BUTTERFLIES OF MICRONESIA

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About the Plates

Specimens were photographed by Donald Nafus at the University of Guam, the B. P. Bishop Museum, the Palau Entomology Laboratory, and from specimens lent by the Kyushu Entomology Laboratory. The photographs were digitized and edited on the computer to make standardized mountings, replace missing pieces and to correct colors.

Front cover: *Hypolimnas anomala* females guarding their eggs. Right most butterfly has tattered wings from beating off ants.

Butterflies are among the most showy of insects and are widely appreciated by many people who do not otherwise care for insects. Their bright colors, interesting behaviors, and daytime activity periods make them easy for everyone to enjoy.

Although in many tropical countries there are hundreds of species, in Micronesia, the butterfly fauna is small. This is because of the remoteness and small size of our islands. Most of the Micronesian butterflies have reached the islands using their own powers of flight, rather than being transported by man. Many of the butterflies that did establish are species known to be migrants able to fly long distances. The migratory propensity of these species is reflected in their common names: vagrant, common migrant, lemon migrant, mottled emigrant and wanderer. If the migrating butterflies get caught up in a storm or strong winds, they can get carried off course and out to sea. Not all of our butterflies have moved in this way. Several species on Guam, including two skippers and the black citrus swallowtail are recent introductions, and most likely arrived via aircraft on plant material or as a hitchhiker in an aircraft hold.

In part, our Micronesian butterflies make up for the lack of diversity by being very abundant. All of the major islands in Micronesia, and most of the atolls, have at least some species of butterflies and several of the species occur in vast abundance. On Guam the blue-spotted king crow can be found in great flocks at certain times of the year. Certain roosting or flowering trees may be covered with dozens, hundreds, or even thousands of butterflies.

About Butterflies

What is a butterfly?

Butterflies are members of the group of insects that we call Lepi-doptera, which is a Greek word meaning scaly wings. In the Lepi-doptera the adult form is characterized by having two pairs of wings with scales on them. The scales are attached to the wing, but may be easily rubbed off when the butterflies are handled, leaving a clear membrane which looks like a thin sheet of transparent plastic with veins running through it. These scales are responsible for the color of the wings.

In addition to the butterflies, the skippers and moths are included in the Lepidoptera. Moths tend to be heavy bodied, rather than slender like the butterflies, and have long threadlike structures on their heads that we call antenna. Butterflies antennae differ from those of moths, by having a pronounced club on the end and resembling a match stick. Butterflies usually have slender bodies. Skippers look much like a cross between butterflies and moths. They have heavy bodies like a moth, yet also have a clubbed antennae like a butterfly. The club differs from that of the butterfly, looking more like a hook than a match head. Moths tend to fly at dusk or night, while butterflies and skippers are usually day fliers, although a few species fly mostly at dawn or dusk.

How do butterflies grow and change?

Insects belong to a large group of animals called Arthropods that have skeletons on the outside of their body. Some other common members of this group in our area are spiders, mites, ticks, crabs, lobsters, shrimp, scorpions, centipedes and millipedes. All these animals have a segmented outer skeleton. The segments are connected by membranes so that the animals can move. This rigid outer skeleton can only expand a small amount. In order for the animal to grow, it has to shed its skin, a process we call molting. Before it molts, a new skin grows

underneath the old one. When the right time comes, the old skin splits and the animal crawls out, with its new skin all soft and wrinkled. Then the insect blows itself up with air, thereby stretching and enlarging the new skin. Within a couple of hours after molting, the new skin hardens and the insect is ready to resume its activities.

Not only do the immature stages grow by molting, but during its life the butterfly undergoes a series of transformations in which it has radically different forms. It starts life as an egg, which is usually attached to the host plant. The egg hatches into a wormlike stage, called the caterpillar. This is the growth stage of the butterfly. The caterpillar feeds and grows, molting five to seven times, and storing large amounts of nutrients and fat for energy. When its growth is complete, the caterpillar is ready to change to an adult form. To do this, it transforms into a reorganization stage called a pupa (in butterflies the pupa is called a chrysalis). The outer skin becomes a hard shell-like covering. The pupa is incapable of motion, other than wiggling, and seems to be an immobile resting stage. Inside, however, the pupa is a hotbed of activity as the body undergoes a complete reorganization from an eating machine to a winged adult whose primary function is reproduction and dispersal of eggs. The body parts of the caterpillar disintegrate and new body parts grow. Wings, sex organs, long walking legs, and the long proboscis, which the adult butterfly will use to obtain nectar and other fluids, all develop. When the butterfly is ready to emerge, the chrysalis splits and the butterfly climbs out. At first its wings are crumpled, but after climbing on a twig or other support where it can hang the wings downward, it pumps the wings full of fluid from its body. The wings expand into the form we usually see, and the butterfly holds them outstretched until they harden. Then it is ready to fly off and begin its adult life.

We call the stage changes the butterfly goes through metamorphosis, a Greek word that means change.

The caterpillar, an eating machine.

Many people believe that the butterfly is the perfect form of the insect and the caterpillar is often overlooked. But both are part and parcel of each other. The caterpillar is the energy and material gathering stage. Large quantities of energy and nutrients are required to transform a caterpillar into a butterfly, and all of food must be collected in the caterpillar stage since the pupa is non-feeding. This is why full-size caterpillars are larger than the body of the butterfly they are going to turn into. In addition, the caterpillar often provides much of the energy and materials for egg production by the adult butterfly.

Most caterpillars have rather restricted diets. Almost all species feed on plants. Part of the reason that caterpillars are choosy about what they eat, relates to the chemistry of the plants they eat. Plants defend themselves against being eaten by containing a wide variety of chemicals that are at least moderately toxic to animal life. These are often the chemicals that give plants their characteristic odor or taste, such as the oils in citrus or the sharp-tasting substances in onions. Because caterpillars are relatively immobile and must eat large quantities of material in relation to their body size, they normally specialize on their food types. Their guts are very good at detoxifying the particular set of chemicals associated with their host, and they only feed on plants that contain these chemicals. In fact, most are so specialized that they cannot recognize any other plant as food unless it has the appropriate chemicals in it, which is just as well since most other plants will poison them if they do try to eat them. On the other hand, they will eat filter paper or other inappropriate material if it has been drenched with the right chemical.

The adult, a reproductive machine.

The purpose of an adult butterfly is to find a mate and reproduce. For the male, that is virtually his only function. The female also has the task of finding an appropriate food plant for her offspring. Finding the right host is an important task, since the caterpillar has limited mobility and is unable to eat most plants.

Finding and identifying the host plant involves a number of steps. The first step is usually to make a visual search for the potential host plant. Adult butterflies have very good vision and are known to be able to distinguish several colors such as ultraviolet, green, yellow and red. Some species are known to be able to identify their host plant by the leaf shape.

Once a potential host is located, the female lands and verifies the appropriateness of the plant by smelling it. She smells the plant both with her antennae and with smell receptors in the tip of her abdomen. If the smell is right, she lays her eggs on the host plant, but if it is not, she leaves without laying an egg. Exact details on how this is done will vary between species.

Enemies and Defenses

Butterflies are attacked by a wide range of enemies including a variety of predators, parasites, and diseases. Birds, lizards, mammals, and many arthropods such as ants, predatory bugs, wasps, praying mantids and spiders may consume them. All life stages, even the eggs, are attacked. Tiny parasitic wasps lay their eggs inside butterfly eggs. The wasp eggs hatch and consume the contents of the egg, then pupate and produce a new wasp. Some species of wasps are so small that 20 or 30 wasps can develop in a single butterfly egg. The larval stages are also attacked by parasites and are eaten by a wide variety of predators as well. Bacterial or viral diseases can turn a caterpillar into a mushy sack that disintegrates when touched. In the tropics, ants are particularly voracious predators, consuming eggs, larvae and pupae.

Butterflies make up for these losses in two major ways. One is by having a high reproductive rate. Females can lay several hundred eggs apiece. Another is by having some defenses against attack. Most butterflies lay their eggs singly or in small clusters on many host plants so it is difficult to find all of them. Even if many are killed, a few survive. On the other hand, a few species clump their eggs together in one large cluster. *Hypolimnas anomala* lays all its eggs in one place and then stands guard over the eggs until they hatch. If ants come, the female will beat her wings against the leaf to drive them off.

