT**♂: San José del Palmar, Colombia, 20 Jan. 1991, *leg.* J. Salazar; **PT**♂: Queremal, km 55, Colombia, 10 Apr. 1990, *leg.* J. Salazar; **MUSM**: **PT**♂: Cali, Colombia, 18 Jul. 1976, *leg.* I. Denhez; **LMC**: **PT**♂: El Queremal, Colombia, 22 Jul. 1982, *leg.* L. Constantino [all examined]

Identification, taxonomy and variation:

Adelpha lamasi is perhaps most similar to *A. saundersii*, and is distinguished under that species. Distinctive characters of the species include the narrow, almost vertical orange DFW band, the four bright silver-white subapical spots on the VFW in cells M_2-M_1 and M_1-R_5, the entirely fused postdiscal series and postdiscal band on the VFW except in cell M_3-M_2, the lack of any silver-grey submarginal markings on the VFW distal of the postdiscal band in cells Cu_2-M_2, and the fading and merging of the postdiscal and submarginal series on the VHW. These characters distinguish the species from other similar taxa such as *A. levona*, *A. rothschildi* and *A. salus*, while *A. irmina* differs in having a more diagonal forewing postdiscal band, a darker reddish brown ventral hindwing ground colour and only two rather than four prominent silvery white subapical spots on the ventral forewing. In addition, the male genitalia of *A. irmina* differ from *A. lamasi* in having spines at the distal tip of the valvae. There is some individual variation in the width of the orange forewing band and the extent to which it is constricted at vein M_3, in addition to the size of the dorsal forewing subapical spots.

This species was described from a type series of seven males and three females, all of which I have examined (Fig. 106a,b). The ventral wing pattern and genitalia suggest *A. lamasi* is the sister species of *A. saundersii*, as discussed under that species.

Range: Western slopes of the Cordillera Occidental in Colombia to northwestern Ecuador. A single specimen labelled “Cali” indicates that it may also occur in the Cauca valley, although I regard its presence there as requiring confirmation.

Habitat and adult ecology: *Adelpha lamasi* is currently known from very wet premontane rainforest habitats in a narrow altitudinal band from 850-1200m. All the males that I have seen in nature have been attracted to traps baited with rotting fish placed 5-7 m above the ground in light gaps along ridge tops in slightly disturbed primary forest, during periods of bright sun in the late morning. Females may be found in large light gaps in primary forest or along trails through old selectively logged forest, where there is an abundance of secondary growth, from midday to 1pm. The species can be not uncommon and its rarity in collections probably reflects its limited geographic range and very local nature within sites. It also appears to fluctuate temporally in abundance; despite a number of visits to the type locality I have only encountered it there on one occasion, at the end of the wet season, when the majority of other specimens have been captured. At that time several individuals were seen, all at a single section of the path. *Adelpha lamasi* occurs sympatrically with several species with a similar dorsal surface wing pattern, such as *A. rothschildi*, *A. levona*, and (presumably) *A. salus emmeli*. All are restricted to similar altitudinal and geographic ranges, and are probably involved in mimicry.

Specimens examined: 12 (9♂, 3♀)
COLOMBIA (4♂): *Chocó*: San José del Palmar Jan. 1♂ JFL; *Valle del Cauca*: Cali 1000m Jul. 1♂ MUSM; Queremal, km 55 1200m Apr. 1♂ JFL; El Queremal Jul. 1♂ LMC. **ECUADOR** (3♂, 3♀): *Carchi*: Lita, ridge east of Río Baboso 1000m Aug. 2♂ KWJH; *Esmeraldas*: Anchayacu, km 15 Lita-Alto Tambo rd. 1000m Jul. 1♂, 1♀ KWJH; El Encanto, km 16 Lita-Alto Tambo rd. 850m Jun. Jul. Dec. 2♂, 2♀ KWJH.

Adelpha salus Hall, 1935

Figs. **107**; 198; 275; *312*

Identification, taxonomy and variation:

Adelpha salus is superficially similar to a number of other species, but may be distinguished from all by the reduction of the inner postdiscal series throughout the VHW, except in cells M_1-Rs and Rs-Sc+R_1, where it is present as two silvery grey blocks merging with the anterior end of the outer postdiscal series, which is entirely replaced by a continuous orange-brown line. Other distinctive features are the separation of the postdiscal series and postdiscal band in cells Cu_1-M_3 and M_3-M_2 on the VFW by a solid red-brown line, which also borders the postdiscal band in cell Cu_2-Cu_1, and the presence of the inner submarginal series in cell 2A-Cu_2 on the VFW as paired silver-grey spots. There is variation in the inclination and shape of the orange DFW postdiscal band, and three subspecies are recognised, one of which is undescribed.

This is a very rare and poorly known species, which was unknown to Fruhstorfer (1915), subsequently figured by Hall (1935) in his original description, but omitted by D’Abrera (1987) due to the absence of specimens in the BMNH. Two of the three taxa have only recently been recognised. The absence of sclerotised bands on the corpus bursae of the female genitalia place the species in the *A. cocala* group, while the male genitalia, with spines on the posterior tip of the valvae, and the ventral wing pattern, suggest that the species may be closely related to *A. shuara*. *Adelpha salus* and *A. shuara* share the following wing pattern characters: the first cell bar in the VFW discal cell is curved and strongly inclined, the postdiscal series are fused throughout, separated from the postdiscal band in cells Cu_1-M_3 and M_3-M_2 by a solid red-brown line, and absent (see following comment) in cells 2A-Cu_2 and Cu_2-Cu_1, there is a reddish brown vertical dash in cell Cu_2-Cu_1 distal of the VFW postdiscal band (possibly representing the postdiscal series; this is isolated in *A. s. emmeli*, and lining the distal edge of the band in remaining *A. salus*), the outer submarginal series on both wings are almost entirely absent, the base of the VHW basal of the humeral vein is entirely red-brown, and the outer postdiscal series on the VHW is entirely replaced by an orange-brown line. It will be interesting to see if the behaviour of perching males of this species, unreported to date, matches that of *A. shuara* and *A. argentea*.

Range and status: Mexico to western Ecuador. Very rare in premontane forest from 400-2000m, two of the three subspecies undescribed before 1999.

Specimens examined: 18 (9♂, 9♀)

Adelpha salus salus Hall, 1935

Figs. **107a,b**; 198c; *312*

Adelpha salus Hall (1935: 222, pl. VI, fig. 1)

TL: "Villavicencio, Colombia"erroneous. **Types**: **BMB**: **HT**♀: "A. salus TYPE Entomologist 1935 p. 222//718000//Type//Valdevia, Colombia//♀" [examined]

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. salus* ssp. nov. under that taxon, and from *A. s. emmeli* in having the basal edge of the orange DFW band diagonal, instead of vertical, and the upper postdiscal band on the DFW much broader. The few specimens examined show little variation.

Hall (1938) described this species from a single female specimen in his collection which he stated was from Villavicencio, but this appears to have been in error since the species is only known west of the Andes and the holotype, which is clearly the specimen figured, bears the locality Valdevia (Fig. 107a,b).

Range: This subspecies is known only from several sites at the northern tips of the Cordilleras Occidental and Central in Colombia, but it is probably more widespread throughout Colombia west of the Cordillera Oriental.

Habitat and adult ecology: This very rare subspecies has been recorded from 800-2000m and nothing is known of its behaviour. If, as I suspect, the species is closely related to *A. shuara* and *A. argentea*, then it should be looked for perching along rivers in clearings in primary forest.

Specimens examined (5♂, 3♀):

"**PANAMA**" (1♂): *Chiriquí*: Chiriquí 1♂ MCZ-error. **COLOMBIA** (4♂, 2♀): *Antioquia*: Valdivia 1♀ BMB; *Caldas*: Pensilvania 1500m Jun. 2♂ JFL; *Chocó*: Quebrada San Antonio 800m May 2♂ JFL; *Risaralda*: Cerro Tatamá 2000m Jun. 1♀ JFL. **COUNTRY UNKNOWN** (1♀): no specific locality 1♀ MCZ.

Adelpha salus emmeli Willmott & Hall, 1999

Figs. **107c,d**; 275; *312*

Adelpha salus emmeli Willmott & Hall (1999: 6, fig. 4a,b)

TL: km 85 old Santo Domingo rd., Pichincha, W. Ecuador. **Types**: **FSCA**: **HT**♀: km 85 old Santo Domingo rd. [examined]

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate under that account.

Willmott & Hall (1999) described this subspecies from a single female in the FSCA (Fig. 107c,d). Although the dorsal surface differs significantly from the nominate subspecies, the ventral hindwing pattern, especially the fusion of the inner and outer postdiscal series at the costa and their configuration over the remainder of the wing, is diagnostic of this species.

Range: The subspecies is known only from the single female specimen, from Pichincha Province in western Ecuador. It is no doubt more widespread in western Ecuador, probably also extending into southwestern Colombia.

Habitat and adult ecology: Nothing is known of the behaviour of this very rare taxon. The type locality lies at around 1200m on the west slopes of the Ecuadorian Andes, in premontane rainforest. Raguso & Gloster (1996) report a species as "*A. rothschildi*" from Reserva Maquipucuna, in Pichincha Province, but it is possible that this record refers to *A. salus*. I summarise their observations under *A. rothschildi*. The close resemblance of the dorsal surface of *A. salus emmeli* to other, relatively unrelated, species of *Adelpha*, which are endemic to a similar elevational range in the western Andes, such as *A. levona*, *A. rothschildi* and *A. lamasi*, suggests some mimetic relationship between these taxa.

Specimens examined (1♀):

ECUADOR (1♀): *Pichincha*: "Old Sto. Dom. Rd. km 85 Ecuador 1 Jul. 80 T.C. Emmel" 1♀ FSCA.

Adelpha salus **ssp. nov.**

Figs. **107e-h**; 198a,b; *312*

Adelpha sp. near *boreas* Fruhst. [sic], Hall & Willmott (1993); *Adelpha boreas opheltes* Fruhst., de la Maza & de la Maza (1993) misid.

Identification, taxonomy and variation:

This subspecies is distinguished from the nominate by having the orange subapical spots on the DFW in cells M_1-R_5 to R_5-R_4 absent or represented by only a few scales, the basal and distal edges of the orange DFW band more diagonally orientated, and the distal edge of the orange DFW band slightly produced in cell M_3-M_2. The forewing distal margin is slightly concave instead of being straight or convex, and the space between the inner submarginal series and the postdiscal band in cell 2A-Cu_2 on the VFW is filled with red-brown scaling, whereas in the nominate subspecies the silver-grey dashes of the inner submarginal series are bordered immediately basally by dark greyish brown scaling. There is slight, probably clinal variation in the thickness of the orange DFW band from Mexico, where it is narrowest, to Panama, while Mexican specimens are also rather darker on the ventral surface with a narrower silver-grey postdiscal band on the hindwing.

A female specimen of this taxon was figured by Hall & Willmott (1993), who discussed the differences between it and other similar sympatric species. It was probably also this taxon which was listed as *A. boreas opheltes* by de la Maza & de la Maza (1993), since that taxon is not known to occur west of Costa Rica. I do not describe it here since Lee and Jacqueline Miller (AME) have been working on describing it for some time and will do so in the near future.

Range: Central Mexico to western Panama.

Habitat and adult ecology: This subspecies is rare in collections, with the majority of specimens having been collected in Mexico, where it appears to be fairly widespread if the range reported for *A. boreas opheltes* by de la Maza & de la Maza (1993) actually applies to this species. It has been recorded from 400-1700m in premontane rain forest to cloud forest habitats. The single specimen that I have seen of the subspecies was flying in the late morning along the edge of a field, with nearby remnant patches of premontane forest, in Costa Rica above the village of La Suiza, when it was captured by Jason Hall. The species is otherwise very rare in Costa Rica, where it was unreported by DeVries (1987), although I have seen a single female specimen in the USNM collected by Schaus. Annette Aiello (pers. comm.) also reports that there are two specimens in her collection (at STRI) collected by Gordon Small on the Río Sarapiquí in June, and another from Alajuela Province.

Specimens examined (4♂, 5♀):

MEXICO (4♂, 2♀): *Chiapas*: San Felipe, 3000', Sta. #3, 20 Jan 1974 R. Wind 1♂ AME; Las Delicias, June 1969 T. Escalante 1♀ AME; Santa Rosa Comitán, July 1966 T. Escalante 1♀ AME; *Oaxaca*: "Mexico, Oaxaca, Sierra de Juárez, La Esperanza 1700m 28.VII.80" 1♂ MUSM; *Puebla*: "Mexico, Puebla, Barranca de Patla, 400m 23.VIII.82" 1♂ MUSM; *Veracruz*: "Mexico: Misantla VI-10 2493 R. Müller//MCZ has this as boreas F." 1♂ USNM. **COSTA RICA** (2♀): *Cartago*: "C. Rica: Cachí Collection Wm. Schaus" 1♀ USNM; La Suiza, nr. Turrialba 800m 1♀ KWJH. **PANAMA** (1♀): *Chiriquí*: Chiriquí [Potrerillos area] Jan. 28 1♀ FSCA.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva; Cuenca de Tulijá; Macizo Central; Selva Lacandona (de la Maza & de la Maza, 1993: as *A. boreas opheltes*).

Adelpha shuara Willmott & Hall, 1995

Figs. **108a,b**; 199a-d; 276a,b; *313*

Adelpha shuara Willmott & Hall (1995: 106, fig. 1a,b, 3)

TL: San José, Río Llandia, Puyo-Tena rd., km 25, Ecuador. **Types** (all Ecuador): **KWJH**: **HT**♂: San José, 950m, 26 Aug. 1993; **PT**♂: same data as HT; **PT**♂: Pimpilala, Río Jatunyacu, 600m, 17 Apr. 1995; **USNM**: **PT**♂: Río Topo, 1300m 7 Jul. 1993; **AME**: **PT**♂: Topo Aug.; **PT**♂: La Mascota, 1200m Aug.; **PT**♂: Río Tigre, 1200m Aug. [all examined]

Identification, taxonomy and variation:

This species is superficially similar to *A. attica*, but is easily distinguished from that species, and all other similar species, by the solid red-brown line running along the distal edge of the VFW postdiscal band, isolating the two pale yellow spots of the postdiscal series in cells Cu_1-M_3 and M_3-M_2. The VFW postdiscal series are absent in cells 2A-Cu_2 and Cu_2-Cu_1, there instead being a vertical red-brown dash in cell Cu_2-Cu_1, the VHW discal cell bars are almost fused, enclosing a red-brown band running from the costa to the anal margin, and the outer postdiscal series on the VHW is entirely replaced by an orange-brown line. There is slight variation in the extent to which the orange spots of the postdiscal series are fused to the postdiscal band on the DFW in cells Cu_1-M_3 and M_3-M_2, the spots sometimes being completely merged with the band, sometimes with the distal half of the spot distinct. The male genitalia are quite variable, particularly in the shape of the clunicula, which may be short and rounded or more pointed, and in the shape of the valvae, which may or may not have a pronounced ventral medial lobe.

Willmott & Hall (1995) described this species from a series of seven males, and compared it to *A. argentea*. *Adelpha shuara* may also be closely related to *A. salus*, as discussed under that species, but it appears to be the sister species of *A. argentea*, or *A. argentea* and *A. coryneta*. *Adelpha shuara* shares the following characters with *A. argentea*: the upper postdiscal band on the DFW is reduced; on the VFW, the postdiscal band is bordered distally by a vertical, solid red-brown line in cells 2A-Cu_2, the postdiscal series are entirely fused, and also absent in cells 2A-Cu_2 and Cu_2-Cu_1, there is a postdiscal red-brown dash in cell Cu_2-Cu_1, the inner submarginal series is pronounced in all cells except for Cu_1-M_3 and M_3-M_2, in which it is absent; on both VFW and VHW, the outer submarginal series is entirely replaced by orange-brown except in cells 2A-Cu_2 and Cu_2-Cu_1, where it is clearly expressed; and the outer postdiscal series on the VHW is entirely replaced by an orange-brown line, the inner postdiscal series being absent but replaced in cells 2A-Cu_2 to M_3-M_2 by an orange-brown line which borders the distal edge of the white postdiscal band. The male genitalia also have a similar valva shape, which is short and broad, but the clunicula of *A. shuara* is noticeably shorter, not projecting above the dorsal edge of the valve. The behaviour of adult males of this species is also distinctive and similar to that of *A. argentea*.

Range: East Andean foothills in extreme southeastern Colombia to central Ecuador south of the town of Macas. The species' range probably also extends into Peru.

Habitat and adult ecology: This highly distinctive, recently described species is local but at a particular site may be common. It occurs in premontane rain forest habitats from as low as 550m at the base of the Andes to 1300m, but is most frequently encountered from 1000-1300m. Males are almost always found perching on bushes around 2-4m above the ground, in cleared areas near forest along streams and rivers, while the only female I have seen in nature was also flying in secondary growth beside a river. The species may colonise such clearings opportunistically; along the Río Pindo Grande near the village of Shell, the species was absent during several early visits but later became common when a large clearing was made along a stretch of river bank, in which males began to perch in numbers. It seems distinctly possible that habitat disturbance in recent years may have increased the number of sites where this species might be found, perhaps explaining why early collectors, such as Buckley, failed to capture the species, while a number of recent lepidopterists have recorded it. Unlike the majority of *Adelpha*, I have never found this species to be attracted to baits such as rotting fish, which might perhaps explain its rarity in collections, in addition to its limited altitudinal and geographic range.

Specimens examined: 29 (26♂, 3♀)

COLOMBIA (1♂): *Cauca*: Río Villalobos Sep. 1♂ ESM. **ECUADOR** (25♂, 3♀): *Morona-Santiago*: Río Miriumi, nr. Sucúa 1000m Oct. 1♀ KWJH; *Napo*: Pimpilala 600m Sep. 1♂ KWJH; *Pastaza*: Hda. Moravia, nr. Shell 1200m Feb. 1♂ KWJH; Puyo 1000m Dec. 1♂ USNM; Puyo-Tena rd., km 31, 900m Jun. 1♂ DAT; Río Llandia 950m Aug.-Dec. 3♂ KWJH, 1♂ RCB; Shell Jun. Oct. 2♂ DAT, 1♂ KWJH; *Sucumbíos*: Limoncocha Dec. 1♂ USNM-error?; *Tungurahua*: La Mascota 1200m Aug. 1♂ AME; Río Topo Jul. Aug.-Oct. 3♂ USNM, 1♂ AME, 1♀ RCB; Río Tigre 1200m Aug. 1♂ AME; Río Zuñac 1300-1400m Jul. Sep. 3♂, 1♀ KWJH, 1♂ BMNH; *Not located*: Oriente 3♂ AMNH.

Additional locality data: **ECUADOR**: *Napo*: Pimpilala 600m Apr. Aug. Oct.; Río Shandia 550m Sep.; *Pastaza*: Río Puyo 1300m Oct. (Willmott & Hall, sight records).

Adelpha argentea Willmott & Hall, 1995

Figs. **109a,b**; 200a,b; *313*

Adelpha argentea Willmott & Hall (1995: 107, fig. 2a,b, 4)

TL: Río Machay, Tungurahua, Ecuador. **Types**: **KWJH**: **HT**♂: Río Machay, 1650m, 20 Apr. 1995; **PT**♂: same data as HT [both examined]

Identification, taxonomy and variation:

Adelpha argentea is a most distinctive species, superficially somewhat similar only to *A. shuara*. The pattern of the VFW discal cell is unique in the genus, with the first and second discal cell bars indistinct and merging to form a single black bar which is joined to the fourth discal cell bar posterior to a small, round pale spot. It is additionally distinguished from *A. shuara*, on the VHW, by not having a complete orange band from the costa to the anal margin basal of the white postdiscal band, and on the VFW by the pale postdiscal markings in cells Cu_1-M_3 and M_3-M_2 not being split by a dark brown line (i.e., the postdiscal series and postdiscal band are entirely fused). The ventral surface, with its rich reddish brown and silver ventral colours, is otherwise highly distinctive from all other species. There is some variation in the width of the hindwing postdiscal band, but I consider the differences slight and variable and to be infrasubspecific in nature.

Willmott & Hall (1995) described this species based on two Ecuadorian males, and stated that it was probably most closely related to *A. shuara*. The two species are certainly related, as discussed under *A. shuara*, but despite the different dorsal patterns, I believe that *A. argentea* is probably the sister species of *A. coryneta*. *Adelpha coryneta* has similar male genitalia to *A. argentea* and shares a number of wing pattern characters that I believe constitute compelling evidence that the two species are closely related. The two species both have the upper postdiscal band on the DFW reduced or absent in cells M_2-M_1 and M_1-R_5 and the orange tornal spot on the DHW absent, while on the VFW, the basal streak is not visible in the discal cell, the discal cell bars are indistinct and merged with the silver-grey ground colour of the cell, the first cell bar is inclined and there is an orange vertical dash distal of the white postdiscal band in cell Cu_2-Cu_1. The ventral ground colour of both wings is a distinctive, steely grey, the outer submarginal series are entirely replaced by a solid orange-brown band except in cells 2A-Cu_2 and Cu_2-Cu_1, where they are present as distinct white streaks surrounded by black, the VHW outer postdiscal series is entirely replaced by an orange-brown line, the area between the continuation of the second discal cell bar into cell Rs-Sc+R_1 and the postdiscal band is entirely filled with orange-brown, while the first and second cell bars in the discal cell are fused to form a single black line.

Range: *Adelpha argentea* has been recorded in the eastern Andes from southern Colombia to southern Peru, though it probably extends north at least as far as Meta in Colombia, and south into Bolivia.

Habitat and adult ecology: This is an extremely rare species and all of the specimens that I have examined have been collected since 1979. It is known from cloud forest habitats from 1600 to 2200m, and all male specimens have, to my knowledge, been collected in small areas of secondary growth near primary forest along streams or rivers, a microhabitat preference very similar to that of *A. shuara*. Males may be encountered perching singly or in small groups from 5-7m above the ground on the tops of secondary growth bushes, in the late morning and early afternoon. They maintain a particular leaf perch to which they return after making sorties around the immediate area and interacting with other passing butterflies. The same perching bush may be favoured for long periods of time; Jason Hall captured the holotype and paratype at Río Machay in 1994, while I captured a further male specimen perching on the same bush in 1998. Despite repeated visits to the type locality we have never seen specimens perching on any other bushes, or found the species to be attracted to baits of any kind, in sharp contrast to all other sympatric *Adelpha*.

Specimens examined: 10 (8♂, 2♀)

COLOMBIA (1♂, 1♀): *Caquetá*: Caquetá Sep. 1♂, 1♀ JFL. **ECUADOR** (6♂): *Napo*: Baeza 1♂ QCAZ; El Arrayán 20 Apr. 98 1♂ MJP; *Tungurahua*: Río Machay 1600m Apr. Jul. 3♂ KWJH; *Zamora-Chinchipe*: Cord. Lagunillas 1♂ AJ. **PERU** (1♂, 1♀): *Cuzco*: Buenos Aires, 0-7 km E., Río Cosñipata 2-2300m 6/12/79 G. Lamas 1♂ MUSM; *Junín*: Mina Pichita, 1-3 km S.E., 2100m 25/8/88 G. Lamas 1♀ MUSM.

Adelpha coryneta (Hewitson, 1874)

Figs. **110a,b**; 201a,b; 277a,b; *313*

Heterochroa coryneta Hewitson (1874: 8)

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: “B.M. TYPE No. Rh. 9840 Heterochroa coryneta ♂ Hew.//Bolivia Hewitson Coll. 79-69 Heterochroa coryneta 1.//Type//Syntype”; **BMNH**(M): **ST**♂: “Boliv.//Bolivia Hewitson Coll. 79-69 Heterochroa coryneta 3.” [both examined]

Adelpha coryneta Hew., Kirby (1877)

Identification, taxonomy and variation:

This is a highly distinctive species. Although superficially resembling members of the *A. iphiclus* group on the dorsal surface, in particular *A. thessalia*, the ventral surface with its steely grey ground colour, the absence of a basal streak in the VFW discal cell, the orange-brown outer postdiscal and submarginal series, and the silvery inner submarginal series on the VHW, easily distinguish the species from all others. There is slight variation in whether or not the upper postdiscal series is visible as a white spot in cell M_3-M_2 on the DFW.

Hewitson (1874) described this species based on an unspecified number of Bolivian males collected by Buckley, and the description is detailed and clearly refers to this taxon. I have examined two syntype males in the BMNH (Fig. 110a,b). Two males in the BMNH(M) bear the label “A. excepta St.”, an unpublished manuscript name.

This remarkable species appears to be most closely related to *A. argentea*, as discussed under that species. The principal differences are the white postdiscal band and greatly enlarged orange postdiscal series on the DFW, and the separate postdiscal series and postdiscal band on the DFW and VFW; these are separate on the VFW in *A. shuara*, *A salus* and most other members of the *A. cocala* group, and I regard their fusion in *A. argentea* as an autapomorphy. The colour of the postdiscal band is clearly genetically plastic, as evidenced by numerous *Adelpha* in which it is both geographically and individually dimorphic, but the enlarged orange postdiscal series on the forewing is a character unique within derived *Adelpha*, resembling the state in the relatively more primitive members of the *A. iphiclus* group. I do not believe the enlarged series that form the subapical marking to be homologous between *A. coryneta* and the latter group, since they are of distinctly different shapes, with the distal margin of the series in the *A. iphiclus* group being noticeably more basal with respect to the distal margin in cell M_1-R_5 than in cell M_2-M_1, while the margin of the series is parallel with the distal margin in *A. coryneta*. I therefore regard the enlarged orange DFW subapical marking in *A. coryneta* to be the result of mimetic convergence onto the dorsal wing pattern of *A. thessalia* and other sympatric *A. iphiclus* group species.

Range: This species has been recorded from San Martín in northern Peru to Bolivia. It is increasingly rare in the north of its range, and it is certainly possible that the species also occurs in southern Ecuador.

Habitat and adult ecology: *Adelpha coryneta* occurs in premontane rain forest and cloud forest habitats from 700-2400m, but the majority of specimens have been collected from 1000-1400m. The single record in the ZMHU of 3000m is almost certainly incorrect. It is apparently locally common in Bolivia, but rarer in Peru, and its habits and microhabitat preferences are probably similar to those of *A. argentea* and *A. shuara*.

Specimens examined: 52 (39♂, 13♀)

PERU (11♂, 4♀): *Cuzco*: Machu Picchu 2400m Apr. 1♀ MUSM; Rosalina 750m Feb. 1♂ AMNH; Vilcanota 3000m 1♂ ZMHU; *Huánuco*: Tambello Chico Canyon, Tingo María, 13 km S., Jun. 2♂ FSCA; *Junín*: Chanchamayo 700m Jan. 1♀ AMNH; Vitoc 900m May 1♂ MUSM; *Pasco*: Eneñas 1250-1450m Aug. 1♂ MUSM; *San Martín*: Jepelacio 4♂, 2♀ AMNH; *Not located*: no specific locality 1♂ AMNH. **BOLIVIA** (27♂, 9♀): *Cochabamba*: San Antonio 1800m 1♂ ZMHU; *La Paz*: Chulumani 1♂, 1♀ BMB; Coroico 6500' May 1♂, 3♀ MCZ, 2♂ BMNH, 1♀ ZMHU, 1♂ BMB; Hotel Río Selva Resort, Río Huarinilla 1000m Mar. 6♂ FSCA; La Paz 1♂ MNHN; Mapiri 1♀ BMNH; Puente Villa 1100-1200m May 1♂ FSCA; Río Songo 1200m 1♂ ZMHU; Río Songo-Río Suapi 1100m 1♂ BMNH; Río Tanampaya 2♂ ZMHU; Yungas de La Paz 1000m 3♂, 1♀ MUSM, 1♀ BMB; *Not located*: no specific locality 6♂, 1♀ BMNH. **COUNTRY UNKNOWN** (1♂): no specific locality 1♂ BMNH.

Adelpha jordani Fruhstorfer, 1913

Figs. **111a-d**; 202a-c; 278a,b; *314*

Adelpha jordani Fruhstorfer (1913: pl. 106d; 1915: 518)

TL: [Peru]. **Types**: **BMNH**(T): **ST**♂: “Syntype ♂ Adelpha jordani Fruhstorfer G. Lamas det. 1987//Peru H. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//TYPE//Type//Syntype”; **BMNH**(M): **ST**♂: “Peru H. Fruhstorfer//jordani Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Pach.”; **ST**?♂: “Fruhstorfer Coll. B.M. 1937-285//Peru Fruhstorfer”; **BMNH**(R): **ST**♂: “jordani Fruhst.//R//La Unión R. Huacamayo Carabaya 2000' Wet s. Nov. 1904 (G. Ockenden)//R” [all examined]

=*Adelpha ernestina* Fruhstorfer (1913: pl. 106b; 1915: 518) **syn. nov.**

TL: [Mapiri, Bolivia]. **Types**: **BMNH**(T): **ST**♂: “jordani ernestina Fruhst.//Bolivia Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//Syntype”; **BMNH**(R): **ST**♂: “S. Ernesto Bol. 1000m, 68° W. 15° S., IX. 00 (Simons)//jordani ernestina Fruhst.//106 d4//ernestina//R” [both examined]

Identification, taxonomy and variation:

Adelpha jordani is similar to a number of species, but is distinguished by its small size and rounded hindwing, absent or reduced orange subapical spot in cell M_2-M_1 on the DFW, and the lack of an orange spot in the DHW tornus. On the VFW, a vertical orange-brown line cuts through the pale band, separating the postdiscal series and postdiscal band, the inner submarginal series are complete, with a basally displaced, basally pointing V-shaped spot in cell Cu_1-M_3, and the postdiscal series are absent in cell 2A-Cu_2, with a black spot consequently representing the ground colour. On the VHW, the entire silver-grey postdiscal and submarginal series are distinctive, with the dashes of the outer postdiscal and inner submarginal series closely spaced, parallel, and both strongly basally displaced in cell M_3-M_2, so as to constrict the red-brown band between the postdiscal series. There is slight variation in the extent to which the orange DFW postdiscal band is constricted in cell Cu_1-M_3, and in the ventral colours, the ground colour varying from reddish to purplish brown, the postdiscal and submarginal series from silver-grey to purplish grey. I have examined three specimens, from Ecuador and Peru between 600-900m (marked in the list below with a †), which have the white DHW postdiscal band much reduced, so that it tapers to a point in cells Cu_2-Cu_1 and M_1-Rs, with an irregular basal edge lined with blue-grey scaling (Fig. 111c,d). The orange DFW band is also reduced in cell 2A-Cu_2 to a narrow orange marking situated in the anterior half of the cell, so that the band does not meet the anal margin, and on the VFW, in the same cell, the pale yellowish marking of the postdiscal band may be entirely absent. These specimens do not otherwise differ in any way in wing pattern or male genitalia from typical *A. jordani*, and I have also examined a specimen intermediate to these forms from Pampas del Heath in southern Peru, in which the white postdiscal band narrows anteriorly and posteriorly and the orange DFW band is narrowed in cell 2A-Cu_2. These forms are very similar to an analogous form occurring in *A. zina irma*, but may be distinguished from them by the orange DFW band being vertical, rather than slightly inclined, by the two separate pale submarginal dashes in cell M_2-M_1 on the VFW, instead of a single silvery spot, and by the black area immediately basal of the silver submarginal dash in cell 2A-Cu_2 on the VFW. This area is filled in *A. zina irma* by the pale coloration of the postdiscal series, which are absent in this cell in *A. jordani*.

Fruhstorfer (1913, 1915) figured the dorsal surface and described this species from an unspecified number of specimens from Peru, and I have examined a number of syntypes in the BMNH (Fig. 111a,b). The figure and description unambiguously refer to this taxon. Fruhstorfer (1913, 1915) also figured and described a new subspecies, *ernestina*, from a single specimen from Mapiri in Bolivia, in his collection. The syntype (intended holotype) in the BMNH(T) closely matches the original figure, and although it lacks a label indicating it to be from Mapiri, it is a not uncommon occurrence for Fruhstorfer specimens to lack information given in the original description. I have also examined the syntype in the BMNH(R) from San Ernesto and can find no consistent differences between Bolivian and Peruvian specimens, and I therefore synonymise *ernestina* with *jordani* (**syn. nov.**).

This species is most closely related to *A. zina*, with which it shares an identical configuration of the VHW and VFW postdiscal and submarginal series, the reduced or absent orange DFW subapical spot in cell M_2-M_1, and identical genitalia. The only difference between *A. jordani* and *A. zina*, apart from modifications of the postdiscal bands, is the separate postdiscal series in cell M_2-M_1 on the VFW, itself probably also a relatively weak character. *Adelpha milleri* also appears to be closely related, and shares with *A. jordani* and *A. zina* the reduced or absent orange DFW subapical spot in cell M_2-M_1.

Range: *Adelpha jordani* has been recorded to date from eastern Ecuador to Bolivia, with single specimens from northeastern Argentina, southeastern Brazil, and Guyana. The specimen from Argentina was collected recently by a local collector, A. Varga, who has confirmed the capture locality (pers. comm. to G. Canals, MLP), and there seems little reason to doubt its validity. The species therefore almost certainly also occurs in southeastern Brazil, though only a single, historical specimen is known. The Guianan specimen is also plausible but requires confirmation. Surprisingly, there are no records from Colombia or Venezuela, though the species almost certainly occurs in at least the former country. The *Adelpha* specimens reared by Moss (1933) in Pará, eastern Brazil, and identified by him as *A. jordani*, are in fact *A. heraclea*.

Immature stages: Unknown, those reported by Moss (1933) for this species actually apply to *A. heraclea*.

Habitat and adult ecology: This species is not uncommon throughout the Andean portion of its range, except for Colombia, where it has yet to be recorded, and in areas outside the Andes, where it is very rare. It is loosely associated with montane habitats, although it may be found in eastern Ecuador as far as 100 km from the base of the Andes. It has been recorded from 250-1200m and occurs in eastern Ecuador in a variety of habitats, from primary to selectively logged forest, along rivers and on ridge tops. Males may be readily attracted to traps baited with rotting fish in light gaps or along forest edges. The female is considerably rarer than the male and I have never observed it in the field. The species fluctuates slightly in abundance, being most common in the wet season and early dry season.

Specimens examined: 160 (157♂, 3♀) † - reduced postdiscal bands.