Adult butterflies often fly erratically, which makes them difficult to catch. Cryptically colored caterpillars may resemble inedible objects or be colored to match their background. Early instars of the black citrus swallowtail are a mottled brown, black and white color that resembles a bird dropping. Other species look like twigs or are green like the leaf they feed on. Other caterpillars use a different strategy. They are brightly colored and conspicuous. These species may poison or injure species that try to eat them. Sometimes they are covered with hairs or have sharp spines that discourage or poison predators.

In some species the caterpillar collects poisons from the host plant and stores them in its tissues. The poisons are retained even when the caterpillar shifts from one life stage to another. In conse-quence, the butterfly itself becomes toxic or distasteful. For example, monarch butterflies *(Danaus plexippus)* accumulate certain poisons called cardiac glucosides from their host plants. If a bird eats a monarch butterfly, it will begin vomiting within a few minutes. Most birds will

only eat one butterfly that causes such a reaction, and thereafter will not touch a monarch again. Several of the Micronesian butterflies may be poisonous, but they have not been studied in this regard.

Certain species of butterflies defend themselves not by being poisonous, but by resembling or mimicking the poisonous butterflies. The mimic species is quite edible, but predators leave it alone since they confuse it with the toxic butterfly. The females of *Hypolimnas misippus* are remarkably similar in appearance to another species of milkweed butterfly, *Danaus chrysippus,* that co-occurs in most of its range, though not in Micronesia. *Danaus chrysippus* is thought to be distasteful to birds, and *Hypolimnas misippus* to be a mimic, gaining protection from predators by appearing to be the distasteful species.

Kinds of butterflies in Micronesia

Butterflies are divided by taxonomists into several groups called families. The ones occurring in Micronesia are listed below. Plate 1 illustrates caterpillars and pupae of the various families of butterflies.

Hesperiidae or skippers:

Skippers get their name from their fast and erratic flight. On Guam, the most easily observed species is the banana skipper which zooms around banana trees as dusk falls. The skippers are stout bodied, and generally hold the front and hind wings at different angles when they are at rest. Their antennae have a hooked enlargement at the tip, instead of a knob as in other butterfly families. The larvae are smooth with a large head and a constricted neck. Most feed inside a leaf shelter, and pupate there.

Papilionidae or swallowtails:

These are large butterflies that often have one or more taillike prolongations at the rear of the hind wing. The color of the wings is often dark with white or yellow markings, although many tropical species have iridescent blue or green markings. The larvae are usually smooth bodied and possess a reversible scent gland or osmete-rium behind their head. If the larva is disturbed it will evert this scent gland, and produce a strong odor. Large larvae may have markings resembling eye spots on the upper part of the body towards the head. By bunching themselves up, tucking the actual head down, and everting their red-forked osmeterium, the caterpillar assumes a startling resemblance to the head end of a small snake. The caterpillars are quite harmless, but the effect may fool birds and scare them away. The young larvae of *Papilio polytes* have a very different color pattern, resembling bird or gecko droppings. The chrysalises are usually held upright by means of silken girdle around the middle.

Pieridae or whites and sulfurs:

These butterflies are usually white or yellowish in color with black markings. Their larvae are fairly smooth with minute bumps. Their chrysalises are held upright by a silken girdle. Three genera, *Appias, Catopsilia* and *Eurema* are present in Micronesia. *Appias* and *Catopsilia* have a white or pale yellow background color and *Eurema* species are sulfur colored.

Lycaenidae or blues:

These are the smallest butterflies. The Micronesian species are almost all tinted blue or gray. Some species, particularly the males, have a spectacular iridescent blue color. Many species have tail-like projections on their hind wings, although these are often tiny and not visible without close inspection. Their caterpillars usually are slug shaped, wider in the middle than at the ends, with retractable heads. Many species have glands on their bodies and have remarkable associations with ants. In these species, the caterpillars produce an attractive liquid with their glands that appeals to ants as food. In return the ants may defend the larvae on the host plant, to prevent their valued resource from being eaten by predators. In other cases, the ants will carry the larvae to a sheltered place at least at night. In some cases they carry the larvae into their nests, where the caterpillars proceed to gobble up the ant larvae, apparently unnoticed by their hosts. Little is known about the biology of most of the Micronesian species.

Nymphalidae or brush-footed butterflies:

The common name of the family comes about because the first pair of legs is reduced and lacks claws. Only the back four legs are used for walking. This characteristic is shared with the milkweed butterflies and the satyrs. The larvae of these butterflies commonly have branched spiny projections on their body. Their chrysalises hang upside down.

Satyridae or satyrs:

Only one species in this group, the evening brown *(Melanitis leda),* is found in Micronesia, but this one species is present on all the high islands in this region. The larvae have short hairs, but no spines, except that they have "horns" on their head.

Danaidae or milkweed butterflies:

Two genera of this family occur in Micronesia: *Danaus,* which feeds on milkweeds and includes the monarch, and *Euploea* or crow butterflies which feed primarily on various species of figs such as banyans, although they will also eat oleander. Both have conspicuous larvae with red, black, and white stripes and several fleshy projections on their bodies. As described earlier, monarch butterflies are poisonous if eaten. This is probably true for most of the species in this family as long as they are feeding on poisonous host plants. The chrysalises of the monarch are green with gold spots, and those of the crow butterflies are silver or gold. Unfortunately these latter only retain their color as long as a living butterfly is inside. The male crow butterflies have scent glands and expandable hairs on their abdomens. These glands are primed with sexual perfumes to attract females. The perfumes, or pheromones, are derived from chemicals called pyrrozoline alkaloids, which are collected from dried twigs of certain trees such as beach heliotrope, and then processed in their bodies into the pheromones. At times, dense aggregations of male butterflies can be observed collecting chemicals on dead twigs of beach heliotrope.

Distribution of butterflies in Micronesia

The exact number of species of butterfly in Micronesia is not known. Not all of the species have been formally described, and we, or other reliable sources, have observed species that are not represented in any of the formal collections in museums. These species have not been positively identified, and are not included in this guide. By publishing this guide, we hope that we

will stimulate people to notice and collect specimens that are not covered, and make them available to area museums so that future works can be complete.

The largest number of species are found in western Micronesia nearest the Philippines and New Guinea, and the fewest in the eastern Carolines and Marshalls, which are small islands distant from sources of immigrants. Palau, with at least 41 species, has the richest fauna of butterflies, followed by Yap (22 species) and Guam (20 species). Chuuk has nine species, Pohnpei five, Kosrae four, and the Marshalls four. Guam has 10 species that are common and can be found readily, six species that are local or rare, and four species that are extremely rare or, more likely, extinct. In the Carolines, more than half of the butterflies are common and can be found readily. In the Marshalls, of the four species present, three are abundant.

Most of the butterflies in Micronesia are widely distributed, common species. Only three or four species are endemic or unique to Micronesia, although there are also some unique color forms that are recognized as subspecies. *Euploea eleutho* and *Vagrans egistina* are known only from the Marianas. On Palau, there is an undescribed species of *Prosotas,* and a species of *Phalanta* that may be undescribed and endemic. In Palau and the Marianas, *Hypolimnas octocula* has unique color forms that are recognized as subspecies, and a number of lycaenids have recognizable variants in Micronesia. In Palau, *Papilio polytes* may be a unique subspecies, but in Yap and the Marianas the butterfly is a recent immigrant from the Philippines that has not evolved any differences.

General Information

The current work is not a comprehensive taxonomic study, but is intended to be a guide to identification of the butterflies. In most cases, we have used the scientific names of specimens as they were identified in the B. P. Bishop Museum, though we have attempted to update all the names to the most modern available in the literature. Where expertise was available, we have sought additional help from specialists. When the butterflies in the region are studied formally by taxonomists, we are certain that new species will be identified, and some of the current identifications may be found to be incorrect.

For common names, we have used those from other locations for those species that have them. Most of the common names come from the Butterflies of Australia, or from the Butterflies of the Malay Peninsula. We have, for species without common names, added our own, generally based on generic group names.