ECUADOR (18♂): “*Chimborazo*”: Río Bamba 1♂ MNHN-error; *Napo*: Apuya 600m Jul. Sep. 2♂, Aug. 1♂† KWJH; Río Coca Jun. 2♂ AME; Satzayacu 700m Apr. 1♂ KWJH; *Sucumbíos*: Garzacocha, La Selva, Río Napo 250m Feb. Apr. Oct. 3♂ PJD; *Tungurahua*: Río Llandia 950m Aug. 2♂(1†) KWJH; *Not located*: L. Napo 1♂ BMNH; no specific locality 2♂ AMNH, 1♂ BMB, 2♂ JFL. **PERU** (111♂, 2♀): *Huánuco*: Río Monzón 1000m Jul. 1♂ MUSM; Tingo María May-Aug. 7♂ FSCA, 6♂ AME, 1♂ USNM; *Junín*: Chanchamayo Jan. Dec. 1♂ BMNH, 1♂ ZMHU, 1♂ MCZ, 1♂ USNM; La Merced 2500' Jun. Jul. 1♂ BMNH, 5♂ BMB; Río Colorado 2500' 1♂ BMNH; Río Perené 18-2000' Dec.-Feb. 3♂ BMB, 2♂ MUSM, 1♂ BMNH; San Luis de Shuaro Aug. 2♂ MUSM; Satipo 7-800m May Sep. Nov. Dec. 4♂ BMNH, 10♂ AME, 8♂(1†) AMNH; *Loreto*: lower Río Tapiche Aug.

2♂ AMNH; Sarayacu 1♂ ZMHU; *Madre de Dios*: Boca Río La Torre Jul. Oct. 3♂ MUSM; Lagarto, Río Madre de Dios Aug. 1♂ MUSM; Pakitza 400m Oct. Nov. 13♂ MUSM; Pampas del Heath 220m Jun. 2♂ MUSM; Puerto Maldonado Oct. 2♂ USNM; Puerto Maldonado, 15 km N.E., 200m Jun. 1♂ MUSM; Puerto Maldonado, 30 km S.W., Oct. 5♂ USNM; Río de Las Piedras Oct. 1♂ MUSM; Shintuya 460m Jul. 4♂ AME; Tambopata Jun. 1♀ FSCA; *Pasco*: Chuchurras 1♂ MUSM; Pozuzo 1♂ BMB; *Puno*: Chaquimayo 2500-3000' Jun. Jul. 2♂ BMNH; La Unión Nov. 4♂ BMNH; Río Távara 800m Aug. 1♀ MUSM; *Ucayali*: San Marcos, Río Purus 350m Sep. 1♂ MUSM; *Not located*: Río Huallaga 2♂ AMNH; middle Río Ucayali Aug. 2♂ AMNH; no specific locality 3♂ BMNH, 3♂ BMB, 1♂ JFL. **BOLIVIA** (21♂, 1♀): *Cochabamba*: El Palmar 1600m Jan. May 3♂ AME; San Mateo 1♂ BMNH; Yungas del Espírito Santo 1♂, 1♀ BMNH; *La Paz*: Río Coroico Mar. 1♂ AMNH; Río Songo 1200m 2♂ ZMHU, 1♂ MCZ; San Ernesto 1000m Sep. 1♂ BMNH; *Santa Cruz*: Juntas 300m 1♂ BMNH, 4♂ ZMHU; *Not located*: no specific locality 3♂ BMNH, 3♂ AMNH. **ARGENTINA** (1♂): *Misiones*: Irigoyen, 1991 (*leg.* A. Varga) 1♂ MLP. **GUYANA** (1♂): *Potaro/Siparuni*: Potaro River 1♂ AME. **BRAZIL** (1♂): *Rio de Janeiro*: Petrópolis 1♂ BMNH-error?. **COUNTRY UNKNOWN** (5♂): Amazon 1♂ USNM; no specific locality 2♂ AME, 2♂ BMB.

Additional locality data: **ECUADOR**: *Napo*: Apuya Oct. Dec.; Chichicorrumi Sep.; El Capricho Oct.; Finca San Carlo Sep.; Río Yuturi 250m Oct.; Yasuní 300m Jul. Aug.; *Pastaza*: Puyo-Canelos rd., km 30, Oct.; Shell Oct.; *Sucumbíos*: Pañacocha 250m Oct. (Willmott & Hall, sight records).

Adelpha zina (Hewitson, 1867)

Figs. **112**; 203; 279; *314*

Identification, taxonomy and variation:

Adelpha zina is most similar to *A. justina*, with which it is usually confused in collections, although the nominate and most common subspecies of each are readily distinguished by the smooth distal edge of the orange DFW band in *A. zina*, with the distal edge protruding in cell M_3-M_2 in *A. justina*. All other subspecies are easily identified by using the dorsal wing pattern, but the characters that I have used to group the various taxa here require discussion. The male genitalia of the two species are identical, but there are two consistent wing pattern differences in the shape of the forewing postdiscal series and in the configuration of the postdiscal and submarginal series on the VHW. In *A. zina*, the distal edge of the postdiscal series on the forewing is closer to the distal margin in cell 2A-Cu_2 than in cell Cu_2-Cu_1, whereas it is closer in cell Cu_2-Cu_1 than in cell 2A-Cu_2 in *A. justina*. This character is visible on the ventral surface when the postdiscal series are absent on the DFW. *Adelpha zina* has the VHW inner postdiscal series typically curving slightly outwards as it nears the costa, whereas in *A. justina* it is straighter, and the ground colour of the area between the postdiscal series is reddish brown in *A. zina*, but tends to be a darker brown in *A. justina*. This reddish brown area in *A. zina* forms an almost even band which is broad throughout the wing, except where it is noticeably constricted in cell M_3-M_2; in *A. justina*, the band is typically narrower, it is more irregular in that the markings in each cell are more offset from one another at the veins, it is less noticeably constricted in cell M_3-M_2, and the markings in cells Cu_2-Cu_1 and Cu_1-M_3 are isolated and tend to be slightly curved, pointing distally. The outer postdiscal series in *A. zina* is typically present throughout the wing as silvery dashes, approximately half the width of the dashes of the inner submarginal series, while in *A. justina* these dashes are absent or represented only by sparse scaling, with the dashes of the inner submarginal series being much more pronounced. In general, the ventral surface ground colour of *A. zina* is more reddish and that of *A. justina* more orange-brown. I have also used characters present in neighbouring subspecies to group taxa, even if these are not present throughout the range of the species; for example, in addition to the characters discussed above, *A. z. lacina* also shares with *A. z. zina* the smoothly edged orange DFW band. Also, *A. zina* occurs at noticeably lower elevations compared with *A. justina*, which is confined to the Andes and the Sierra Nevada de Santa Marta, and this is a further character useful in establishing relationships between taxa. *Adelpha zina* is, however, perhaps even more closely related to *A. jordani*, from which it differs consistently only in having fused postdiscal series in cell M_2-M_1 on the VFW. Again, however, there is usually no difficulty in identifying taxa, since *A. jordani* always has a vertical orange DFW band and complete white DHW postdiscal band. Although Aiello (1984) also placed *A. zina* and *A. jordani* together, based on early stage characters, her *A. jordani* actually refers to *A. heraclea*, and I discuss this under Immature stages of *A. zina zina*. The configuration of the hindwing postdiscal and submarginal series otherwise readily distinguishes the species from all similar species.

There is substantial geographic variation within this species, in the expression of the postdiscal and submarginal bands on the dorsal surface, which may be entirely absent, and the VFW submarginal series, and seven subspecies are recognised.

The taxonomic arrangement adopted here is a hypothesis to be tested by workers in the field in appropriate regions. Deducing the relationships between the taxa of *A. zina* and *A. justina* has been greatly complicated by the lack of information on the distribution of all taxa within the biogeographically key regions of northwestern Venezuela and northern Colombia. Most taxa in this area are known from a single or handful of sites, some lack any precise locality data, and large areas remain in which no taxa have been recorded at all. The recent discovery of a number of new taxa in Venezuela will hopefully encourage workers there and in Colombia to seek out *A. zina* and *A. justina* in unexplored areas to clarify the taxonomy of these species.

Range and status: Nicaragua to southwestern Ecuador, the Sierra Nevada de Santa Marta, all Colombian cordilleras, Venezuela in the Cordillera de la Costa and Mérida, south in the foothills of the eastern Andes to Bolivia. In primary and disturbed lowland forest near mountains and premontane rain to cloud forest, from 200-2000m. Typically common, rare in certain peripheral regions.

Specimens examined: 538 (488♂, 50♀)

Adelpha zina zina (Hewitson, 1867)

Figs. **112a,b**; 203a,b; 279a,b; *314*

Heterochroa zina Hewitson (1867a: 48, pl. 26, fig. 7, 8)

TL: "New Granada"-Colombia. **Types**: **BMNH**(T): **ST**♂: "Illustrated in the Butterflies of Venezuela A. Neild, 1996//21//B.M. TYPE No. Rh. 9805 Heterochroa zina ♂ Hew.//N. Granada Hewitson Coll. 79-69 Heterochroa zina. 2.//Type//Syntype"; **BMNH**(M): **ST**?♂: "N. Granada Hewitson Coll. 79-69 Heterochroa zina. 1." [both examined]

=*Adelpha restricta* Fruhstorfer (1913: pl. 107f; 1915: 514)

TL: [Cananche, Cundinamarca (Colombia)]. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//zina restricta Fruhst.//Cananche Cundinamarca June '03 (M. de Mathan)//TYPE//Type//Syntype" [examined]

=*Adelpha zina leucacantha* Fruhstorfer (1915: 514)

TL: Colombia. **Types**: **BMNH**(T): **ST**♂: "Fruhstorfer Coll. B.M. 1937-285//zina leucacantha Fruhst.//Columbien ex coll. H. Fruhstorfer//TYPE//Type//Syntype" [examined]

=*Adelpha zina manetho* Hall (1938: 187) **syn. nov.**

TL: Ecuador. **Types**: **BMNH**(M): **ST**♂: Balzapamba, 3-4/94; **ST**?♀: "Zaruma Equateur M. de Mathan 1891//Ex Oberthür Coll. Brit. Mus. 1927-3" [both examined]

Adelpha zina Hew., Kirby (1871); *Adelpha justina zina* Hew., Lamas & Small (1992); *Adelpha zina zina* Hew., Neild (1996)

Identification, taxonomy and variation:

The nominate subspecies is distinguished from *A. z. lacina* in having a smaller white oval postdiscal spot on the DHW which does not, or only barely, enter cell Cu_2-Cu_1, and does not extend across cell M_1-Rs to reach the costa unbroken. Similar characters are apparent on the VHW. All other subspecies lack white on the DHW. *A. justina justina* is very similar, and several distinguishing characters are mentioned under the species account. The size of the white marking on the DHW varies, typically being present only in cells Cu_1-M_3, M_3-M_2 and M_2-M_1, but with occasional specimens having no white in cell Cu_1-M_3, a small white spot in the posterior half of cell Rs-Sc+R_1, or a small white triangle in the anterior half of cell Cu_2-Cu_1. There is slight variation in the thickness of the orange DFW postdiscal band. Specimens from the eastern slope of the Cordillera de Mérida in Venezuela have narrower, straighter orange DFW bands of more even width, more resembling the DFW band of *A. z. enope*, with slight brown scaling along the veins intruding into the distal and basal edges of the band. I have seen insufficient specimens to determine whether these slight differences are stable and merit subspecific recognition, and similar but less extreme variation occurs in some Colombian specimens, but given the possibly isolated nature of the Venezuelan population it may prove to be taxonomically distinct.

Hewitson (1867a) described this species based on an unspecified number of male specimens in his collection from New Granada, and the original description, figure of the dorsal and ventral surface and syntypes in the BMNH all clearly belong to this taxon. Fruhstorfer (1913) figured *A. restricta*, later placed as a subspecies of *A. zina*, from an unspecified number of specimens collected in June of 1903 in Cananche, Colombia, which he stated differed from the nominate in having a darker ventral surface, reduced white DHW marking and a narrower DFW band (Fruhstorfer, 1915). The differences observed in the syntype specimen in the BMNH, which closely matches the original figure in lacking white on the DHW in cells Cu_2-Cu_1 and M_1-Rs, with only a tiny white dot in cell Cu_1-M_3, are simple individual variation. The same is true for the characters cited by Fruhstorfer (1915) as distinguishing the Colombian *A. zina leucacantha* from the nominate, namely the lack of white in cell M_2-M_1 on the DHW, and the paler ventral surface and DFW band, and Hall (1938) correctly synonymised both *restricta* and *leucacantha* with *zina*. Hall (1938) went on to describe *manetho* based on a male and female from Ecuador in the BMNH, which supposedly differed from the nominate in having a narrower orange DFW band and larger white DHW spot. There are two females and a male of *A. zina* in the BMNH from Ecuador, and since Hall did not label his types it is not possible to say which of the females is a syntype. While Hall's cited differences are apparent in the syntype specimens, an examination of a much larger series from western Ecuador reveals there to be no consistent differences between these and Colombian specimens, and I therefore synonymise *manetho* with *zina* (**syn. nov.**).

Lamas & Small (1992) placed *zina* as a subspecies of *A. justina*, but as discussed under the species account there are clear wing pattern differences and the two are sympatric throughout the range of the latter.

Range: Eastern Panama to southwestern Ecuador, on both slopes of the Cordilleras Occidental and Central and the western slopes of the Cordillera Oriental in Colombia, and on the eastern slope of the Cordillera de Mérida in Venezuela. If the Mérida population is not distinct, then it is either disjunct or there remain large areas in which this subspecies has yet to be recorded, despite its abundance in the field. These areas include all of the Cordillera Oriental north of Bogotá, the Sierra de Perijá and the western slopes of the Cordillera de Mérida, where *A. z. desousae* may well occur. Although DeVries (1987) reports *A. zina zina* from Costa Rica, the taxon certainly does not occur there (see under *A. z. lacina*).

Immature stages: Aiello and Small (*In*: Aiello, 1984) reared this subspecies in Panama, and figured the mature larva and pupa (fig. 5). The early final instar larva is dark brown, paler dorsally, with pale scoli, tipped with black on T2, A7 and A8. Later, the colour changes to a mix of black and white, with an orange, longitudinal band joining the bases of the scoli on segments A2-A8. All the scoli terminate in a rosette of thin spines, the scolus on T2 is the longest, with those on T3, A7 and A8 being half the length, and all of these have short lateral spines. Remaining scoli are all very short and lack lateral spines, and the supraspiracular scoli appear to be absent except on T2. The pupa is tilted so that the ventral surface is superior, straw coloured with a dorsal metallic sheen from the head to segment A1, lacks prominent dorsal projections on T2 and A2 and has small, slightly laterally pointed head horns. The larva rests in the Front-Curved position (Aiello, 1984). Development times are given for each immature stage, and the minimum total development time is 30 days (Aiello, 1984).

Aiello (1984) speculated that *A. zina* and *A. heraclea* were closely related, based on the short scolus of A2, the habit of resting in the Front-Curved position and the similar pupal shape. However, a further reason for grouping these species was the smooth genitalic valvae of *A. zina* and *A. jordani*, Moss' *heraclea* being misidentified as the latter. *Adelpha heraclea* and *A. zina* actually have rather different genitalia, and the larval and pupal colouring are also different. Aiello (1984: 14) states the Front-Curved position is also used by other larvae when preparing to moult, so this may be a weak character. The pupal shape is not distinctive compared with other *Adelpha*, while the scoli are rather different in morphology between the two species; the T2 scolus of *A. zina* is long and tapering with short, sparse lateral spines, while that of *A. heraclea* is shorter and thicker with very dense lateral spines. The A2 scolus of *A. zina* is very short and lacks lateral spines, but that of *A. heraclea* is thick with dense lateral spines. Therefore I consider the reduction of the A2 scolus not to be homologous in the two species.

Habitat and adult ecology: This is a very common species in a variety of premontane forest habitats, from primary forest to disturbed secondary forest, both along rivers and on ridge tops. In western Ecuador it has been reliably recorded from 200-1300m, while there is a single record in western Colombia of 1700m. I have found males to be active during sunny periods, perching with their wings open 3-5m above the ground on bushes, usually in large light gaps and along paths and forest edges. Males are also readily attracted to traps baited with rotting fish, and to mammal dung. Females are more scarce and typically fly in areas with secondary growth. In Venezuela, Pyrcz (*In*: Neild, 1996) reports that the species occurs in cloud forest habitats from 900-1450m, in sunlit clearings in secondary forest. Throughout much of its range this subspecies is sympatric and probably involved in mimicry with *A. leucophthalma leucophthalma*, while the very similar *A. justina*, which occurs typically at higher elevations in western Ecuador, also appears to be partially sympatric elsewhere in its range (Neild, 1996).