Rearing butterflies

Most butterflies are easy to rear and this is a very interesting way to learn about the habits of insects. Equipment is simple to obtain, and inexpensive. All that is needed is a large glass or plastic jar. The jar should be large enough for the butterfly to completely spread it wings when it emerges. If it is not large enough, the wings will be crumpled or distorted.

Anyone wishing to rear a caterpillar must be certain that they identify what plant and what part of the plant the caterpillar was eating in the field. Butterflies are often very specific about what they eat, and they will die if not fed the right food. Add the food to the jar with the caterpillar. Make sure the food remains fresh, and remove old food and wastes. Do not let wastes build up in the jar, as this can encourage molds and diseases. Provide some twigs or other solid

supports for the larvae to pupate on, and for the butterfly to cling to once it emerges and needs to spread and dry its wings. The jar should have some ventilation so excessive moisture does not build up. During the pupal period, enough moisture needs to be present to keep the pupa from drying. If the butterfly is too dry during the pupal period, it may die or its wings may not spread properly. Generally all that is necessary is to keep the pupa in a non air-conditioned room. In air-conditioned rooms, it may be necessary to add a moist towel to the jar.

Conservation of butterflies

Most insects, including butterflies, suffer high mortality and have a high reproductive rate to offset it. The removal of a few specimens by collectors will have little, if any, impact on the long term survival of the species for common butterflies. Many Micronesian butterflies feed on weedy plants or garden plants which are very common. These butterflies are often very abundant, and it is unlikely that collecting will affect their populations. A few species are rare and occupy very local or special habitats. Populations of these species may be at risk if they are harvested excessively. Large quantities of these species should not be collected, and in most cases, only males should be taken. Their removal has little impact on population dynamics, while the removal of a female also removes all of her potential progeny. More importantly, the habitats of these butterflies must be preserved. Removal of specimens by collectors often means that there is only one less butterfly for a bird or a spider to eat, but destruction of the habitat stops all reproduction and causes the extinction of the species from the area. Species that are found only in restricted areas and require native vegetation for their survival are at the greatest risk. Careless development of these areas may easily result in the extinction of these species.

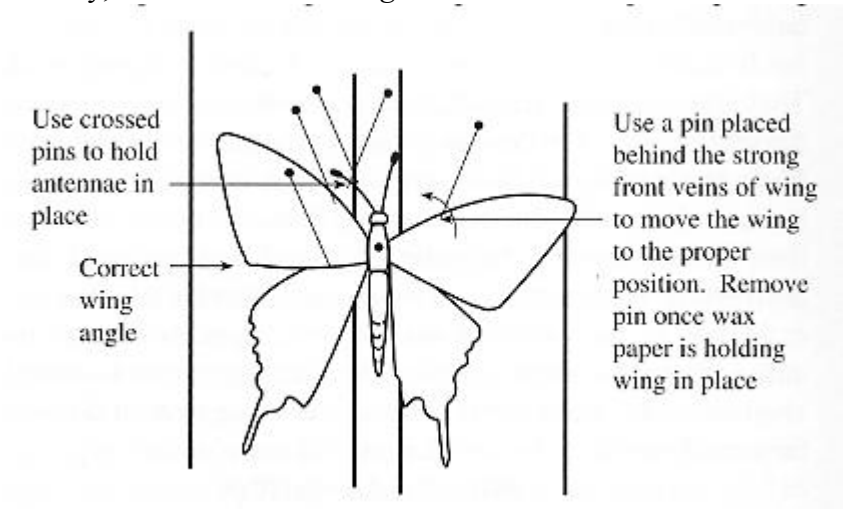
Collection of butterflies

Collecting butterflies, or rearing them, is a good exercise for children to learn about insects, and is a pleasant hobby. Butterflies should be captured in nylon nets. Specimens with damaged wings should be released, and only good specimens should be kept. Nets can be purchased, or they can be made from readily available materials. Butterflies can be killed in special jars with plaster tops or bottoms to which a few drops of ethyl acetate has been added. Alternatively, butterflies can be killed in the net by pinching their thorax sharply while the wings are closed.

Once the specimen is dead, it should be mounted for display. Mounting involves pushing a special entomological pin through the center of the thorax and then spreading the wings. These pins are about 1.5 inches long and come in a ranges of thicknesses. For butterflies, the most useful size is No. 3 pins, although very small butterflies may require No. 1 pins, and very large ones such as the birdwings may require No. 5 pins. Pins, nets, killing jars and ant-proof storage boxes can be purchased from biological supply companies including BioQuip (1703 LaSalle Avenue, Gardena, CA. 90248-3602), Carolina Biological Supply Company (2700 York Rd, Burlington, NC 27215), Wards (P.O. Box 1712, Rochester, NY 14603), etc.

Once pinned, the specimen is placed on a special pinning board with a central groove . The board is used to hold the wings in a particular position until they dry. The body of the insect is pinned into the central groove. The pin is pushed down far enough so the bases of the wings are even or very slightly below the adjacent edge of the board. The wings are moved with a forceps,

or preferably, with a pin inserted just behind the edge of the large vein at the leading edge of the wing. The front wing is pushed forward until the hind edge of the wing is perpendicular to the axis of the body. The hind wing is placed so that its leading edge is underneath the forewing. The butterfly must be relaxed to spread the wings without damaging them. Specimens killed in ethyl acetate will go into *rigor mortis,* and may be too stiff to pin, but will relax naturally after a period of several hours. Pinched specimens may be mounted within fifteen minutes. You can generally judge how relaxed your specimen is by how freely the wings move. The wings of relaxed butterflies move readily, whereas ones with *rigor mortis* are stiff and difficult to move.



Once spread, strips of waxed paper can be placed over the wings to keep them in position and flat while they dry. The paper should be firmly anchored with pins, and any pins used in spreading the wings should be removed. The abdomen should be supported so that it is level and does not hang down. Usually this can be done by crossing two pins and resting the abdomen in the fork where the pins cross. The antennae should be arranged so they are spread parallel or slightly forward to the leading edge of the forewing. Drying may take several days, depending on conditions. Make sure the specimens are kept in a place free of ants or other pests. We frequently use a frost-free freezer.

Once dry, the specimens should be stored in a tight-fitting box. The box should be sealed well enough to prevent ants and other small insects from entering. Moth balls and chlorocresol should be added to inhibit mold and to prevent small insects such as dermestid beetles and booklice from consuming your specimens. Both chemicals should be confined in the box so they do not move around and damage your specimens. Periodic replacement must be made as the chemicals evaporate and disappear over time.

Plate 1

Caterpillars

1. Hesperiidae *Badamia exclamationis*
2. Papilionidae *Papilio polytes* a. young larva b. full size larva
3. Pieridae a. *Catopsilia pomona* b. *Eurema blanda*
4. Lycaenidae *Lampides boeticus*
5. Danaidae a. *Danaus plexippus* b. *Euploea eunice*
6. Nymphalidae *Hypolimnas anomala*
7. Satyridae *Melanitis leda*

Pupae

8. Hesperiidae a. *Badamia exclamationis* b. *Erionota thrax*
9. Papilionidae *Papilio polytes*
10. Pieridae *Catopsilia pomona*
11. Danaidae a. *Danaus plexippus* b. *Euploea eunice*
12. Nymphalidae *Hypolimnas anomala*
13. Satyridae *Melanitis leda*

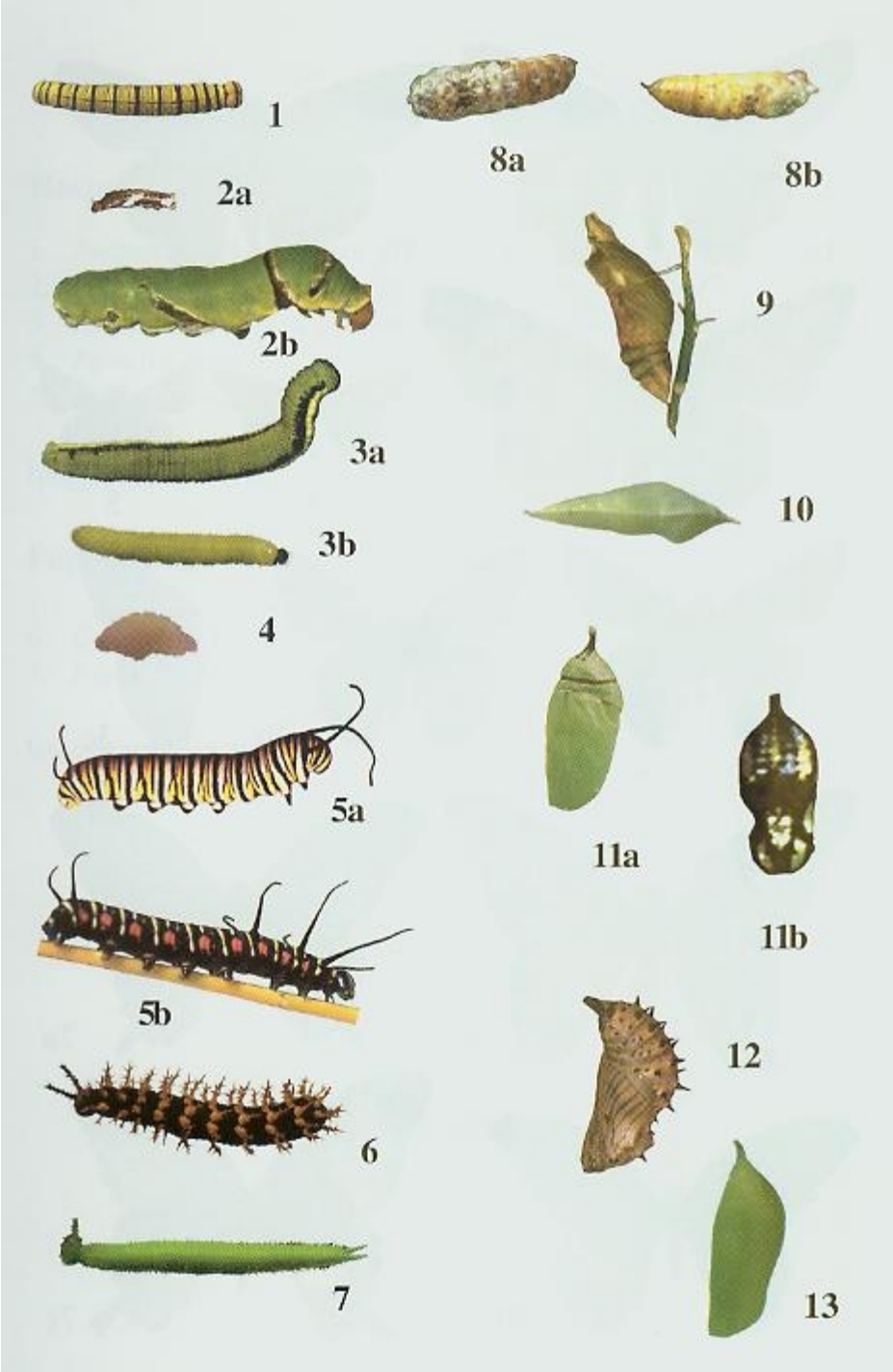


Plate 1

Plate 2

Hesperiidae

1. *Badamia exclamationis* a. Guam b. Palau
2. *Erionota thrax*
3. *Hasora chromus* a. male b. female c. underside of male
4. *Parnara naso*
5. *Taractrocera ziclea*

Papilionidae

6. *Graphium agamemnon*
7. *Papilio polytes* a. Guam b. Palau c. Palau, mimic form

Plate 2

Plate 3

Papilionidae

1. *Papilio xuthus*

Pieridae

1. *Appias ada* a. male b. male underside c. female d. female
2. underside
3. *Appias paulina* a. male b. male underside c. female d. female
4. underside
5. *Catopsilia pyranthe* a. male b. female

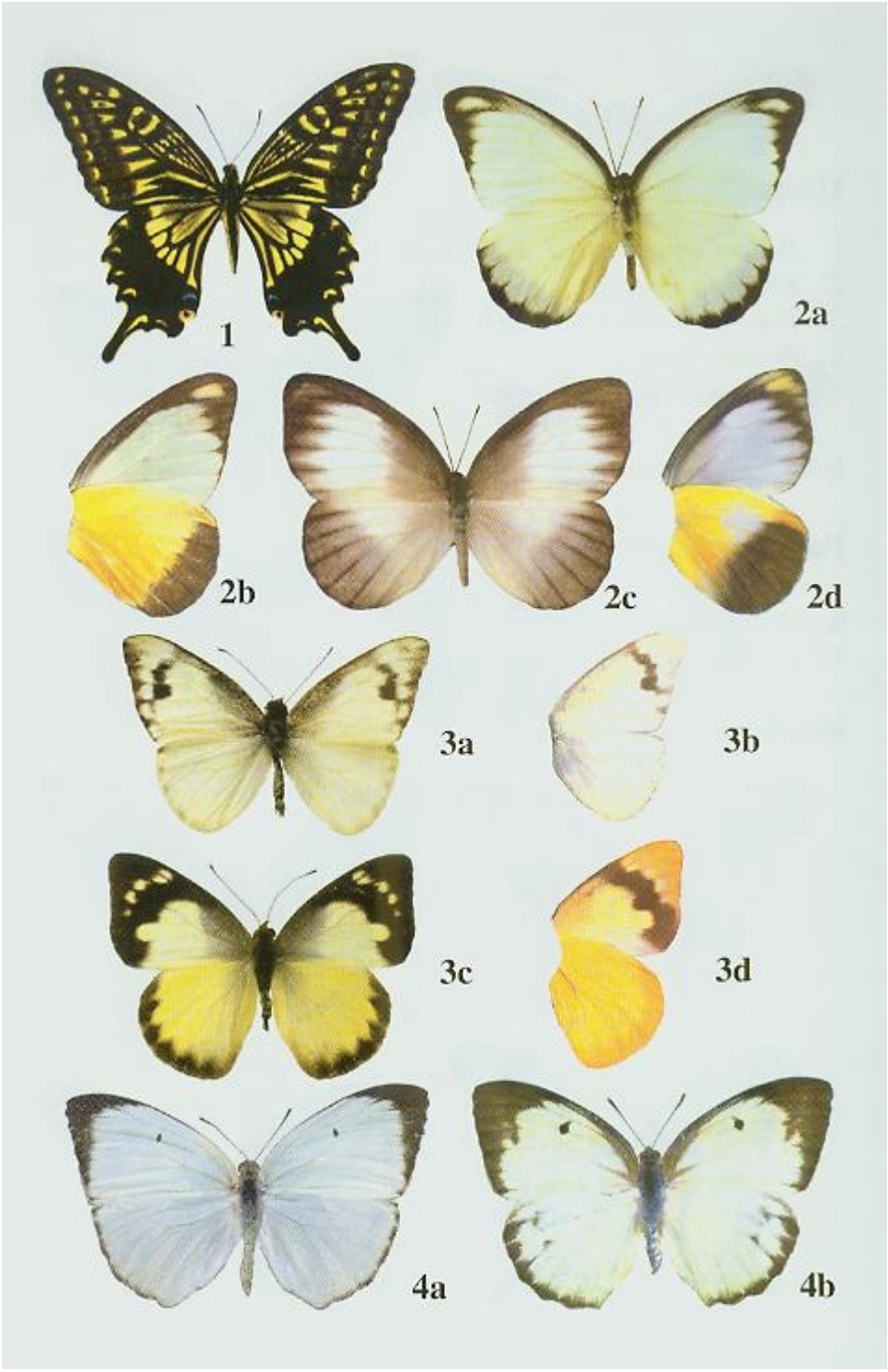


Plate 3

Plate 4

Pieridae

1. *Catopsilia pomona* a. male b-c. female color variants
2. *Eurema blanda* a. male b. female c. underside
3. Arrow marks spot which can consistently differentiate *E. blanda* from *E. hecabe* in Micronesia. Spot present on *E. blanda;* absent on *E. hecabe.*
4. *Eurema brigitta*
5. *Eurema hecabe* a. male b. female c. underside