Specimens examined (327♂, 22♀):

PANAMA (6♂, 5♀): *Darién*: Caña 900m Mar. May Jul. 4♂, 5♀ USNM; *Panamá*: Altos de Pacora 750m Mar. 2♂ USNM. **VENEZUELA** (1♂, 1♀): *Táchira*: Via Chorro del Indio Nov. 1♀ AFEN; *Not located*: no specific locality 1♂ ZMHU. **COLOMBIA** (283♂, 8♀): *Antioquia*: Antioquia 8000' Jul. 1♂ BMB; Medellín 2♂ AME, 2♂ BMB; Piedecuesta 8000' Jul. 1♂ BMB; Salinas 4-8000' Jul. 2♂ BMB; *Boyacá*: Muzo 4-800m Jun. Jul. 1♂ BMNH, 6♂ AME, 1♂, 1♀ USNM, 13♂ BMB, 1♂ MCZ; Otanche Aug. Oct. Nov. 2♂, 1♀ JFL, 1♂ ESM; head Río Carare 2-5000' 1♂ USNM; *Chocó*: Guarato Apr. 1♂ MUSM; Juntas, Río Tamaná, Río San Juan 400' Feb. 1♂ BMNH; *Cundinamarca*: Bogotá 178♂ BMNH, 6♂ USNM, 17♂ BMB, 5♂, 1♀ MNHN; env. de Bogotá 3♂ BMNH; Cananche Sep. 9♂ BMNH, 1♂ BMB; La Mesa 4000' May Jun. 1♂ BMB; no specific locality 1♂ BMNH; *Risaralda*: San Antonio de Chami 1700m 1♀ ESM; Santa Cecilia Dec. 1♂ ESM; *Tolima*: Río Chili Apr.-June 2♂ BMNH, 1♂ BMB; no specific locality 1♂ BMNH; *Valle del Cauca*: Juntas Feb. 1♀ BMNH; *Not located*: Interior 1♂ BMNH; Pipiral 1♂, 1♀ MNHN; no specific locality 6♂ BMNH, 1♂, 2♀ ZMHU, 1♂ AME, 2♂ USNM, 7♂ BMB, 2♂ MNHN. **ECUADOR** (23♂, 7♀): *Bolívar*: Balzapamba 1♂ BMNH; *Cotopaxi*: Angamarca 1♀ BMNH; *El Oro*: Zaruma 1♀ BMNH; *Los Ríos*: Río Palenque Sep. 1♀ FSCA; "*Napo*": Misahuallí 1♂ MUSM-error; *Pichincha*: Alluriquín 700m Mar. Jul. Sep. 6♂ USNM; Las Palmas 1000m Jun. 1♂ MUSM; old Quito rd. 1300m Jun. 1♀ DAT; Pisotanti Aug. 1♂ MUSM; Río Tanti 750m Jun. Jul. 3♂, 1♀ KWJH; Sto. Domingo 900-1200m May Jul. 1♂, 1♀ AME, 1♂ MNHN; Tinalandia May-Jul. 5♂, 1♀ FSCA, 1♂ DAT; *Not located*: no specific locality 1♂ BMB, 1♂ MCZ. "**PERU**" (1♂): no specific locality 1♂ USNM-error. **COUNTRY UNKNOWN** (13♂, 1♀): no specific locality 5♂ MCZ, 3♂ BMNH, 2♂ AME, 1♂, 1♀ USNM, 1♂ BMB, 1♂ MNHN.

Additional locality data: **ECUADOR**: *Cañar*: Manta Real 500m Aug.; *Carchi*: Lita, ridge east of Río Baboso 900m Mar. Jul. Aug.; *Esmeraldas*: Anchayacu 1000m Jul.; El Durango 300m Jul.-Sep.; El Encanto Jul.; Finca Durán 600m Jul.; La Punta 300m Mar. Jun. Aug.; Río Chuchuví Jul.; Río Piguambí 800m Jul.; *Manabí*: Cerro Pata de Pájaro 500m Aug. (Willmott & Hall, sight records).

Adelpha zina lacina (Butler, 1872)

Figs. **112c,d**; *314*

Heterochroa lacina Butler (1872b: 102, pl. 38, fig. 5)

TL: Cartago, Costa Rica. **Types**: **BMNH**(T): **ST**♀: "B.M. TYPE No. Rh. 9806 Heterochroa lacina ♀ Butl.//B.C.A. Lep. Rhop. Adelpha lacina Butl. Godman-Salvin Coll. 1916.-4.//H. lacina Butl. type//Costa Rica Van Patten Druce Coll.//Type H.T." [examined]

Adelpha justina Fldr., Boisduval (1870), D'Abrera (1987) in part, misid.; *Adelpha lacina* Butl., Kirby (1877); *Adelpha justina lacina* Butl., Fruhstorfer (1915), DeVries (1987), Lamas & Small (1992), Orellana (1996); *Adelpha zina* Hew., DeVries (1987); *Adelpha zina lacina* Butl., Neild (1996)

Identification, taxonomy and variation:

This subspecies is similar only to the nominate, and distinguished under that taxon. There is slight variation in the thickness of the white DHW postdiscal band, which may end at a point at vein Cu$_2$, or terminate broadly, extending into cell 2A-Cu$_2$ as slight whitish scaling. Though the orange DFW band is typically slightly more vertical than in the nominate subspecies, the syntype female has the orange DFW band much broader in cell 2A-Cu$_2$ and the basal edge is vertical, due to the presence of the postdiscal band in that cell.

Butler (1872b) described this taxon based on an unspecified number of specimens in Druce's collection from Cartago, in Costa Rica, collected by Van Patten. He stated that it differed from *A. leucophthalma* in having the DFW band angled toward the anal margin and touching it, and this is indeed true of the syntype female in the BMNH, discussed above, which was almost certainly the specimen figured. Usually, however, females lack the postdiscal band on the forewing in cell 2A-Cu$_2$ and the orange DFW band is thus more inclined. Combined with the elongated white postdiscal spot on the DHW, the dorsal surface is very similar to *A. justina justina*, with which the taxon was misidentified by Boisduval (1870) and treated as conspecific by most authors subsequent to Fruhstorfer (1915). However, Neild (1996) correctly placed it as a subspecies of *A. zina*, noting that it lacked the distal projection of the orange DFW band in cell M$_3$-M$_2$, while it also has VHW characters typical of this species (see discussion under *A. zina*). Although DeVries (1987) listed *A. zina zina* as occurring in Costa Rica, his figured specimen is from Colombia and the taxon certainly does not occur there, being replaced by *A. z. lacina*. I am uncertain which Costa Rican taxon DeVries (1987) regarded as *A. zina*, since he offered no characters to separate his "*A. zina*" and *A.* "*justina*" *lacina*, but it may be that he was referring to specimens of *A. z. lacina* with slightly reduced white DHW bands.

Range: Nicaragua to western Panama.

Habitat and adult ecology: This subspecies is rare in collections and females greatly outnumber males. In Costa Rica, it occurs from 700-2000m in cloud forest habitats, as rare, solitary individuals or in small, localised groups along forest edges and rivers (DeVries, 1987). Males perch in the subcanopy on sunny mornings, usually in light gaps.

Specimens examined (5♂, 17♀): † - trans. to *A. zina zina*.

NICARAGUA (1♀): *Chontales*: Chontales 1♀ BMNH. **COSTA RICA** (3♂, 10♀): *Cartago*: Irazú 6-7000' 1♀ BMNH; *Heredia*: Río Sarapiquí 700m Jun. Jul. 2♀ USNM; *Limón*: Guápiles 1♀ BMNH; *Not located*: no specific locality 1♂, 2♀ BMNH; Esperanza Jul. 1♂ BMNH, 1♂, 4♀ USNM. **PANAMA** (2♂, 6♀): *Chiriquí*: Chiriquí 1♀ BMNH; Santa Clara, Pacific slope 1200m Sep. 1♂ USNM; *Coclé*: La Mesa 800m May Jul. Aug. 5♀(1†) USNM; *Not located*: no specific locality 1♂ USNM.

Adelpha zina enope Hall, 1938 **stat. nov.**

Figs. **112e,f**; *314*

Adelpha irma enope Hall (1938: 185)

TL: Colombia. **Types**: **BMNH**(M): **HT**♂: "Holotype ♂ Adelpha irma enope Hall G. Lamas det. 1987//Ex Grose Smith 1910//Joicey Bequest Brit. Mus. 1934-120//Colombia//Tizona Feld. Colombia//Holotype"; **BMB**: **PT**♂: "Colombia Ex Rosenberg 1922//Paratype// Booth Mus. Coll. 000813" [both examined]

Identification, taxonomy and variation:

This subspecies is distinguished from *A. z. irma* by the narrow, even orange DFW band, which is typically not produced in cell M$_3$-M$_2$.

Hall (1938) described this subspecies as *A. irma enope*, from a male in the BMNH and a male in his collection. I regard it as a subspecies of *zina* for the same reasons as elaborated under *A. z. irma* (**stat. nov.**). The holotype (Fig. 112e,f) is rather extreme in its reduction of the orange DFW band, the paratype being slightly intermediate to *A. z. irma*, with the distal edge of the band protruding faintly into cell M$_3$-M$_2$. Since I have seen so few specimens, all with a complete lack of precise locality data, the validity of this subspecies may need to be reassessed when more material is available. It may prove to be a transitional form between *A. z. irma* and *A. zina zina*, the latter occurring further north in the Cordillera de Mérida, Venezuela.

Range: There are no specimens of this taxon with precise locality data, but based on slightly transitional specimens of *A. z. irma* I suspect that it occurs on the eastern slopes of the Cordillera Oriental in Colombia, to the north of Bogotá.

Habitat and adult ecology: This subspecies is very rare in collections and nothing has been reported on its habitat or behaviour, which are presumably similar to *A. z. irma*.

Specimens examined (4♂): † - trans. to *A. z. irma*, DFW band slightly irregular.

COLOMBIA (4♂): *Cundinamarca*: Bogotá 1♂ USNM, 1♂ MCZ; *Not located*: no specific locality 1♂ BMNH, 1♂† BMB.

Adelpha zina irma Fruhstorfer, 1907 **stat. nov.**

Figs. **112g,h**; 203d; *314*

Adelpha irma Fruhstorfer (1907: 171)

TL: Pozuzo, Peru. **Types**: **BMNH**(T): **ST**?♂: "Fruhstorfer Coll. B.M. 1933-131//irma Fruhst.//Peru H. Fruhstorfer//TYPE//Syntype//Type"; **BMNH**(M): **ST**♂: "Fruhstorfer Coll. B.M. 1933-131//Peru Pozuzo H. Fruhstorfer//Paratype" [all examined]

=*Adelpha irma nadja* Fruhstorfer (1907: 172)

TL: Bolivia. **Types**: **BMNH**(T): **ST**♂: "irma nadja Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Bolivie Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**♂: "Fruhstorfer Coll. B.M. 1933-131//Boliv.

Fruhstorfer//Paratype” [both examined]

=*Adelpha zina nicetas* Hall (1938: 208) **syn. nov.**

TL: Chanchamayo [Peru]. **Types**: **BMNH**(M): **HT**♂: “HOLOTYPE ♂ Adelpha justina nicetas Hall G. Lamas det. 1987//Type H.T.//Adelpha halli ♂ Fbs. Holotype det. WmTM Forbes 1962//BM(NH) Rhopalocera slide No. 9651//T.G.H.1962-532//Ex Oberthür Coll. Brit. Mus. 1927-3//Perou, Chanchamayo Oswald Schunke Reçu 1912” [examined]

Adelpha justina nicetas Hall, Orellana (1996)

Identification, taxonomy and variation:

This subspecies is distinguished from *A. z. enope* by the thicker orange DFW band, which has more uneven basal and distal edges, with the latter protruding in cell M_3-M_2. It is readily distinguished from all other subspecies by the broad, oblique orange DFW band and entirely dark brown DHW. There is some variation in the inclination of the orange DFW band, which may have the upper portion positioned more distally and the markings in cells 2A-Cu_2 and Cu_2-Cu_1 more basally, so that it appears more vertical overall. The orange DFW subapical spots, though typically entirely absent, may very occasionally all be present, and vary slightly in size. The VHW postdiscal band is usually present as isolated, pale greyish spots, but specimens with the more vertical DFW band often have an almost complete postdiscal band, which is narrow, irregular at its distal edge and tapers to a point at vein Cu_2. There may be blue-grey scaling representing the postdiscal band on the DHW, either in a continuous, narrow band from cells Cu_2-Cu_1 to M_2-M_1, or as indistinct, sparse scaling anywhere in this area (in one specimen from Río Colorado, Peru, in the BMNH(M), this scaling is orange). Forms with this DHW band closely resemble certain forms of *A. jordani*, but differ in having fused postdiscal series in cell M_2-M_1 on the VFW, and in lacking the pale marking in cell 2A-Cu_2 on the VFW representing the postdiscal band, instead having a pale yellowish marking representing the postdiscal series in this cell placed immediately basal of the silver-grey inner submarginal series dashes, where there is large black spot in *A. jordani*. These forms are connected by intergrades to typical *A. z. irma*, occur sympatrically and are rare in collections. In eastern Colombia occur specimens transitional to *A. z. enope*, having a slightly thinner orange DFW band with a smoother basal edge and reduced orange DFW subapical spots. These are marked with a ‡ in the list below.

Fruhstorfer (1907) described this taxon from two males in his collection from Pozuzo in Peru, and the description specifically mentions one of the distinguishing features of *A. zina*, the three silver-grey VHW postdiscal and submarginal bands, with the distal-most displaced basally in cell M_3-M_2. There is one syntype in the BMNH(M) labelled as from Pozuzo and one simply labelled Peru in the BMNH(T) with a red TYPE label, which are probably the two syntypes. There are other specimens in the BMNH(M) labelled from Peru from Fruhstorfer’s collection, most with paratype labels, but these are not valid syntypes as they were not mentioned in the original description. However, all are of the same taxon, which was clearly figured later by Fruhstorfer (1913: pl. 108c). Fruhstorfer (1907) also described a further subspecies, *nadja*, based on a broader DFW band and more silvery ventral bands, but these putative differences are just individual variation and the name was synonymised with *irma* by Hall (1938). Hall (1938) described, as *A. zina nicetas*, a male specimen from the Oberthür collection in the BMNH, from Chanchamayo, which differs from typical *A. z. irma* in having a slightly more vertical orange DFW band and a thin, blue-grey postdiscal band in the middle of the DHW. The dorsal surface of this specimen was figured by D’Abrera (1987: 638) as “*Adelpha* sp. Forbes M/S”, and indeed, since Hall failed to label it as his holotype, Forbes was intending to describe it as a new species. This specimen, and the female figured beside it (D’Abrera, 1987: 638), are just aberrant forms of *A. z. irma* as discussed above (such forms are marked in the list below with a †), and I synonymise *nicetas* with *A. z. irma* (**syn. nov.**).

This taxon was described by Fruhstorfer (1907) as a distinct species, and treated as such by all subsequent authors. The only principal difference between it and *A. zina zina*, apart from the absence of a white postdiscal marking on the DHW, is the protruding distal edge of the orange DFW band in cell M_3-M_2, representing the postdiscal series, which is otherwise typically absent in most other subspecies of *A. zina*. However, in *A. z. enope*, regarded by Hall (1938) and subsequent authors as a subspecies of *A. irma*, this orange spot is also absent, while it is present in *A. z. inachia*. There are no consistent ventral wing pattern differences between *A. z. irma* and *A. z. zina*, a fact which lead Hall (1938) to describe *nicetas* as a subspecies of *A. zina*. The narrow orange DFW band of *A. z. enope* is very similar to the shape of the forewing band in the neighbouring population of *A. z. zina*, in the Cordillera de Mérida, suggesting the possibility of some gene flow. Since *A. z. irma* and other subspecies of *A. zina* are closely allopatric and fly in similar habitats, and cannot be distinguished by any fundamental wing pattern (or, needless to say, genitalic) differences, I regard *irma* as a subspecies of *zina* (**stat. nov.**).

Range: The east Andean slope from Colombia, near Bogotá, to Bolivia.

Habitat and adult ecology: This subspecies is widespread and not uncommon to common in premontane rain forest and cloud forest from as low as 600m at the base of the Andes to 1600m, though typically it is encountered from 1000-1400m. It occurs in both primary forest and in areas with substantial secondary growth, both on ridge tops and along rivers, and is present throughout the year. It flies in the company of *A. irmina*, *A. boreas*, *A. salmoneus* and *A. ximena ximena*, with which it is probably involved in mimicry. Males are readily attracted to traps baited with rotting fish in light gaps or along rivers, and also puddle at damp sand, while the female is extremely rare and nothing is known of its behaviour.

Specimens examined (131♂, 2♀): † - “*nicetas*” form; ‡ - trans. to *A. z. enope*.