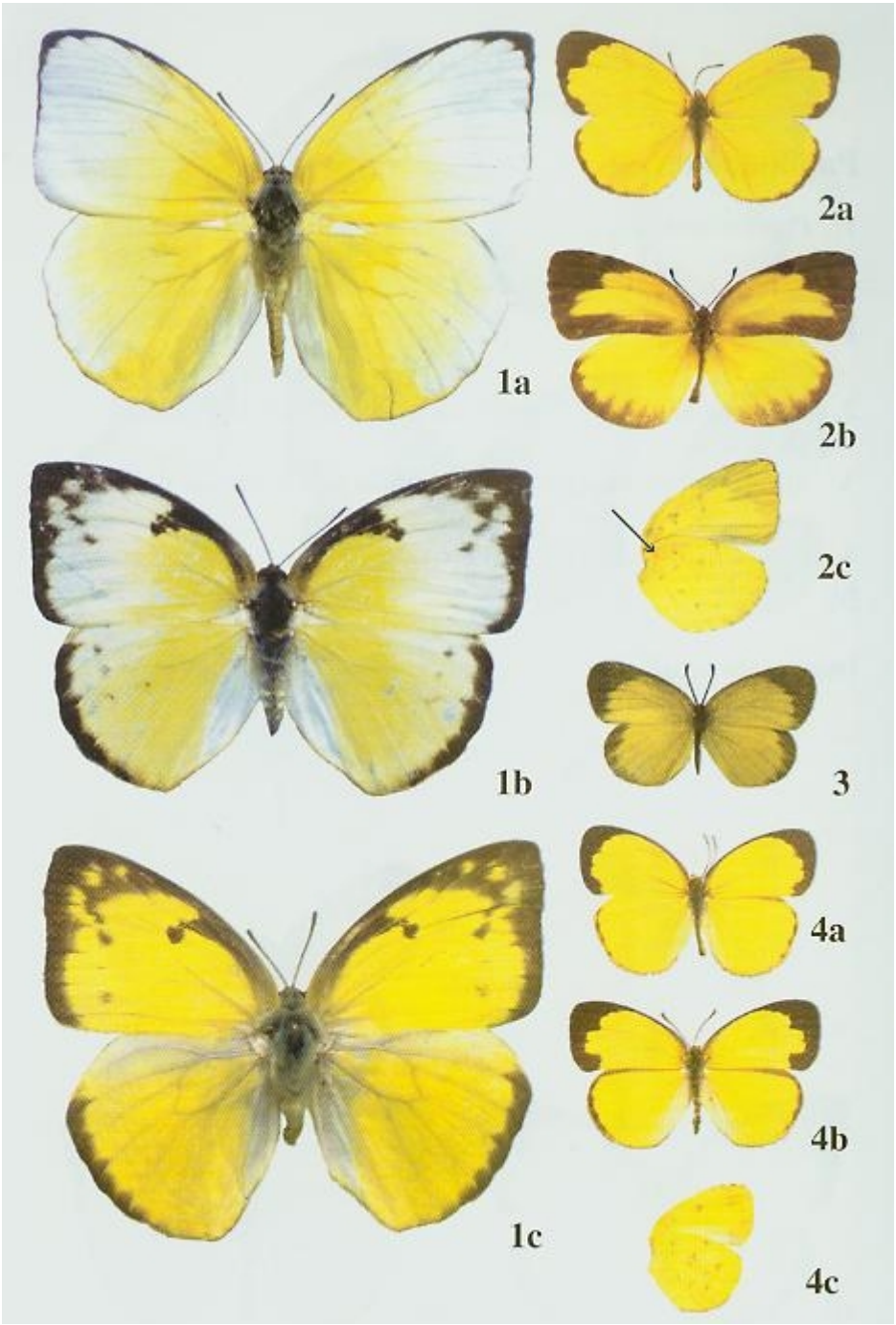


Plate 4

Plate 5

Lycaenidae

1. *Acetolepis puspa* a. male b. female c. underside
2. *Bindahara phocides*
3. *Catochrysops amasea* a. male b. underside
4. *Chilades pandava* a. male b. female c. underside
5. *Euchrysops cnejus* a. male b. female c. underside
6. *Everes lacturnus* a. male b. female c. underside
7. *Famagena alsulus* a. male b. female c. underside
8. *Jamides bochus* a. male b. female c. underside

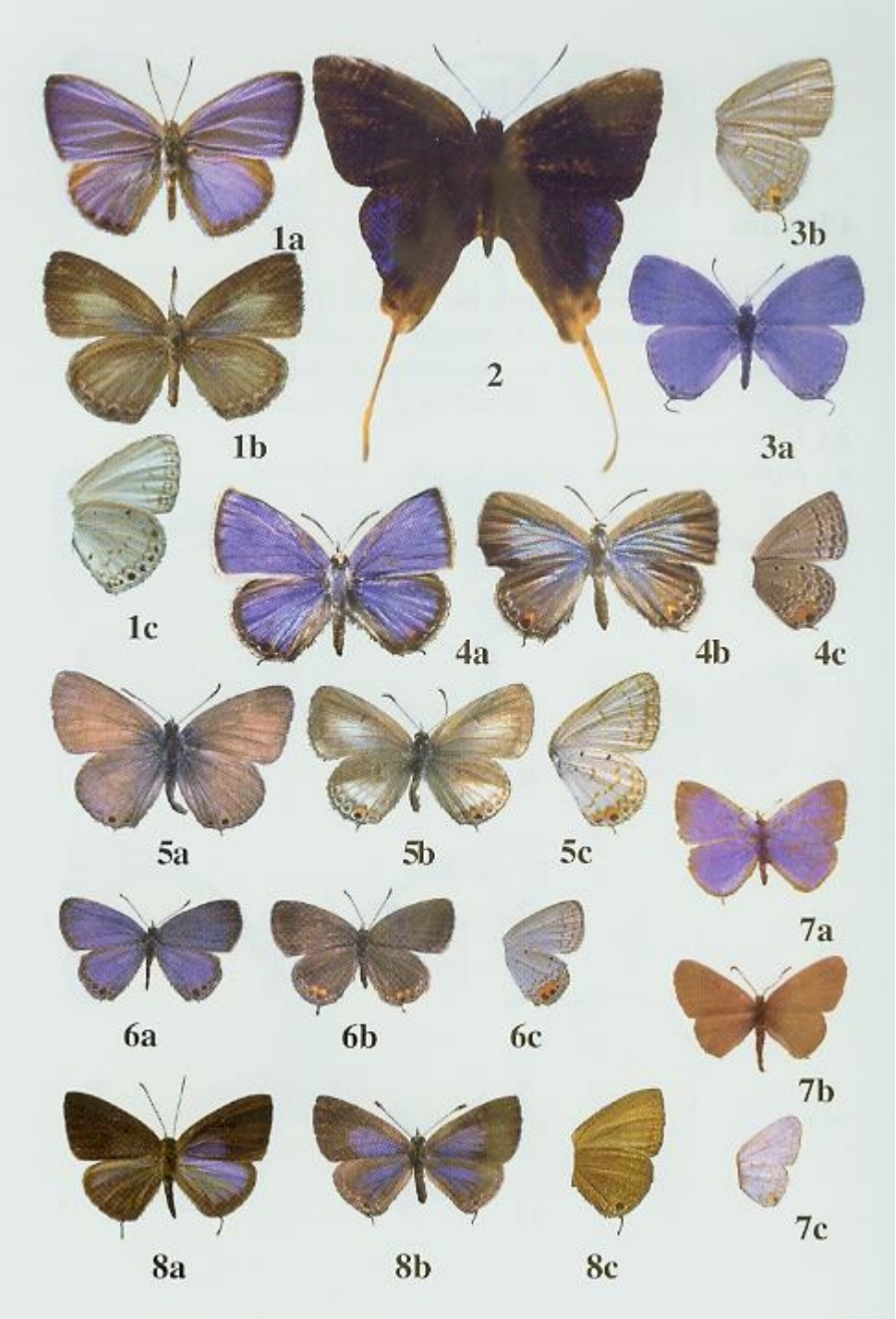


Plate 5

Plate 6

Lycaenidae

1. *Lampides boeticus* a. male b. female c. underside
2. *Megyspa strongyle* a. male b. underside
3. *Nacaduba kurava* a. male b. female c. underside
4. *Nacaduba* sp. a. male b. female c. underside
5. *Petrelaea dana* a. male b. underside
6. *Prosotas* sp. a. male b. underside
7. *Syntarucus plinius* a. female b. underside
8. *Zizina otis* a. male b. female c. underside
9. *Zizula hylax* a. male b. female c. underside

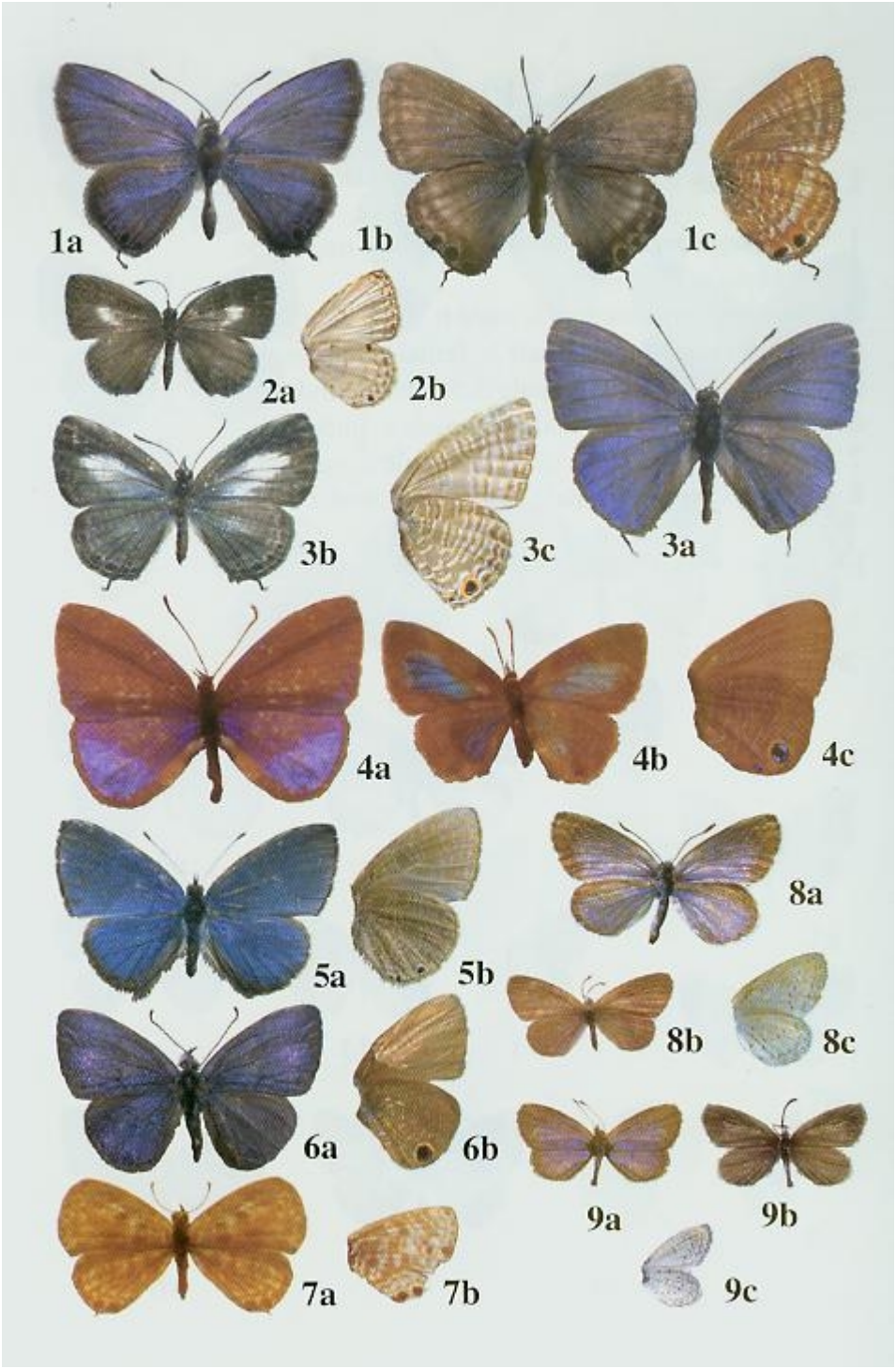


Plate 6

Plate 7

Danaidae

1. *Euploea abjecta* a. male b. female
2. *Euploea elutho*
3. *Euploea eunice* a. male b. female
4. *Danaus affinis*
5. *Danaus plexippus*

Satyridae

6. *Melanitis leda* a. Guam b. Kosrae

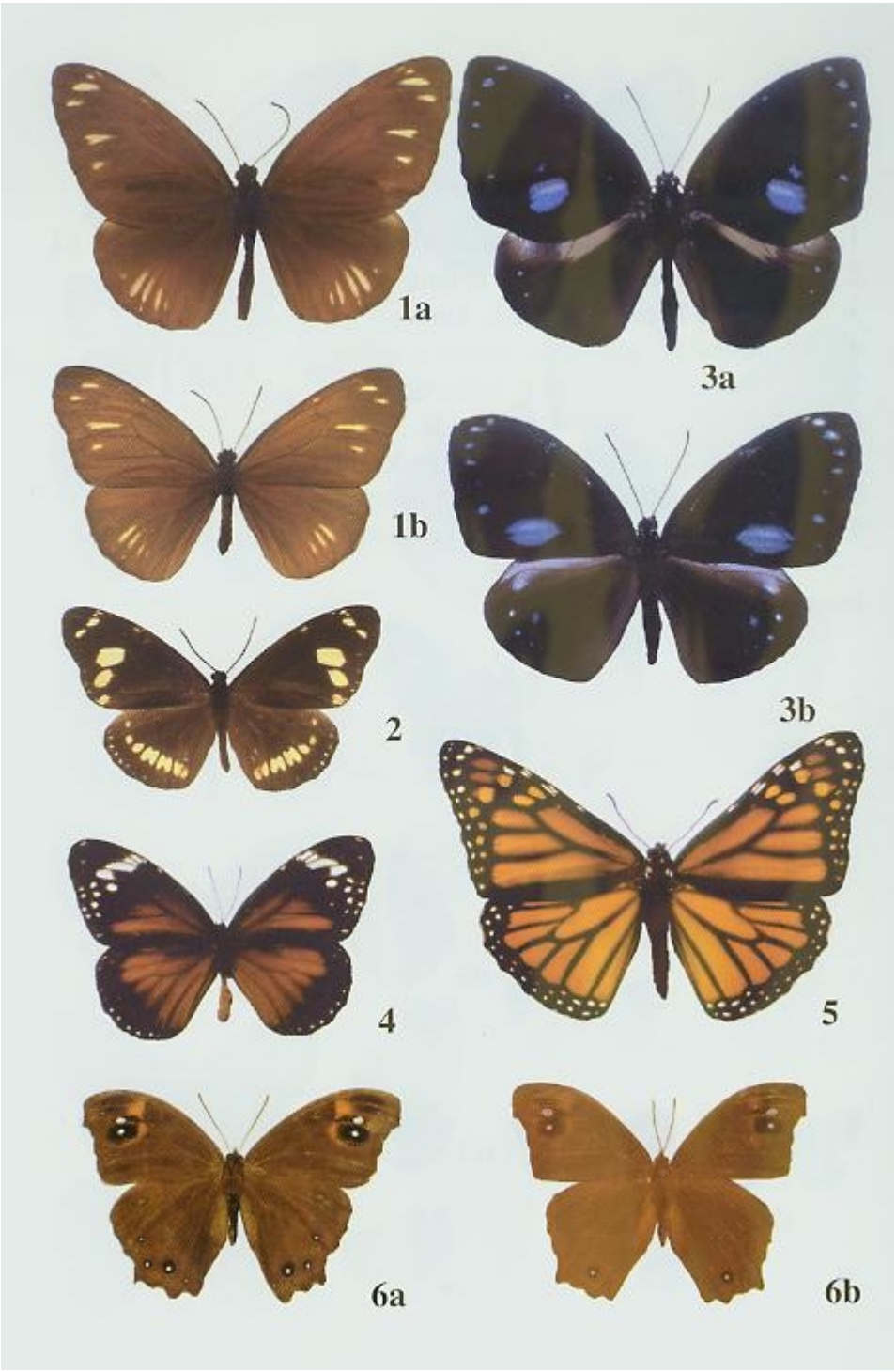


Plate 7

Plate 8

Nymphalidae

1. *Dione vanillae*
2. *Hypolimnas anomala* a-c. color variants
3. *Hypolimnas bolina* a. male b-c. female color variants d. female Jaluit form
4. *Hypolimnas misippus* female
5. *Hypolimnas pithoeka*