COLOMBIA (5♂): *Meta*: Río Negro May 2♂(1‡) ESM; *Nariño*: San Pablo de Bijagual al Carmen, via a Orito 13-1500m Sep. 1♂ MHNUC; *Not located*: Pipiral 1♂ MNHN; no specific locality 1♂‡ BMB. **ECUADOR** (14♂, 1♀): *Napo*: Río Chalayacu Oct. 1♂ DAT; Río Hollín Sep. 1♂ DAT; Tena-Loreto rd., km 49, 1350m Sep. 1♂ KWJH; *Pastaza*: Shell 1050m Feb. Jun. Oct. 3♂ KWJH, 1♂ DAT; *Tungurahua*: Río Negro 1200m May 2♂ AME; Río Zuñac 1300m Jul. 1♂ KWJH; Topo 1250-1700m Apr. Sep. 2♂ AME, 1♂, 1♀ USNM; *Not located*: no specific locality 1♂ USNM. **PERU** (89♂, 1♀): *Amazonas*: Alfonso Ugarte 1000-1200m Jul. 1♂ MUSM; *Cuzco*: E. of Buenos Aires, Cosñipata 1200-1500m Dec. 1♂ MUSM; Marcapata 4000' Feb. 1♂ BMNH, 1♂ MCZ; Quebrada Quitacalzón 1050m May Sep. 1♂ USNM, 1♂ MUSM; *Huánuco*: Tingo María Mar. May Sep. 1♂ FSCA, 4♂ AME; *Junín*: Chanchamayo 10♂(1†) BMNH, 3♂(1†) ZMHU, 1♂ AME, 1♂ USNM, 4♂ BMB; La Merced 25-4500' Jan. Feb. Jul.-Nov. 13♂ BMNH, 1♂ AME, 9♂(1†) BMB; La Merced 2500' Jul. Aug. 1♂†, 1♀† BMNH; Pichis & Perené Rivers 2-3000' 2♂ USNM; Río Colorado 2500' Mar. Apr. Aug. Sep. 2♂ BMNH, 1♂ AME, 4♂ BMB; Río Perené 1♂ MUSM; Satipo Jun. Jul. Dec. 3♂ AME; *Loreto*: Yurimaguas 1♂ ZMHU; *Pasco*: Oxapampa 1♂ MUSM; Pichis Rd. 3000' 2♂ BMB; Pozuzo 800-1000m 3♂ BMNH, 2♂ BMB, 1♂ MUSM; *Puno*: La Oroya 3100' Nov. Dec. Jan. 4♂ BMNH; San Gaban 2500' 1♂ BMNH; Sto. Domingo 6000' Jul. Aug. 2♂ BMNH; *Not located*: no specific locality 7♂ BMNH, 2♂ BMB. **BOLIVIA** (21♂): *Beni*: Río Quiquibby 600m Sep. 1♂ KWJH; *Cochabamba*: Yunga del Esp. Santo 1♂ BMNH; *La Paz*: Coroico 1200m 1♂ USNM, 2♂ MCZ; Río Songo 1200m 4♂(1†) ZMHU; San Augustín 3500' Oct. 1♂ BMNH; Yungas 1000m 1♂ BMNH, 1♂ BMB; *Santa Cruz*: Río Juntas 1000m 1♂ ZMHU; *Not located*: no specific locality Aug. 4♂ BMNH, 3♂ BMB, 1♂ MCZ. **COUNTRY UNKNOWN** (2♂): no specific locality 2♂ AME.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Abanico 1600m Nov.; *Napo*: El Capricho 850m Oct.; Tena-Loreto rd., km 49, Mar. Aug. Oct.; *Pastaza*: Hacienda Moravia Feb.; *Sucumbíos*: La Bonita-Rosa Florida rd., km 15, Mar.; Quebrada El Copal Nov.; Río Palmar Nov.; *Zamora-*

Chinchipe: Quebrada Chorillos Nov. (Willmott & Hall, sight records).

Adelpha zina inachia Staudinger, 1886

Figs. **112i,j**; *314*

Adelpha olynthia inachia Staudinger (1886: 143)

TL: Sierra Nevada, Colombia. **Types**: **ZMHU**: **HT**♀: "Inachia Stgr.//Origin//Columbia S. Nevada//Holotype" [examined]

=*Adelpha olynthia levicula* form *inachia* Fruhstorfer (1915: 514) **preocc.** Staudinger (1886), unavailable name

TL: not stated. **Types**: **ZMHU**: **ST**♀: "Inachia Stgr.//Origin//Columbia S. Nevada//Holotype" [examined] NB - also HT of *inachia* Stdgr.

Adelpha justina inachia Stdgr., Orellana (1996); *Adelpha olynthia inachia* Fruhst., Neild (1996); *Adelpha zina inachia* Stdgr., Willmott & Hall (1999)

Identification, taxonomy and variation:

This subspecies is readily distinguished from all others by the only dorsal markings being the orange postdiscal series on the forewing, which are also present in cell M$_3$-M$_2$ as faint orange scaling. On the VHW, *A. z. desousae* is also distinguished by having thicker silvery grey inner postdiscal series. This subspecies is very similar also to *A. justina maira*, which has a much more pronounced orange spot in cell M$_3$-M$_2$, traces of the upper postdiscal band and wider orange markings in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$ on the DFW, in addition to other characters that distinguish *A. justina* from *A. zina*. The syntype female differs from the male in the ZMHU and the male in the BMNH in having heavier orange markings on the DFW and a small, pale postdiscal spot at the VHW costa. The male in the MUSM resembles *A. justina justina* in having a white DHW postdiscal marking in cells Cu$_2$-Rs, broader orange postdiscal spots on the DFW in cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$, and the upper postdiscal band present. I regard this as a specimen of *A. zina*, rather than *A. justina*, on the basis of the characters discussed under the species account, in addition to the shape of the postdiscal series on the DFW. The syntype female of *A. z. inachia* has the basal edges of the orange DFW postdiscal series spots distinctly concave in cells M$_2$-M$_1$ and M$_1$-R$_5$, as in the MUSM male, while the distal-most orange spot (the postdiscal series) in cell M$_3$-M$_2$ is much smaller than the spot in cell M$_2$-M$_1$. In all subspecies of *A. justina* the orange spot in cell M$_3$-M$_2$ is much larger than that in cell M$_2$-M$_1$. The only wing pattern difference in the MUSM male, compared with the syntype female, is the presence of the postdiscal band on both wings between veins Cu$_2$-R$_5$, and I regard this specimen as either an aberration or a form that occurs with typical *A. z. inachia*. The loss of the hindwing postdiscal band occurs in many other subspecies of *A. zina*, and its presence or absence is a weak character.

Staudinger (1886) described this subspecies from a single female from Sierra Nevada in Colombia, and the description clearly applies to the holotype in the ZMHU. Fruhstorfer (1915) appears to have been unaware of Staudinger's description, and redescribed the name "having been thus denominated by Staudinger in his collection" as a form of *A. olynthia levicula*, which he stated was an "incidental aberration". There is no mention of the specimen on which the name is based, but presumably it is the holotype of *inachia* Staudinger. Although Fruhstorfer also stated that the white postdiscal band of the forewings was absent, this is presumably an error and he was in fact referring to the hindwings. The name is unavailable since it is a quadrinomial, but it is in any case preoccupied by Staudinger's name and also a synonym, being based on the same type specimen. Presumably Staudinger (1886) associated this taxon with *A. olynthia* due to the thin orange DFW band, but in fact an examination of the ventral surface shows the orange DFW band in *A. z. inachia* to be composed of the postdiscal series, with the postdiscal band entirely absent, but in *A. olynthia* to be composed of the fused postdiscal series and postdiscal band. The closely spaced and parallel postdiscal series and inner submarginal series on the VFW indicates that this taxon is not a subspecies of *A. olynthia*, while the configuration of the VHW postdiscal and submarginal series exactly resemble those of *A. zina*; the postdiscal series are separated by a broad, red-brown band, constricted in cell M$_3$-M$_2$, while the outer postdiscal series are visible throughout and closely parallel to the inner submarginal series. Although the orange postdiscal spot in cell M$_3$-M$_2$ on the DFW is typically absent in *A. zina*, it is present in *A. z. irma* and therefore its presence or absence can not be considered a specific character. This taxon also differs in several respects (discussed above) from *A. justina*, the only other similar species with which it might be conspecific and of which it was placed as a subspecies by Orellana (1996), and I therefore follow Willmott & Hall (1999) in treating it as a subspecies of *A. zina*.

Range: Sierra Nevada de Santa Marta in Colombia.

Habitat and adult ecology: *Adelpha z. inachia* is very rare in collections, but this probably just reflects its limited geographic range. It has been recorded from 1000-1300m, possibly up to 1600m, and collected in April and August.

Specimens examined (3♂, 1♀): † - postdiscal band present between veins Cu$_2$-R$_5$.

COLOMBIA (2♂, 2♀): *Magdalena*: 3 miles S.E. of San Pedro de la Sierra, Santa Marta, 13-1600m Adams & Bernard Aug. 1♂ BMNH; *Not located*: Casa Blanca, Sierra Nevada de Santa Marta 1000-1200m Apr. (Dr. Schultze) 1♂ ZMHU, 1♂† MUSM; Sierra Nevada 1♀ ZMHU.

Adelpha zina desousae Neild & Orellana, 1996 **stat. nov.**

Figs. **112k,l**; *314*

Adelpha irma desousae Neild & Orellana (*In*: Neild, 1996: 32, pl. 1, figs. 17, 18)

TL: 13 km S. de Sanare, Parque Nacional Yacambú, Lara, Venezuela. **Types**: **MALUZ**: **HT**♀: 13 km S. de Sanare, 15-21 Jan. 1979, *leg.* A. Timuare [sic], T. Borrego [original photograph examined]

Identification, taxonomy and variation:

This subspecies is distinguished from all other subspecies, with the exception of *A. z. pyrczi*, by the entirely brown dorsal surface. It is distinguished from *A. z. pyrczi* by the lack of the pale yellowish postdiscal spots on the VFW in cells M$_3$-R$_5$ and in the base of cells Cu$_2$-Cu$_1$ and Cu$_1$-M$_3$, representing the postdiscal band, and by the lack of a pale whitish streak, with a sharply defined basal edge and diffuse distal edge, in the postdiscal area of the VHW.

Neild & Orellana (*In*: Neild, 1996) clearly figured both surfaces and described this taxon as a subspecies of *A. irma*, based on the unique female holotype, of which I have examined a photograph (Fig. 112k,l), courtesy of Andrew Neild. The taxon is certainly very similar to *A. z. irma*, but also to *A. z. zina*, and even more so to *A. z. inachia*, from which it differs only in having smaller silver-grey spots in the postdiscal series on the VFW and a thicker inner postdiscal series on the VHW. It differs notably from *A. z. irma* on the VHW by lacking the pale postdiscal streak. Since this taxon has no fundamental wing pattern characters separating it from typical *A. zina zina*, with which it is apparently allopatric, and since I regard both *inachia* and *irma* as subspecies of *A. zina*, I place it as a subspecies of *A. zina* (**stat. nov.**).

Range: To date this subspecies is known only from the vicinity of the type locality, which lies in the Sierra de Portuguesa at the northwestern tip of the Cordillera de Mérida in Venezuela. Neild (1996) suggests that its range probably also extends along the western slopes of the Cordillera de Mérida, based on the ranges of other subspecies occurring at the type locality.

Habitat and adult ecology: This is a rare subspecies, of which only the holotype appears to be known in collections. Andrés Orellana (*In*: Neild, 1996) believes it to be very localised, for despite many visits to the type locality, he has only encountered it once, when it was not uncommon. According to Neild (1996) it has been recorded from 1200-1800m in cloud forest habitats.

Specimens examined (1♀):
VENEZUELA (1♀): *Lara*: 13 km S. de Sanare 1♀ MALUZ(photograph).
Additional locality data: **VENEZUELA**: *Lara*: nr. Caspo, Sanare (Neild, 1996).

Adelpha zina pyrczi Neild & Orellana, 1996 **stat. nov.**

Figs. **112m,n**; 203c; *314*

Adelpha olynthia pyrczi Neild & Orellana (*In*: Neild, 1996: 33, pl. 1, figs. 29-31)

TL: Portachuelo Pass, Henri Pittier National Park, Aragua, Venezuela. **Types** (all Venezuela): **BMNH**(M): **HT**♂: "Adelpha olynthia pyrczi Neild & Orellana, 1996 HOLOTYPE//Illustrated in the Butterflies of Venezuela A. Neild, 1996//Brit. Mus. 1991-65//Donated by T. Pyrcz//Adelpha s.sp. ♂ April '87 1100m//Portochuelo Pass Henri Pittier Nat. Park Aragua, Venezuela//Holotype"; **AFEN**: **PT**♂: Portochuelo Pass; **PT**♀: Rancho Grande; **PT**♀: Turmero; **AME**: **PT**♂: Portochuelo Pass 24 Jul. 1981 Lee D. Miller; **PT**♀: Rancho Grande, P.N. Henri Pittier 1200m Aug. 1 1974, T.E. Pliske [all examined]; **TP**, **HS**, **RM**, **MHNH**, **R**, **AO**, **JCS**: 22**PT**♂, 30**PT**♀: Rancho Grande, Aragua; Los Naranjos, Aragua; Portochuelo Pass, Aragua; Maracay-Choroní km 30-31, Aragua; Choroní, Aragua; via Río Borburata, Carabobo [not examined - full type data in Neild (1996)]

Identification, taxonomy and variation:

This subspecies is distinguished from *A. z. desousae* by having pale spots representing the upper postdiscal series on the VFW, the submarginal series on the VFW are less basally displaced in cells Cu_1-M_3 and M_3-M_2, being more parallel with the distal margin, and the postdiscal area of the VHW has an uneven, vertical paler line representing the postdiscal band. There are variable traces of orange scaling on the DFW around the basal edges of the paler brown area indicating the obsolete postdiscal band, while occasional specimens also have traces of orange scaling in the postdiscal area of the DHW. *Adelpha z. pyrczi* also differs from all other subspecies of *A. zina* in the hindwing having a straighter distal margin, so that it appears squarer in shape.

Neild & Orellana (*In*: Neild, 1996) described and clearly figured this taxon as a subspecies of *A. olynthia* from specimens collected in the Venezuelan Cordillera de la Costa. The type series must surely be the longest for any newly described *Adelpha* taxon, and it is remarkable that it was not described earlier, since Boisduval, Hall and Forbes all attached manuscript names to various specimens. Neild & Orellana tentatively regarded it as a subspecies of *A. olynthia* on the basis of a similar ventral pattern, wing shape and cloud forest habitat, but also mentioned the possibility that it might prove to be a distinct species. *Adelpha olynthia*, despite being by far the most abundant species of *Adelpha* in the areas in which it occurs, has never been recorded in the intervening Venezuelan Cordillera de Mérida, and I suspect that it does not occur there. While *A. olynthia* occasionally occurs as low as 1200m, it is more typical of middle elevation cloud forests and other east Andean *Adelpha* with similar altitudinal ranges, such as *A. saundersii* and *A. corcyra*, are also absent in the Venezuelan Cordillera de Mérida and de la Costa. A number of wing pattern characters distinguish the taxon from *A. olynthia*, including, most importantly, the closely spaced and parallel postdiscal and inner submarginal series on the VFW (these are much further apart in cells Cu_2-Cu_1 and Cu_1-M_3 than in cell M_2-M_1 in *A. olynthia*), the straighter silver-grey dash of the inner submarginal series in cell Cu_1-M_3 on the VFW (distinctly U-shaped in *A. olynthia*), the distinctly separate postdiscal series and postdiscal band on the VFW (these are fused in *A. olynthia*), and the very broad outer postdiscal series on the VHW, the dashes of which are thicker than those of the inner submarginal series (in *A. olynthia* the outer postdiscal series is only barely visible as very sparse silver-grey scaling). All of these characters point to *pyrczi* being more closely related to *A. zina* and *A. jordani*, while the fused postdiscal series on the VFW in cell M_2-M_1 is a character shared with all subspecies of *A. zina* but not *A. jordani*. *Adelpha jordani* is unknown in Venezuela, or even eastern Colombia, while there are two *A. zina* subspecies occurring in Venezuela that are closely allopatric in lower elevation cloud forest habitats similar to those of *pyrczi*. However, these two neighbouring subspecies of *A. zina*, both in the Cordillera de Mérida (*z. zina* and *z. desousae*), do not particularly closely resemble *pyrczi*, which has a clearly vertical VFW postdiscal band with the upper portion not contiguous with the postcellular bar, a straight, pale thread indicating the basal edge of the VHW postdiscal band, and the inner submarginal series on the VFW less basally displaced in cell Cu_1-M_3, being further from the postdiscal series in cell 2A-Cu_2. Some specimens of *A. z. irma* resemble *A. z. pyrczi* in the first two, but not the last two of these characters. The latter two characters may be correlated with, and therefore not independent of, the shape of the DFW postdiscal band, and since this may be subject to strong selective pressure to evolve to mimic sympatric taxa, I regard it as a relatively weak character. *Adelpha z. pyrczi* is perhaps most closely related to *A. z. irma*, but is possibly the most primitive subspecies of *A. zina*, with all of the remaining taxa having more sinuate postdiscal and submarginal series, and it appears to be a relatively isolated taxon. Since *pyrczi* lacks clear wing pattern or genitalic characters separating it from *A. zina*, and is allopatric in similar habitats, I believe it is best considered a subspecies of *A. zina* for the present (**stat. nov.**). Future collecting is necessary in the Cordillera de la Costa and neighbouring areas to test this taxonomic hypothesis.

Range: All records to date of this subspecies are from a very small area in the Parque Nacional Henri Pittier, in Aragua, with one record from the neighbouring state of Carabobo. It has not, to my knowledge, been recorded in the Caracas area or further east.

Habitat and adult ecology: *Adelpha z. pyrczi* has been recorded from 1000-1400m in cloud forest habitats, where it flies throughout the year and appears to be common.

Specimens examined (18♂, 7♀):
VENEZUELA (17♂, 7♀): *Aragua*: Portochuelo Pass, P.N. Henri Pittier 1100m May Jul. Dec. 2♂, 2♀ MUSM, 2♂ BMNH, 1♂ AFEN, 1♂ AME; Rancho Grande, P.N. Henri Pittier 1100-1200m Apr.-Jun. Aug. 1♀ AME, 7♂ USNM, 1♀ FSCA, 4♂, 1♀ AMNH, 1♀ AFEN; Turmero 1400m Jun. 1♀ AFEN. "**COLOMBIA**" (1♂): no specific locality 1♂ BMNH-error.
Additional locality data: **VENEZUELA**: see type data above (Neild, 1996).