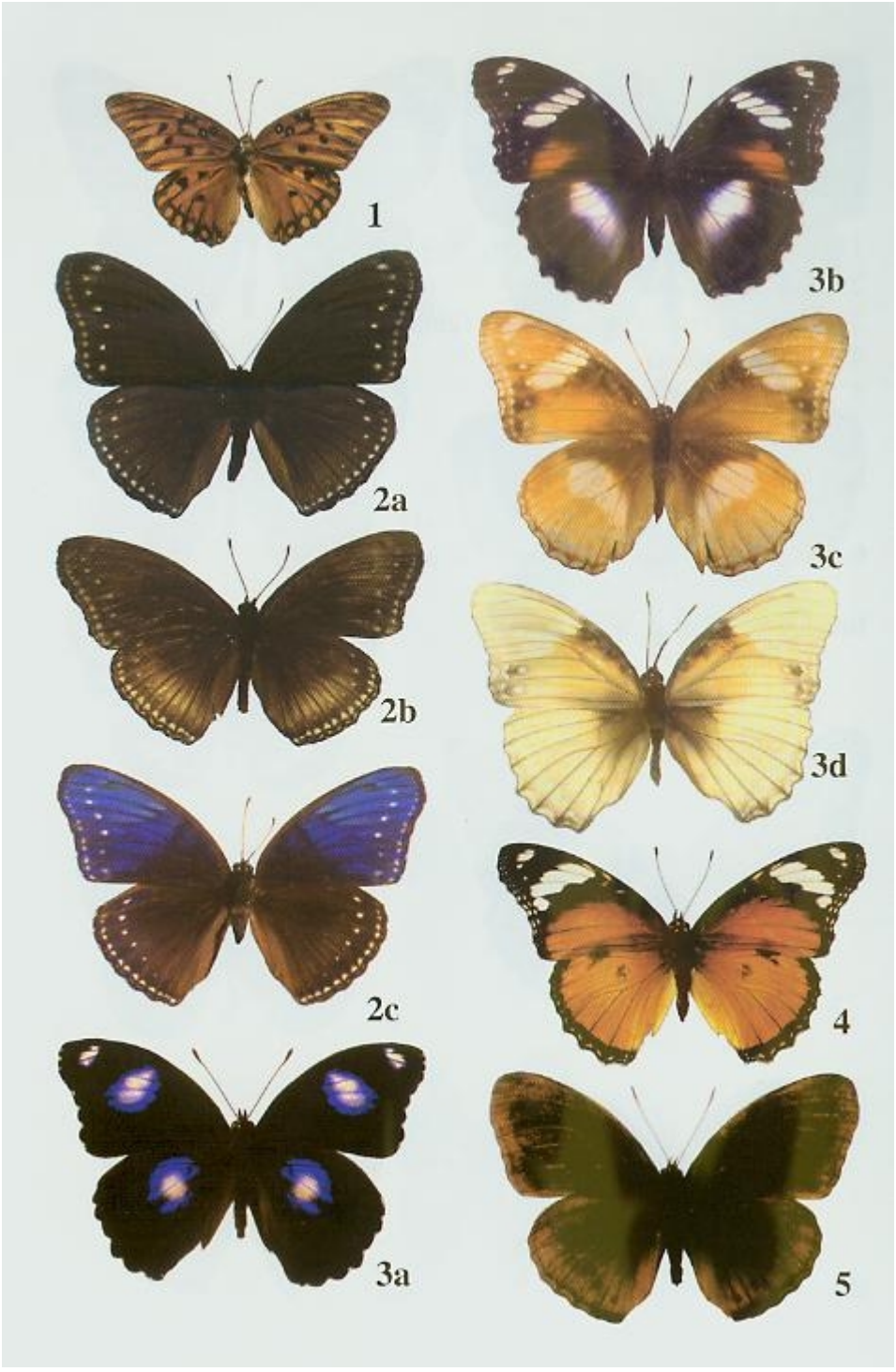


Plate 8

Plate 9

Nymphalidae

1. *Hypolimnas octocula* a. male Guam b. male Palau c. female Palau
2. *Junonia hedonia*
3. *Junonia villida*
4. *Phalanta* sp.
5. *Vagrans egista*
6. *Vagrans egistina*
7. *Vanessa indica*

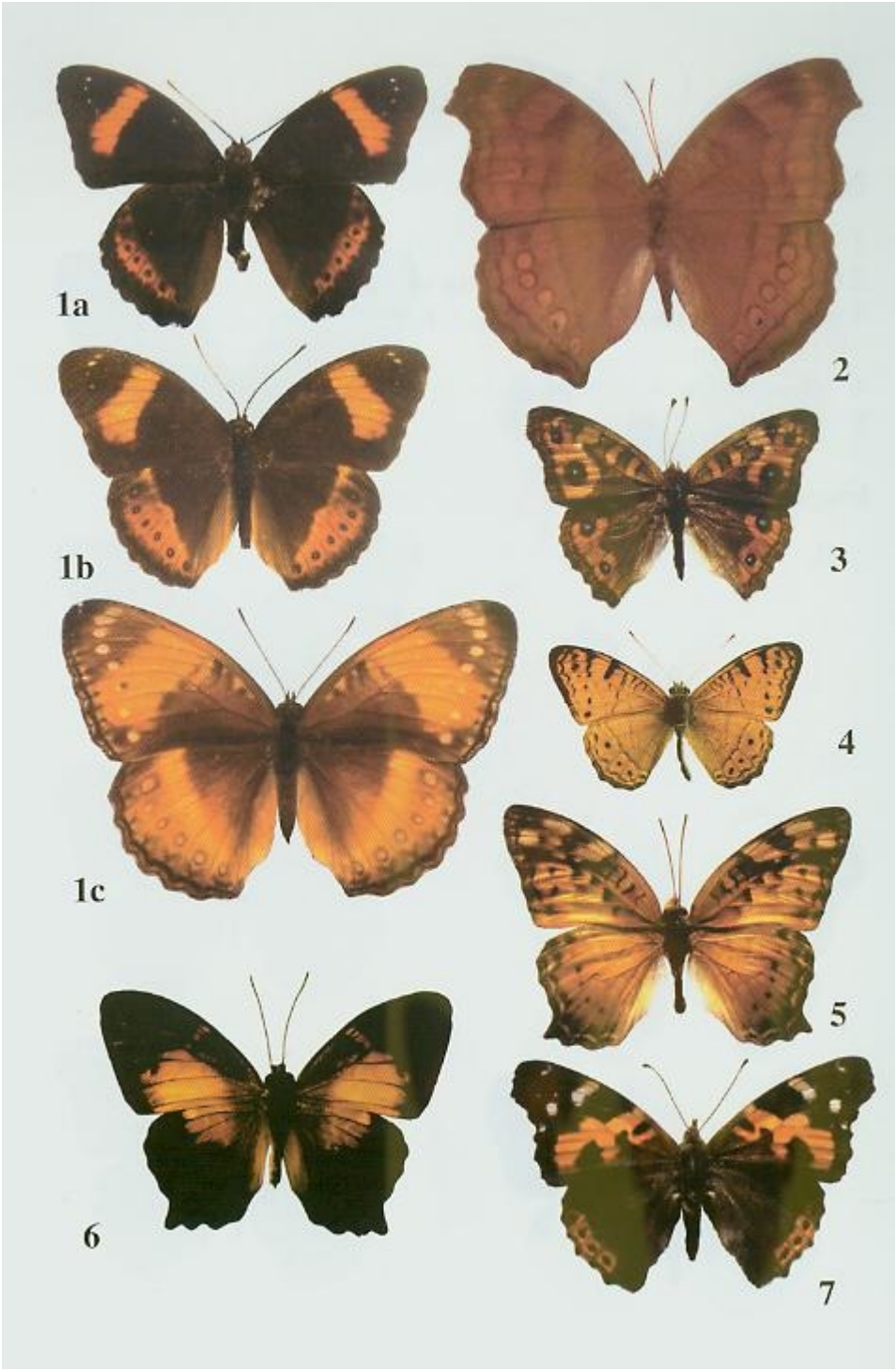


Plate 9

Species of butterflies

Hesperiidae

Badamia exclamationis **(F.)** **Plate 2**
Guam, Palau and Marshalls
Brown skipper or brown awl. Range: Sri Lanka to China and Australia, and out to the Marquesas in the Pacific region. In the Marshalls it is reported from Likiep, Bikini, Kwajalein, and Majuro. It is a day-flying skipper, that can be seen flying rapidly around its host plant on sunny days. The caterpillar rolls young leaves of *Terminalia catappa* together, and lives, feeds and pupates within the roll. The caterpillars are striped black, white and yellow. There are some differences in the pattern on the wings of these skippers from different islands.