Adelpha milleri Beutelspacher, 1976

Figs. **113a,b**; 204a,b; 280a,b; *314*

Adelpha milleri Beutelspacher (1976: 8. fig. 1A,B, 2A,B, 3)

TL: Cerro El Vigía, Santiago Tuxtla, Veracruz, Mexico. **Types** (all Mexico): **UNAM**: **HT**♂: Cerro El Vigía, 9 Jul. 1967, *leg.* C. R. Beutelspacher [original photograph examined]; **PT**♂, 2**PT**♀: same locality as HT, Aug.; **ADF**: **PT**♀: Santa Rosa, Las Margaritas, Chiapas May;

5**PT**♂: same locality as HT, Jun.-Sep. **RDM**: 3**PT**♂, 9**PT**♀: same locality as HT, Apr. Jun.-Oct. [not examined]

Limenitis (Adelpha) oberthurii Boisd., Ross (1976) misid.?

Identification, taxonomy and variation:

Adelpha milleri is superficially most similar to *A. boeotia oberthurii*, from which it is distinguished by lacking a well developed orange subapical spot on the DFW in cell M_2-M_1 and by the lack of an orange tornal spot on the DHW. The ventral surface has broad, reddish brown marginal borders, which lack the silvery dashes of the outer submarginal series, the silver-grey dashes representing the inner postdiscal series are absent but the outer postdiscal series is pronounced, lying very close and parallel to the inner submarginal series and being noticeably displaced basally in cell M_3-M_2. The narrow dorsal postdiscal bands, with the forewing band white in cell 2A-Cu_2, the reddish ventral ground colour, the separate postdiscal series and postdiscal band on the VFW, and the closely spaced, pairs of silver dashes composing the outer postdiscal and inner submarginal series on the VHW, distinguish this species from all other similar species.

Beutelspacher (1976) described this species from a long series of specimens, the majority of which, including the holotype, were collected on Cerro El Vigía in Veracruz. The dorsal and ventral surfaces of a male and female, presumably the holotype and a paratype, and the male genitalia, are also illustrated, and there is therefore no doubt as to the identity of the taxon.

This species is closely related to *A. jordani*, *A. zina*, *A. justina* and *A. olynthia*, as evidenced by the male genitalia, which lack spines on the posterior tip of the valvae, the female genitalia, which lack sclerotised bands on the corpus bursae, and the wing pattern, which lacks an orange DHW tornal spot and has both the outer postdiscal and inner submarginal series parallel and expressed throughout as closely spaced silver-grey dashes, which are basally displaced in cell M_3-M_2. *Adelpha milleri* is the only one of these species to consistently express both the postdiscal band and the postdiscal series in cell 2A-Cu_2 on the VFW, and the only one in which the postdiscal series and postdiscal band on the VFW are always clearly separated throughout. As in *A. jordani*, the postdiscal series are distinct in cell M_2-M_1 on the VFW, and with this species and *A. zina* it shares the reduction of the orange subapical spot in cell M_2-M_1 on the DFW. Since *A. jordani* and *A. zina* appear to be sister species, *A. milleri* is therefore probably the sister species to *A. jordani* and *A. zina*. The inner postdiscal series on the VHW is typically entirely lost, although it is expressed to some extent in females, the distal edge of the white hindwing postdiscal band is very straight, and the outer submarginal series on both wings are almost entirely lost, all characters that distinguish this species from its close relatives. Its range, in cloud forest in Mexico, is intriguing in terms of the evolution of this small group of species, the majority of which are purely Andean, and it is very probable that a further related species or subspecies will be found in the poorly explored montane areas of Guatemala, Honduras and Nicaragua.

Range: This species, as far as is known, is endemic to Mexico, and almost all specimens have been collected in the Tuxtlas mountain range in Veracruz, with a single specimen reported in the type series and a single literature record (de la Maza & de la Maza, 1993) from the state of Chiapas.

Habitat and adult ecology: *Adelpha milleri* occurs in premontane evergreen rain forest from 100-1000m, and has been collected from March to October (de la Maza, 1987; de la Maza & de la Maza, 1993). Judging from specimens in collections, it is locally common, with females being equally or more frequently encountered than males. Ross (1976) encountered two males of an *Adelpha* that was probably this species, although he reported it as *Limenitis oberthurii*, along sunny trails in the Sierra de Tuxtla.

Specimens examined: 16 (8♂, 8♀)

MEXICO (8♂, 8♀): *Veracruz*: Catemaco Aug.-Oct. 6♂, 2♀ AME; El Vigía Apr. Aug. Sep. 2♂, 3♀ AME; Sontecomapan Mar.-May 3♀ AME.

Additional locality data: **MEXICO**: *Chiapas*: Cuenca de Grijalva (de la Maza & de la Maza, 1993); *Veracruz*: Santiago Tuxtla (de la Maza, 1987); Est. Biol. Los Tuxtlas (Raguso & Llorente, 1991).

Adelpha justina (C. & R. Felder, 1861)

Figs. **114**; 205; *315*

Identification, taxonomy and variation:

Adelpha justina is most similar in wing pattern to *A. zina*, and the characters that distinguish it are discussed under that species. It is also closely related to *A. olynthia*, but may be distinguished by typically having a more reddish rather than yellowish brown ventral ground colour, a broader white postdiscal band on the VHW (when present), which is widest in cells M_3-M_2 and M_2-M_1, rather than tapering gradually from the costa to the tornus, and by having the silver-grey marking of the submarginal series in cell Cu_1-M_3 on the VFW a straight or mildly curved dash inclined towards the costa, instead of a distinctly U-shaped, basally pointing marking. From all other similar species it is distinguished by the entirely fused postdiscal band and postdiscal series on the VFW, and the lack of any markings of the outer submarginal series, with the result that there is only a single row of silver-grey dashes between the pale band and distal margin. The presence and shape of the postdiscal bands on both wings shows substantial geographic variation, and I recognise five subspecies.

This species is probably the sister species of *A. olynthia*, with which it shares a well developed orange subapical marking in cell M_2-M_1 (probably a plesiomorphy), and an entirely fused postdiscal band and postdiscal series (in most subspecies of *A. justina*), of which the basal edge is noticeably kinked basally at vein 2A on the VFW. It is also closely related to *A. milleri*, *A. jordani* and *A. zina*, all of which share a number of characters listed under *A. milleri*.

Range and status: Montane areas from the Venezuelan Cordillera de Mérida to northwestern Ecuador, to Bolivia. Not recorded to date from the Sierra Nevada de Santa Marta or Perijá, but likely to occur there. Uncommon to rare in premontane rain to cloud forest, from 700-2450m, several subspecies with restricted ranges. Females extremely rare.

Specimens examined: 211 (209♂, 2♀)

Adelpha justina justina (C. & R. Felder, 1861)

Figs. **114a-d**; 205a,b; *315*

Heterochroa justina C. & R. Felder (1861: 109)

TL: Cordillerae bogotanae [Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Bogotá Lindig Type//Felder Colln.//Justina n." [examined]

=*Adelpha justina praevalida* Fruhstorfer (1915: 514)

TL: Cuzco, Peru. **Types**: **BMNH**(T): **ST**♂: "justina praevalida Fruhst.// Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//TYPE//Type// Syntype" [examined]

Adelpha justina Fldr., Kirby (1871)

Identification, taxonomy and variation:

The nominate subspecies is most similar to *A. j. justinella*, from which it is distinguished by the broader, slightly paler orange DFW band, entirely lacking sparse brownish scaling in the upper portion and cell Cu_2-Cu_1, with the basal edge lying along the postcellular bar on the VFW, and by the less pronounced inner postdiscal series on the VHW, which is represented in *A. j. justinella* by diffuse, purplish grey dashes. The white spot at the VHW and DHW costa may be present or absent., while the width of the DFW band varies slightly, but it is consistently greatest in specimens from extreme southwestern Colombia and northwestern Ecuador. The latter specimens also tend to lack any white in cell Cu_1-M_3 on the DHW, though one specimen has a tiny white dot, while *A. j. justina* in all other areas has a well developed white spot in cell Cu_1-M_3, except for single males from Frontino and Manizales. Specimens intermediate in both of these slight characters occur rarely throughout the western slope of the Cordillera Occidental in Colombia, and therefore I do not recognise southwest Colombian and northwest Ecuadorian specimens as a separate subspecies. The single specimen that I have examined from Pichincha province in western Ecuador, the most southerly record for the species, is distinctive in having a very reduced orange DFW band, which is heavily incised at the veins, while the white DHW postdiscal spot is reduced to cells Cu_1-M_3 and M_3-M_2. This specimen may represent a subspecies occurring in central and southwestern Ecuador, but more specimens are needed to establish the consistency of the wing pattern differences. A single specimen in the PB, from the Lita area in far northwestern Ecuador, also has a similarly reduced white DHW postdiscal spot, but the orange DFW band is typical in shape.

Felder & Felder (1861) described this species from an unspecified number of male specimens from the Bogotá area. The description states that the outer edge of the orange DFW band is sinuate, which probably refers to the protruding distal edge in cell M_3-M_2, and their figure published shortly after (Felder & Felder, 1867: tab. LVII, fig. 10, 11) and the syntype in the BMNH confirm the identity of this taxon. Fruhstorfer (1915) described *A. justina praevalida* based on an unspecified number of specimens supposedly from Cuzco, in Peru, which reputedly differed in having a paler DFW band, smaller DFW subapical spots and a longer white DHW postdiscal marking. The syntype is a typical Colombian specimen and clearly mislabelled, and although all of the differences cited by Fruhstorfer are apparent, they represent no more than individual variation and the name was synonymised with *justina* by Hall (1938).

Range: The nominate subspecies occurs throughout the Colombian Andean cordilleras, with the exception of the eastern slope of the Cordillera Oriental, to northwestern Ecuador. It has yet to be recorded in the Cordillera Oriental north of Muzo, or in the Sierras de Perijá and Nevada de Santa Marta, although *A. j. maira* may be from the latter region.

Immature stages: Unknown; Aiello's (1984) "*A. justina*" is *A. zina zina*.

Habitat and adult ecology: This subspecies is uncommon in collections and little has been reported on its behaviour or habitats. Specimen label data indicate that it flies in Colombia from 1000-2400m, throughout the year, while in northwestern Ecuador I have found it to be locally common in September, in the early dry season, but absent in November, at a particular site on the Río Golondrinas in primary cloud forest. Males were readily attracted to rotting fish in river side traps, and elsewhere I have found males in similarly baited traps on a forested ridge top. I have also observed males on several occasions perching on open paths along ridge tops, from 3-7m above the ground, from 10.30-11.00am during bright sun. Salazar (1996) reports a similar behaviour in Colombia, where he found males hill-topping on Cerro Ingrumá. Raguso & Gloster (1996) also report this species from forest light gaps at the Reserva Maquipucuna in western Ecuador. I have seen no female specimens in any collections. This taxon is sympatric and probably involved in mimicry with *A. zina zina* and *A. leucophthalma leucophthalma*.

Specimens examined (118♂):
VENEZUELA (1♂): "*Mérida*": Mérida 1♂ MCZ-error. **COLOMBIA** (105♂): *Antioquia*: Antioquia 1♂ ZMHU; Frontino 3♂ BMNH; Mesopotamia 14♂ AMNH; Quebrada San Juan Apr. 1♂ JFL; *Boyacá*: Muzo 1♂ AME; *Caldas*: Bocatoma, Manizales 2400m Aug. 1♂ MHNUC; Manizales 3♂ BMNH, 1♂ BMB; Quebrada El Aguila, Manizales 1900m Aug. 1♂ USNM; *Chocó*: San José del Palmar Jan. 1♂ JFL; *Cundinamarca*: Bogotá 32♂ BMNH, 1♂ ZMHU, 2♂ BMB, 1♂ MCZ; env. de Bogotá 2♂ BMNH; El Baldio 5400' Sep. 5♂ BMB; Fusagasugá 3♂ BMNH; *Nariño*: El Palmar 1300m Aug. 2♂ AMNH; *Quindío*: Cerro Aguacatal May 2♂ JFL; *Risaralda*: Distrito de Pereira 3♂ BMNH; Quebrada Río Negro, Pblo. Rico 1550m Aug. 1♂ MHNUC; San Antonio de Chami 1650m Jan. 1♂ ESM; Santa Rita Valley 2♂ USNM; *Tolima*: Río Chili Apr.-Jun. 1♂ BMB; no specific locality 1♂ BMNH; *Valle del Cauca*: Cali-Buenaventura Apr. 1♂ ESM; Queremal 1200m Apr. May 1♂ KWJH, 1♂ LMC; Río Anchicayá 1000-1150m Oct. Jan. 4♂ AME; *Not located*: Cauca 1♂ BMNH; Cauca Valley 1♂ BMB; Caucathal 1♂ ZMHU; no specific locality 2♂ BMNH, 1♂ USNM, 4♂ BMB, 1♂ MNHN, 1♂ AMNH. **ECUADOR** (7♂): *Carchi*: ridge to east of Río Baboso, nr. Lita 1000m Aug. 1♂ KWJH; Santa Rosa, Río Golondrinas 1700m Sep. 5♂ KWJH; *Pichincha*: Hda. Santa Isabel 1200m Sep. 1♂ KWJH. "**PERU**" (1♂): no specific locality 1♂ BMNH-error. **COUNTRY UNKNOWN** (4♂): Ecuador-Colombia Jun. 1♂ FSCA; no specific locality 1♂ USNM, 2♂ MCZ.

Additional locality data:
COLOMBIA: *Caldas*: Cerro Ingrumá 2300m Apr. Jul. (Salazar, 1996). **ECUADOR**: *Pichincha*: Reserva Maquipucuna 1600m Oct. (Raguso & Gloster, 1996); *Imbabura*: Cachaco 1300m Jul.; Río Verde 1200-1650m Aug.; Santa Rita de Cachaco 1500m Jul. (Willmott & Hall, sight records).

Adelpha justina justinella Fruhstorfer, 1907

Figs. **114e,f**; *315*

Adelpha justina justinella Fruhstorfer (1907: 172)

TL: Venezuela. **Types**: **BMNH**(T): **HT**♂: "justina justinella Fruhst.//Illustrated in the Butterflies of Venezuela, A. Neild 1996//23// Venezuela ex coll. Fruhstorfer//Fruhstorfer Coll. B.M. 1933-131//605// TYPE//Holotype//Type" [examined]

Identification, taxonomy and variation:

This subspecies is principally distinguished from the nominate by the dark brown scaling clouding the orange DFW postdiscal band in cells Cu_2-Cu_1 and M_3-R_5, and by the basal edge of the upper postdiscal band on the VFW not being adjacent to the postcellular bar, in addition to other characters discussed under the nominate subspecies. There is variation in the extent to which the orange DFW band is clouded with brown scaling, some specimens may have the veins crossing the marking heavily lined with dark brown, and I have seen a single male in the ZMHU from Mérida which has the white DHW postdiscal marking reduced in width and present only in cells M_3-M_2 and M_2-M_1. In addition to the single male from Táchira in the AFEN, I have also examined a photograph, courtesy of Andrew Neild, of two further specimens from the same locality in the collection of Francisco de la Villa. All of these differ from typical *A. j. justinella* in not having the orange DFW band clouded with dark brown in cell Cu_2-Cu_1, and much less so in cells M_3-R_5, the band is broader in cell $2A$-Cu_2 and extends to vein 2A, and the white DHW postdiscal marking is elongated, in one specimen extending unbroken to the costa, with irregular distal and basal edges. Since these specimens show some variation, and originate from a classic blend zone between the eastern and western slopes of the Cordillera de Mérida and the northeastern slopes of the Colombian Cordillera Oriental, I do not treat them as a distinct subspecies. I regard it as highly probable that the specimens are transitional between *A. j. justinella* and *A. j. valentina*, which occurs further south, and/or possibly *A. j. justina*, which may occur in the Catatumbo region.

Fruhstorfer (1907) described this subspecies from a single male specimen in his collection collected in Venezuela, and noted the principal distinguishing characters, including the narrower, clouded orange DFW band. The holotype is in the BMNH (Fig. 114e,f).

Range: *Adelpha j. justinella* occurs on the eastern slopes of the Cordillera de Mérida and in the central valley, which opens to the western slopes, though it is otherwise unreported on the western slopes. Specimens which appear to be transitional to other *A. justina* subspecies are known from the Sierra de El Tamá.

Habitat and adult ecology: Neild (1996) reports that this subspecies occurs from 700-2450m, and, quoting Tomasz Pyrcz, states that it is not uncommon.

Specimens examined (17♂, 1♀):

VENEZUELA (17♂, 1♀): *Mérida*: Mérida 5♂ BMNH, 4♂ ZMHU, 1♂ BMB; Montan. Sierra 3000m Jul. 2♂ BMNH; *Táchira*: Mata Mula, Via Bramon a Delicias, Sierra de el Tamá 1805-2020m Sep. 1♂ AFEN; *Trujillo*: La Laguna, Boconó-Guaramacal 1750m Dec. 1♀ MUSM; *Not located*: no specific locality 3000' 1♂ BMNH, 1♂ BMB, 1♂ MNHN, 1♂ JFL.

Adelpha justina maira Orellana, 1996

Figs. **114g,h**; *315*

Adelpha justina maira Orellana (1996: 22)

TL: Venezuela. **Types**: **ZMHU**: **ST**♀: "89//Syntype ♀ Adelpha justina f. maira Fruhstorfer G. Lamas det. '87//Syntype" [examined]

=*Adelpha justina justinella* form *maira* Fruhstorfer (1915: 514) unavailable name

TL: Venezuela. **Types**: **ZMHU**: **ST**♀: "89//Syntype ♀ Adelpha justina f. maira Fruhstorfer G. Lamas det. '87//Syntype" [examined]

Identification, taxonomy and variation:

This subspecies is readily distinguished from all other subspecies of *A. justina* by the absence of any white postdiscal markings on the DHW and by the very reduced upper postdiscal band on the VFW, which is present only as indistinct brownish scaling. It is similar to *A. zina inachia*, which lacks the upper postdiscal band on the forewing and has thinner orange postdiscal markings in cells Cu_2-Cu_1 and Cu_1-M_3 on the DFW. It is associated with *A. justina* on the basis of ventral fore and hindwing characters that characterise this species, discussed under *A. zina*.

Fruhstorfer (1915) introduced the name *maira* for specimens in Staudinger's collection (now the ZMHU) and gave the country of origin as Venezuela, stating that these specimens represented a form of *A. justina justinella* that lacked white on the DHW. The name is thus a quadrinomial and therefore unavailable. Orellana (1996) subsequently used the name as a subspecies of *A. justina*, and made the name available through "bibliographic reference" (ICZN, 1999: Art. 13.1.2) to a published "description or definition that states in words characters that are purported to differentiate the taxon" (ICZN, 1999: Art. 13.1.1), i.e., Fruhstorfer's (1915) original description. Orellana therefore becomes the author of the new name *Adelpha justina maira* (ICZN, 1999: Art. 45.5.1), which adopts the type material of Fruhstorfer's *maira* (ICZN, 1999: Art. 72.4.4). There is only one specimen in the ZMHU that matches Fruhstorfer's description, a female (Fig. 114g,h), and it lacks any locality data. Possibly the data label has been subsequently lost, or, perhaps more likely, Fruhstorfer simply gave Venezuela as the locality since he believed that the specimen was a form of the Venezuelan *A. j. justinella*. In addition to the lack of the postdiscal marking on the DHW, the specimen differs from typical *A. j. justinella* in having a much thinner upper postdiscal band on the VFW, the inner postdiscal series on the VHW is scarcely visible and there is no dark brown scaling in the orange postdiscal band in cell Cu_2-Cu_1 on the DFW. These differences suggest that it is not a form of *A. j. justinella*, but its true range can only be guessed at. Neild (1996) doubted that it really came from Venezuela as indicated by Fruhstorfer (1915), but suggested that it if it did, it might possibly fly in the Cordillera de la Costa in northern Venezuela. I agree with Neild (1996) that, given the very similar dorsal wing pattern to *A. z. inachia*, it may well represent the subspecies from the Sierra Nevada de Santa Marta in Colombia, where no *A. justina* have been recorded to date.

Range: The range of this subspecies is currently unknown, but the Sierra Nevada de Santa Marta in northern Colombia is perhaps most likely.

Habitat and adult ecology: Nothing is known of the biology of this evidently very rare taxon.

Specimens examined (1♀):

COUNTRY UNKNOWN (1♀): no specific locality 1♀ ZMHU.

Adelpha justina inesae Orellana, 1996

Figs. **114i,j**; *315*

Adelpha justina inesae Orellana (1996: 22, figs. 1, 2)

TL: km 10 vía Sanare-Caspo, Lara, Venezuela. **Types** (all Venezuela): **MIZA**: **HT**♂: km 10 vía Sanare-Caspo, 1700m, 31 Mar. 1991, *leg.* A. Orellana [photograph examined]; **MALUZ**: **AT**♀: 5 km S.W. de Machiques, Tucuco, Perijá, Zulia, 5 Mar. 1980, *leg.* E. Inciarte M.; **BMNH**: **PT**♂: Cubiro, Sector La Florida, Parque Nacional Yacambú, Lara, 1820m, 8 Dec. 1991, *leg.* A. Orellana; **MZUJ**: **PT**♀: same data as HT [not examined]

Identification, taxonomy and variation:

This subspecies is easily distinguished from all other *Adelpha* by the entirely brown DFW and oval white postdiscal marking on the DHW.

Orellana (1996) described *A. j. inesae* from four specimens and clearly figured both surfaces of the holotype male (Fig. 114i,j). This subspecies is a remarkable discovery and indicates the strong possibility of the existence of undescribed taxa in other unexplored montane areas in northern Venezuela and Colombia.

Range: Three of the four type specimens, including the holotype, come from a restricted area in the Sierra de Portuguesa in the state of Lara, at the northwestern tip of the Cordillera de Mérida in northwestern Venezuela. The fourth specimen was reputedly collected in Zulia state, in the Sierra de Perijá, but this specimen is almost certainly mislabelled. The collection locality lies at 400-500m, which is certainly below the altitudinal range of this species, and *A. j. justinella* occurs in the intervening western slopes of the Cordillera de Mérida, implying that the range of the subspecies would be disjunct. Furthermore, there are other examples of probably mislabelled specimens from the same locality, including, for example, *A. seriphia pione*.

Habitat and adult ecology: This distinctive subspecies is known from premontane forest from 1600-2000m, where it is sympatric with the newly described *A. zina desousae*, which it resembles in having an entirely brown DFW. Possibly this resemblance is due to mimicry between the two species. Orellana (1996) reports that it occurs on the edges of clearings, and that individuals typically rest high above the ground, out of reach of the collector.

Specimens examined (1♂):

VENEZUELA (1♂): *Lara*: km 10 vía Sanare-Caspo, 1700m Mar. 1♂ MIZA(photograph).

Additional locality data: **VENEZUELA**: see type data above (Orellana, 1996).

Adelpha justina valentina Fruhstorfer, 1915 **stat. nov.**

Figs. **114k,l**; 205c; *315*

Adelpha valentina Fruhstorfer (1915: 514)

TL: Río Negro [Colombia]. **OTL**: "Río Negro [Colombia] and along the

Andes from Colombia to Bolivia”. **Types**: **BMNH**(T): **LT**♂: “valentina Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Río Negro Fruhstorfer//TYPE//Type//Syntype” [examined]

Identification, taxonomy and variation:

This subspecies is distinguished from all of the remainder by the vertical orange DFW band which extends to the anal margin and by the straight basal edge to the white VHW postdiscal band, which is not incised at the veins. *Adelpha j. valentina* is very similar to *A. olynthia*, but may be distinguished by the white DHW postdiscal band being broadest in cells M_3-M_2 and M_2-M_1 and then sharply tapering towards the tornus, instead of being even in width in the anterior half of the wing, and by the shape of the silver-grey marking of the submarginal series in cell Cu_1-M_3 on the VFW, which is a straight or mildly curved dash inclined towards the costa, instead of a distinctly “U”-shaped, basally-pointing marking. In and to the north of Ecuador the orange DFW band is typically much broader than in *A. olynthia*, and the ventral surface ground colour is always reddish brown, whereas in *A. olynthia* it is often a yellowish brown. *Adelpha j. valentina* is also similar to a number of other species, but may be distinguished by the black veins dissecting the orange upper postdiscal band on the DFW, the entirely reddish brown ventral ground colour, the absence of the outer submarginal series on the ventral surface, and the entirely fused postdiscal band and postdiscal series in cells 2A-Cu_2, Cu_2-Cu_1 and Cu_1-M_3 on the VFW. There is very slight variation in the width of the white DHW postdiscal band and the extent to which the orange DFW band is constricted at vein M_3.

Fruhstorfer (1915) described this taxon as a distinct species, based on a number of specimens from throughout the eastern Andes, the first named and only precise locality being Río Negro. The description appears immediately after his treatment of *A. olynthia*, presumably since he regarded this as the most similar species, and he merely stated that the species was distinguished by the “conspicuous and progressive extent” of the dorsal postdiscal bands, the prominent upper DFW postdiscal band and an intensely reddish brown ventral surface. All of these characters typically distinguish *A. j. valentina* from *A. olynthia*, but Fruhstorfer went on to say that the valve of the male genitalia was set with sharp spines, with a much broader and shorter clunicula than in *A. olynthia*, neither of which applies to *A. j. valentina*, in which the male genitalia is indistinguishable from *A. olynthia*. The only labelled syntype in the BMNH, from Río Negro, is consistent with the description of the wing pattern and subsequent usage of the name (Hall, 1938; D’Abrera, 1987), and I therefore designate it as the lectotype of *Adelpha valentina*. The lectotype specimen bears the following data: “valentina Fruhst.//Fruhstorfer Coll. B.M. 1937-285//Río Negro Fruhstorfer//TYPE//Type//Syntype”. I am unable to say to which species the genitalia referred to by Fruhstorfer belong. Three male specimens from Fruhstorfer’s collection in the BMNH(T), all of this subspecies, from Ecuador, Pozuzo (Peru) and Bolivia, are probable paralectotypes of *valentina*, but they bear the labels “ophidusa”, “ozolis” and “thyrea”, respectively. These three names were manuscript names published as *nomina nuda* by Martín *et al.* ([1923]).

This taxon has previously been treated as a distinct species, but since there are no significant differences in ventral wing pattern or male genitalia between it and other subspecies of *A. justina*, and all of these taxa are closely allopatric in similar habitats, I place it as a subspecies of *A. justina* (**stat. nov.**). The only wing pattern differences between *valentina* and remaining *justina* subspecies are the more complete white DHW postdiscal band and the thicker, more basally positioned pale postdiscal marking in cell 2A-Cu_2 on the VFW in *A. j. valentina*, both of which are infraspecific differences occurring in related species such as *A. jordani* and *A. zina*. Furthermore, specimens of *A. justina* from the Sierra de El Tamá on the Venezuela-Colombia border, on the eastern slopes of the Cordillera Oriental, have elongated white DHW postdiscal bands, probably showing intergradation between *A. j. justinella* and *A. j. valentina*. The characters that place *A. j. valentina* with other taxa of *A. justina*, and that define the species, are discussed in the species account.

Range: East Andean slopes, from the Cordillera Oriental in Colombia to Bolivia.

Habitat and adult ecology: *Adelpha j. valentina* has been recorded from as low as 600m at the base of the Andes, to as high as 1900m, though typically, and in the northern half of its range, it occurs from 1200-1900m. Despite the relatively few specimens in collections, I have found it to be widespread and not uncommon in a variety of premontane rain to cloud forest habitats, usually along rivers where it is most abundant, but also along ridge tops. It occurs both in primary forest and in areas with secondary growth, and males are readily attracted to traps in forest light gaps or along forest edges, particularly at rivers, baited with rotting fish, dung, and occasionally rotting banana. I have also observed males perching in clearings on hill tops on bushes 2-3m high. I have seen no female specimens in any collections. The dorsal wing pattern of *A. j. valentina* is very similar to that of the sympatric species *A. olynthia*, which is always more abundant, and *A. argentea*, with which the subspecies is probably involved in mimicry.

Specimens examined (73♂):

COLOMBIA (7♂): “*Antioquia*”: Antioquia 2♂ ZMHU-error; *Cundinamarca*: Bogotá 1♂ USNM; *Meta*: Manzanares 1800m Mar. 1♂ ESM; Río Negro 1♂ BMNH; *Nariño*: “Ricaurte 1200m” Sep. 1♂ ESM-error; *Not located*: no specific locality 1♂ ZMHU. **ECUADOR** (36♂): *Morona-Santiago*: Coangos 15-1600m Jul. 1♂ MUSM; *Napo*: “Chichicorrumi” Oct. 1♂ MJP-error; Río Hollín Sep. Oct. 3♂ MJP, 4♂ DAT; Tena-Loreto rd., km 49, 1350m Mar. Oct. 3♂ KWJH; *Pastaza*: Alpayacu 3600' 1♂ BMNH; *Tungurahua*: env. de Ambato 1♂ BMNH; Río Machay 1700m Feb. 1♂ KWJH; Topo 1250m Jul. Oct. 1♂ KWJH, 1♂ AME; *Not located*: Oriente 15♂ AMNH; no specific locality 4♂ BMNH. **PERU** (19♂): *Junín*: Chanchamayo 3-4000' Nov. Dec. 4♂ BMNH, 2♂ ZMHU, 2♂ BMB, 2♂ USNM; Río Perené 1♂ MUSM; Satipo May 1♂ AME; *Pasco*: Alto Yurinaqui 1000m May 1♂ MUSM; *Puno*: Inca Mines Sep. 1♂ AMNH; *Not located*: Río Huallaga 1♂ AMNH; no specific locality 3♂ BMB, 1♂ MCZ. **BOLIVIA** (11♂): *Cochabamba*: Cristal, Chaparé 600m May 2♂ MUSM; El Palmar 1600m Feb. Apr. 2♂ AME; 5 days N. Cochabamba 1♂ MCZ; Yungas del Esp. Santo 1♂ BMNH; *La Paz*: Río Songo 1200m 3♂ ZMHU, 1♂ MCZ; San Antonio 1800m 1♂ ZMHU. *Not located*: no specific locality 1♂ BMNH.

Additional locality data: **ECUADOR**: *Morona-Santiago*: Río Abanico 1600m Oct.-Dec.; *Napo*: Tena-Loreto rd., km 49, Aug.; *Sucumbíos*: La Bonita-Rosa Florida rd., km 15, Mar.; Quebrada El Copal 1200m Nov.; Río Palmar 1200m Nov.; Río Sucio 1800m Nov.; *Tungurahua*: Chinchin 1800m Nov.; Río Machay 1900m Apr. Aug. Nov. (Willmott & Hall, sight records).

Adelpha olynthia (C. & R. Felder, 1867)

Figs. **115a-d**; 206a,b; *316*

Heterochroa olynthia C. & R. Felder (1867: 424, Tab. LVII, fig. 8)

TL: Bogotá, Nova Granada [Colombia]. **Types**: **BMNH**(R): **ST**♂: “Syntype//Bogotá Lindig Type//Felder Colln.//Olynthia n.//olynthia” [examined]

=*Adelpha olynthia olynthina* Fruhstorfer (1907: 172) **syn. nov.**

TL: Ecuador. **Types**: **BMNH**(T): **ST**♂: “olynthia olynthina Fruhst.// Fruhstorfer Coll. B.M. 1933-131//Ecuador Fruhstorfer//TYPE//Type// Syntype” [examined]

=*Adelpha levicula* Fruhstorfer (1913: pl. 106a; 1915: 514) **syn. nov.**

TL: [Pichinde, Colombia]. **Types**: **BMNH**(R): **ST**♂: "Syntype//Type//TYPE//R//Pichinde, Colombia. XI '91 5000' W. Rosenberg//olynthia levicula Fruhst." [examined]

=*Adelpha olynthia olynthina* Fruhstorfer (1915: 514) **preocc.** Fruhstorfer (1907), **syn. nov.**

=*Adelpha olynthia theaena* Fruhstorfer (1915: 514) **syn. nov.**

TL: Cuzco, Peru. **Types**: **BMNH**(T): **ST**♂: "olynthia theaena Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Peru H. Fruhstorfer//TYPE//Type//Syntype"; **BMNH**(M): **ST**?♂: "Fruhstorfer Coll. B.M. 1937-285//Peru H. Fruhstorfer//TYPE" [both examined]

=*Adelpha olynthia zopyra* Fruhstorfer (1915: 514) **stat. nov.**

TL: Chanchamayo; near Cushi, Huánuco, Peru. **Types**: **BMNH**(T): **ST**♂: "olynthia zopyra Fruhst.//Fruhstorfer Coll. B.M. 1933-131//Peru H. Fruhstorfer//TYPE//Type//Syntype" [examined]; **BMNH**(M): **ST**♂: "Chanchamayo VI.-VIII. 01 (Hofmann)//Paratype//Joicey Bequest Brit. Mus. 1934.-120"; **BMNH**(R): **ST**♂: "Syntype//Cushi, Prov. Huánuco, Peru 1900m (W. Hoffmanns)//olynthia olynthina Fruhst.//zopyra Fruhst." [all examined]

Adelpha olynthia Fldr., Kirby (1871)

Identification, taxonomy and variation:

Adelpha olynthia is most similar to *A. justina valentina*, from which it may be distinguished by the shape of the white hindwing postdiscal band, which is typically narrower and of almost even width throughout and tapers towards the tornus, instead of being broadest in cells M_3-M_2 and M_2-M_1, by the typically narrower orange DFW band, and by the silver-grey submarginal marking in cell Cu_1-M_3 on the VFW being U-shaped instead of a straight dash inclined towards the costa. The ventral ground colour of *A. olynthia* is also typically more yellowish than reddish brown. The very narrow white DHW postdiscal band, the entirely fused postdiscal band and postdiscal series on the VFW and the absence of the outer submarginal series on both wings distinguish *A. olynthia* from other similar species. There is some geographic variation in wing pattern. The orange DFW band is thinnest in Colombia and western Ecuador, becoming gradually thicker to the south, with the upper postdiscal series, which is often absent in northern specimens, becoming more pronounced (Fig. 115a,c). Both the ground colour of the dorsal surface and the colour of the DFW band tends to be paler in western Ecuadorian specimens. The colour of the ventral surface varies from a faded, yellowish brown to a rich reddish brown, similar to *A. justina*, and the silvery submarginal series may be sharply defined or indistinct, almost merging with the ground colour. The white DHW postdiscal band is also variable in width, being narrowest in western Ecuador and Colombia, where it may not enter cell 2A-Cu_2, and becoming broader to the south.

Felder & Felder (1867) described this species based on an unspecified number of male specimens collected by Lindig in Bogotá, and the accurate figure of the dorsal surface and syntype in the BMNH leave no doubt as to its identity. The syntype lacks any trace of the DFW upper postdiscal series, and has a narrow orange DFW postdiscal band typical of specimens from the western slopes of the Cordillera Oriental, just north of Bogotá, and the Manizales area. Fruhstorfer (1907) described *olynthina* from two males ex coll. Oberthür in his collection from Ecuador, stating that the orange DFW band was broader, the hindwing band narrower and the ventral surface more ochre yellow. A syntype in the BMNH, typical of east Andean specimens, corresponds to this description. Several years later, Fruhstorfer (1915) redescribed the name *olynthina*, which is therefore both a synonym and a junior homonym of *olynthina* Fruhstorfer, 1907. Fruhstorfer (1913) introduced the name *levicula*, later placing it as a subspecies of *A. olynthia* (Fruhstorfer, 1915), for a single specimen in the Tring Museum (now the BMNH(R)) collected at Pichinde, Colombia, at 5000' (Fruhstorfer, 1915). The ventral surface was figured (Fruhstorfer, 1913). Fruhstorfer stated that it differed from typical *A. olynthia* in having a broader and paler orange DFW band, yellowish postdiscal spots in cells M_2-M_1 and M_1-R_5 on the DFW and a more reddish ventral surface. These differences are apparent in the unique syntype, with the exception of the ventral colour, which does not differ from the nominate, and the specimen is typical of those from the Cauca valley in the vicinity of Cali. Fruhstorfer (1915) described *A. olynthia theaena* from a number of specimens from Cuzco in Peru, and figured it (Fruhstorfer, 1913) on plate 106a as *olynthia*. The syntype specimens match the description and illustration and are typical of southern Peruvian specimens in having heavier orange DFW postdiscal spots in cells M_2-M_1 and M_1-R_5, a broader orange DFW band and a broader white DHW postdiscal band. The syntypes of *A. olynthia zopyra*, also described by Fruhstorfer (1915), based on specimens from Chanchamayo and Cushi in Peru, are similar to the syntypes of *theaena* except for reduced orange postdiscal markings in cells M_1-R_5 and M_2-M_1 on the DFW, thus being intermediate to east Ecuadorian specimens. All of the above proposed subspecific names, with the exception of *zopyra*, which was synonymised by Hall (1938) with *olythina*, have been retained as distinct subspecies by previous authors. Although the names typically refer to consistent local phenotypes, after examining a long series of this species from many geographically intermediate localities I conclude that the variation lacks discrete gaps, being smoothly clinal, and does not merit taxonomic recognition. I therefore synonymise *olynthina*, *levicula*, *theaena* and *zopyra* with *olynthia* (**syn. et stat. nov.**).

Adelpha olynthia appears to be the sister species of *A. justina*, and the characters shared by these two species are discussed under the latter.

Range: *Adelpha olynthia* occurs throughout Colombia in montane areas (with the exception of the Cordillera Oriental north of Boyacá, the Sierras de Perijá and Nevada de Santa Marta), to northwestern Ecuador, and along the eastern Andes to northern Bolivia. Western Ecuadorian specimens from the provinces of Cotopaxi and Bolívar are probably mislabelled; certainly this is true of the specimen from Angamarca in the BMNH, but since the other specimens were examined before I had personally collected *A. olynthia* in northwestern Ecuador, I was unaware of the distinct wing patterns of eastern and western specimens. The species probably also occurs in the Sierra de El Tamá in Venezuela.

Habitat and adult ecology: Except in Bolivia, where the species appears to be uncommon to rare, *A. olynthia* is common throughout its range, and can be locally very abundant. It has been reliably recorded from 1050-2700, where it occurs in cloud forest habitats, along rivers, hillsides and ridge tops. Males are observed most frequently along rivers and dirt roads through forest, where they congregate in numbers at water seepage over rocks and at sand banks along river sides, particularly if these areas are enriched through the addition of urine. Up to 30 males may be found in a single trap baited with rotting fish along a river side, within a period of less than an hour. Salazar (1996) reported males hill topping on Cerro Ingrumá in Colombia. Females are very rare both in collections and in the field. The species flies throughout the year.

Specimens examined: 368 (365♂, 3♀)

COLOMBIA (194♂, 2♀): *Antioquia*: Antioquia 1♂ BMB; Frontino 4♂ BMNH; Mesopotamia 1♂ AMNH; *Boyacá*: Parque Iquaque 2700m Apr. 1♂

ESM; *Caldas*: Bocatoma, Manizales 2400m Apr. 1♀ MHNUC; Cerro del Ingrumá 2050m Jul. Oct. 1♂ KWJH, 1♀ MHNUC; Manizales Jan. Feb. Mar. May Sep. 5♂ BMNH, 4♂ MUSM, 3♂ USNM, 1♂ JFL; Purnio 280m Sep. 1♂ BMNH; Río Sucio Sep. 1♂ USNM; *Caquetá*: Caquetá Jun. 2♂ JFL; *Chocó*: San José del Palmar 1800m Jun. 1♂ ESM; *Cundinamarca*: Bogotá 57♂ BMNH, 9♂ USNM, 1♂ ZMHU, 2♂ BMB, 1♂ MNHN, 1♂ MCZ; env. de Bogotá 3♂ BMNH; El Baldio 5400' Sep. 5♂ BMB; Fusagasugá 2♂ BMNH; La Vega 1900m Jan. 1♂ BMNH; Pacho 1♂ BMNH; *Huila*: Neiva 2200m Jun. 1♂ JFL; *Meta*: U. Río Negro 800m 1♂ BMNH; San Martín, Llanos of Río Meta 1♂ BMNH, 2♂ BMB; *Nariño*: La Planada Aug. 1♂ ESM; *Risaralda*: Distrito de Pereira 1♂ BMNH, 1♂ BMB; *Tolima*: Aguadita 1♂ BMNH; Río Chili Apr.-Jun. 5♂ BMB; Río San Fernando 2000m Jun. 1♂ AME; no specific locality 1♂ BMNH; *Valle del Cauca*: San Antonio km 14 2000m Jun. Aug. 2♂ LMC; Felidia, Cali Mar. 2♂ ESM; Peñas Blancas, Pichinde 1800m Aug. 1♂ LMC; Pichinde 5000' Nov. Dec. 2♂ BMNH; Río Aguacatal 2000m 1♂ BMNH, 1♂ MCZ; Río Cali 1900m Jan. 1♂ AME; *Not located*: Bought at Villavicencio 2♂ BMNH; Interior 2♂ BMB; Magdalena V. May-Aug. 1♂ BMB; no specific locality 46♂ AMNH, 7♂ BMB, 1♂ MNHN. **ECUADOR** (91♂): "*Bolívar*": Balsapamba 1♂ BMB-error?; *Carchi*: Santa Rosa, Río Golondrinas 1700m Sep. 4♂ KWJH; "*Cotopaxi*": Angamarca 1♂ BMNH-error, 2♂ BMB-presumably error; *Morona-Santiago*: La Esperanza 1900m May 2♂ USNM; Río Abanico Nov. 3♂ DAT; *Napo*: Río Chonta 2000m Oct. 1♂ KWJH; *Pastaza*: "Sarayacu" 4♂ BMNH-error; *Tungurahua*: env. de Ambato 18♂ BMNH, 3♂ BMB; Baños 5-7000' 5♂ BMNH, 1♂ USNM; El Rosario 4900' 1♂ BMNH, 1♂ BMB; Río Blanco Apr. Jun. 2♂ ZMHU, 7♂ AME; Río Chinchin Grande 1400m Oct. Dec. 10♂ AME; Río Machay 1700m Feb. Jul. 4♂ KWJH; Río Verde 5000' 1♂ BMB; Topo 4200' Jan. 3♂ BMB; *Zamora-Chinchipe*: Quebrada Chorillos 1250m Nov. 1♂ DAT; N. of Valladolid 2000m May 1♂ KWJH; Zamora 1♂ BMNH; *Not located*: Oriente 5♂ AMNH; no specific locality 7♂ AMNH, 1♂ BMNH, 1♂ USNM. **PERU** (56♂): *Amazonas*: Alfonso Ugarte 1600-1750m Jul. 1♂ MUSM; Chachapoyas 1♂ BMNH; *Cuzco*: Buenos Aires 2-2300m Dec. 2♂ MUSM; Buenos Aires, 20-28 km E., 12-1500m Dec. 2♂ MUSM; Consuelo, Cosñipata 1200m Sep. 1♂ MUSM; Quebrada Quitacalzón 1050m May 2♂ MUSM; Santa Isabel, Cosñipata 12-1500m Feb. 1♂ MUSM; *Huánuco*: Cushi 1900m 1♂ BMNH; Tingo María May 1♂ AME; *Junín*: Chanchamayo Jun.-Aug. 9♂ BMNH, 1♂ MUSM; El Porvenir 900m 1♂ BMB; Hda. Naranjal, 7 km E. Mina Pichita 1550-1650m Oct. Nov. 2♂ MUSM; La Merced Aug. Sep. 2♂ BMNH; Río Perené 1♂ BMB, 1♂ MUSM; *Pasco*: Huancabamba 3100' Jan. 2♂ BMNH, 1♂ BMB; Río Palcazu 2♂ BMNH; *Puno*: Sto. Domingo Jul. Aug. 2♂ BMNH; *Not located*: Río Huallaga Dec. 2♂ AMNH; no specific locality 12♂ BMNH, 3♂ BMB, 2♂ USNM, 1♂ MCZ. **BOLIVIA** (2♂): *Cochabamba*: Palmar, Alto Chaparé 1100m 1♂ MUSM; *La Paz*: Caranavi 1200m Feb. 1♂ MUSM. "**BRAZIL**" (2♂): no specific locality 2♂ BMB-error. **COUNTRY UNKNOWN** (20♂, 1♀): U. Amazon 1♂ BMNH; no specific locality 9♂ MCZ, 2♂, 1♀ BMNH, 4♂ AMNH, 3♂ BMB, 1♂ MNHN.

Additional locality data: **COLOMBIA**: *Caldas*: Cerro Ingrumá 2300m Sep. (Salazar, 1996); *Not located*: Parque de Ucumarí (Andrade, 1994). **ECUADOR**: *Carchi*: El Corazón 2700m Sep.; Las Juntas 1450m Nov.; Nariz del Diablo Nov.; Santa Rosa Nov.; *Morona-Santiago*: Río Abanico 1600m Oct. Dec.; *Sucumbíos*: La Bonita-Rosa Florida rd., km 12, 2000m Mar.; Río Palmar 1200m Nov.; Río Sucio Nov.; *Tungurahua*: Chinchin 1800m Nov.; Río Machay Apr. Aug. Nov.; *Zamora-Chinchipe*: Quebrada Chorillos 1250m Nov.; Quebrada Las Dantas 1700m Oct.; Quebrada San Ramón 1700m Oct. (Willmott & Hall, sight records).

Adelpha levona Steinhauser & Miller, 1977

Figs. **116a,b**; 207a,b; *316*

Adelpha levona Steinhauser & Miller (1977: 1, figs. 1, 2, 5)

TL: Río Anchicayá, Valle del Cauca, Colombia. **Types**: **AME**: **HT**♂: Río Anchicayá, 1000m 2. ii. 1975 *leg.* S. & L. Steinhauser; 8**PT**♂: Río Anchicayá 1000-1150m Jan. Feb. Oct. Dec.; 2**PT**♂: Calima Dam Nov. [all examined]; **Collection**?: **PT**♂: Río Anchicayá [not examined]

Identification, taxonomy and variation:

Adelpha levona is most similar in dorsal wing pattern to *A. rothschildi*, and its identification is discussed under that species. It is also very similar on the dorsal surface to *A. salus emmeli*, but may be distinguished by the pale postdiscal markings on the VFW in cell Cu_1-M_3 not being split by a dark brown line, and by the pale greyish inner postdiscal series on the VHW tapering slightly at the costa, instead of being most pronounced there in cells M_1-Rs and Rs-Sc+R_1. *Adelpha zina inachia* and *A. justina maira* are also superficially similar, but easily distinguished by the lack of a continuous, pale greyish postdiscal band and postdiscal series on the VHW. The single female that I have examined has slightly heavier orange on the DFW and very slight orange scaling on the DFW at the anterior half of the discocellulars and between the first and second discal cell bars. The ground colour of the ventral surface varies individually from orange-brown to a reddish brown similar to that of *A. rothschildi*.

Steinhauser & Miller (1977) described this species in comparison with *A. rothschildi*, and clearly figured both wing surfaces and the male genitalia. I have examined the holotype (Fig. 116a,b) and ten paratype specimens. Despite the very close superficial similarity to *A. rothschildi*, I believe that the two species may be relatively unrelated. Notable characters in *A. levona* that differ in *A. rothschildi* include the distally displaced orange DFW subapical spot in cell M_2-M_1, compared with that in cell M_3-M_2, the presence of the upper postdiscal band in cell M_3-M_2 on the DFW (the spots of the upper postdiscal band in cells M_2-M_1 and M_1-R_5 are thus contiguous with the basal edge of the orange marking in cell M_3-M_2), the widely spaced first and second discal cell bars on the VFW, the even greyish dashes of the inner submarginal series on the VFW, the broad, indistinct brown basal streak in the VFW discal cell, the extension of the postcellular bar on the VHW into cell M_2-M_1 and the more closely spaced VHW postdiscal and submarginal series. The clunicula in the male genitalia is also more posteriorly positioned in *A. levona* than *A. rothschildi*. The male genitalia, fused postdiscal band and postdiscal series on the VFW, the characters of the VFW and VHW discal cell and positioning of the orange DFW subapical spot in cell M_2-M_1 are similar to *A. olynthia*, but the straight basal edge of the VFW postdiscal band and approximately straight inner submarginal series on both wings are not. Given the highly modified wing pattern and the fact that I have been unable to examine the female genitalia, the relationships of *A. levona* must remain unresolved.

Range: This species is known only from the western slope of the Cordillera Occidental in Colombia, from Risaralda province in the north, to northwestern Ecuador, the Chocó centre of endemism. I regard the single record from a site that appears to be in northeastern Venezuela as a mislabelling.

Habitat and adult ecology: This remarkable, recently described species occurs only in premontane rain and cloud forest, where it has been recorded from 750-1700m, though it is typically encountered in a narrower altitudinal range from 900-1500m. It is rare in collections, but locally may be common, as indicated by the quite extensive type series from the Río Anchicayá. Steinhauser & Miller (1977) report that, in western Colombia, the species has been observed flying in remnant patches of rain forest in an area largely cleared for agriculture, where males visit water seepage over rocks and concrete faces and are attracted to human and animal urine. Males may also be seen basking in sun on bare rock and gravel surfaces. In Colombia, the species has been recorded from August to February, but in Ecuador I have found it to be present only in July and August, at the end of the wet season. Abundance seems to fluctuate seasonally, and the species may be locally common, being readily attracted to traps in forest light gaps baited with rotting fish, during periods of sun from 9.30am to midday. I also once observed a single male perching at 10.30am on an open ridge top path from 4-5m above the ground, with the wings open. Raguso & Gloster (1996) also report a species as "*A. rothschildi*" from Reserva Maquipucuna, in Pichincha Province, western Ecuador, which may in fact be *A. levona*. Their behavioural comments are summarised under *A. rothschildi*. The great similarity between adult dorsal wing patterns and habitats, and the closely corresponding known ranges of this species and *A. rothschildi*, *A. lamasi* and probably *A. salus emmeli*, suggest that these species may be involved in mimicry.

Specimens examined: 26 (25♂, 1♀)

"**VENEZUELA**" (1♂): *Sucre*?: Palo Alto Río Tigre Oct. 1♂ USNM-error. **COLOMBIA** (20♂, 1♀): *Boyacá*: "Otanche" 1♂ JFL-error?; *Risaralda*: Quebrada Sutu, entre Mampay & San Antonio 1650m Jan. 1♂ MHNUC; San Antonio de Chami 1700m Jan. 1♂ ESM; Tapartó, Pblo. Rico 750m Oct. 1♀ MHNUC; *Valle del Cauca*: Calima Dam Nov. 2♂ AME; El Engaño 1000m Aug. 1♂ LMC; bet. Queremal & Buenavista Feb. 3♂ AMNH; Queremal Jul. 1♂ LMC; Río Anchicayá 1000-1150m Jan. Feb. Oct. Dec. 9♂ AME; Valle 1♂ JFL. **ECUADOR** (4♂): *Carchi*: Lita, ridge east of Río Baboso 900m Jul. Aug. 4♂ KWJH.

Additional locality data: **ECUADOR**: *Esmeraldas*: Río Chuchuví 800m Jul.; *Imbabura*: Santa Rita de Cachaco 1500m Aug. (Willmott & Hall, sight records).