Erionota thrax **(L.)** **Plate** 2
Guam, Saipan, Tinian, Rota
Banana skipper. Range: Sikkim to the Moluccas and recently Hawaii. It is a recent migrant to the Marianas. The species arrived inGuam around 1957. It was probably brought in as eggs on bananaplants, as a parasitic wasp attacking its eggs came with it. Thewhitish pink eggs are laid in clusters on banana leaves. When thelarvae hatch, they cut the edge of the banana leaf and roll it around
themselves to enclose themselves in a tube. The larvae are covered with a powdery, white waxy secretion. Their heads are black.Caterpillars pupate inside the rolled-up banana leaf. During theday, the butterflies rest under leaves, frequently on the host plants.At dusk, they become active, and can be seen darting rapidly aroundbanana plants. They often feed on the nectar of banana flowers.

Hasora chromus **(Cramer)** **Plate 2**
Palau, Guam
Common banded awl. Range: India to Australia and Fiji. They are swift fliers. Most species in this genus are crepuscular, flying primarily in the evening or at dawn. On Palau, it has been reared on *Pongamia pinnata.* The larvae have variegated coloration. It was first noted on Guam in 1996, although as it is limited to the jungle on the cliffs at Ritidian Point, it may have been present for manyyears and not previously collected.

Parnara naso **F.** **Plate 2**
Palau
Straight swift. Range: North Africa to Northern Australia. Thelarvae are green or greenish white with a dark dorsal streak and abrown head. The larva dwells inside a house made by webbingleaves together. It pupates between the leaves where it has beenfeeding. Hosts include rice, sugar cane, bamboo, taro and corn.

Taractrocera ziclea **(Plotz)** **Plate 2**
Guam
Grassdart. Range: Thailand to the Philippines. It is a relatively recent introduction into Guam, probably arriving soon after World War II. No host records for the species are known, but most

likely the larvae feed on a variety of grasses or sedges. It is found most often in areas of short grass.

Papilionidae

***Graphium agamemnon* (L.)** **Plate 2**

Palau

Tailed jay or the green spotted triangle. Range: North India to theSolomons. A number of subspecies are known from various islands.Mature larvae are ocher yellow to dark green. Each segment bearsa brown spine, which on segment three arises from an orange spot.The pupa is a watery blue-green with yellow markings on the thorax. In Palau we observed it primarily around Koror, probablyfeeding on Annonaceae in gardens. Males appeared to set up territories around certain trees, and were observed flying rapidly aboutbut returning to the same spots. Food plants of the larvae in Asiainclude *Annona, Saccopetalum, Friesodielsia, Polyalthia,Mitrephora frogatti* (all Annonaceae) and *Michelia.*

***Papilio polytes* L.** **Plate 2**

Palau, Yap, Guam, Saipan, Tinian, Rota

Black citrus swallowtail or common mormon. Range: Sri Lanka and India to China and south into the Philippines. In Malaysia it is considered to be a rather urbanized species that is rarely found in the forest. It is probably a relatively recent arrival in the Marianas, first being recorded on Guam in the 1950s. There are distinct races living on various islands. The ones in the Marianas and Yap have tails, whereas the ones in Palau do not. In Palau, there are occasional specimens of a second morph that is a mimic of *Pachliopta aristolochiae,* a butterfly that feeds on *Aristolochia,* a type of plant that is highly poisonous to vertebrates. This morph is gray and white with red markings. The butterflies are attracted to salt and are frequently found at puddles. Food plants include citrus and other Rutaceae.

***Papilio xuthus* L.** **Plate 3**

Guam, Saipan, Kosrae

Citrus Swallowtail. Range: East Asia, Hawaii, and Luzon. In the 1930s Swezey stated that this butterfly was very abundant on Guam and could be seen in large numbers at the edges of puddles along roads. It is now thought to be extinct in the Marianas, as the last specimen known to have been caught on Guam was collected in 1968. *P. polytes* has apparently replaced this species in Saipan also. No individuals of P. *xuthus* were observed in Kosrae on recent collecting trips in 1984 and 1986, and it seems possible the butterfly is no longer present anywhere in Micronesia. The host plants are various species of Rutaceae. On Guam the larvae commonly fed on *Triphasia* and *Citrus* species.

Pieridae

***Appias ada* (Cramer)** **Plate 3**

Palau, Yap

Rare albatross. Range: Australian and Papuan region. About 20 different geographical forms are known. In Palau and Yap it is not a rare butterfly.

***Appias paulina* (Cramer)** **Plate 3**

Guam, Palau

Common albatross. Range: Sri Lanka to Taiwan to Australia and Samoa. The larva has a yellow head with dark spots, and a green body with black spots and a white dorsal line. Although there are many specimens of this species in the Bishop Museum originating from Guam, it has not been observed there in recent years. Its probable host in Micronesia is capers.

***Catopsilia pomona* (F.)** **Plate 4**

Palau, Guam, Saipan, Tinian, Rota

Lemon migrant. Range: Madagascar to Solomon Islands, with several subspecies known. The larvae feed on various species of *Cassia* including golden shower trees and candle flower. The butterfly is frequently found in moist spots on the road, and is known to engage in migratory flights.

***Catopsilia pyranthe* (L.)** **Plate 3**

Palau, Yap

Mottled emigrant, or common migrant. Range: Oriental region to the Solomons. The larvae are green with a whitish lateral stripe. They usually feed on species of *Cassia.* There are records of this species taking part in migratory flights.

***Eurema blanda* (Boisduval)** **Plate 4**

Palau, Guam, Saipan, Tinian, Rota

Large grass yellow. Range: India to New Guinea and the Solomon Islands. Its usual host plants on Guam are kamachile *(Pithollecobium dulce)* and *Caesalpinia major* and it seriously defoliates the endangered tree species *Serianthes nelsonii.* It probably feeds on several other leguminous trees and shrubs. Whenadult numbers are high, females can often be seen laying their eggs on flame trees, but the larvae cannot live on this plant. Eggs arelaid in large masses and larvae are gregarious. The full-sized larvais green with a white stripe and tiny prickly hairs. Adults of the various *Eurema* species are difficult to distinguish. In the Micronesian area, the spotting pattern under the hindwing can be used to separate *E. blanda* from *E. hecabe* (see plate 4).

***Eurema brigitta* (Wallace)** **Plate 4**

Palau

No-brand grass yellow. Range: Sulawesi to northern Australia. In New South Wales *Cassia mimosoides* is reported as a host, but other species of *Cassia* are not. *E. brigitta* has no spots on the undersides of its wings. This characteristic can be used to separate it from the other Micronesian *Eurema.*

***Eurema hecabe* (L.)** **Plate 4**

Palau, Yap, possibly Chuuk and Kosrae

Common grass yellow. Range: Sri Lanka to Japan to Tonga. This species is said to the most common butterfly of the eastern tropics. Outside of Micronesia, it has been reared on legumes including *Cassia, Acacia, Sesbania,* and *Albizzia,* and some Euphorbiaceae. The full-sized larva

is green with a white stripe and tiny prickly hairs. Specimens labeled as having been collected in Chuuk and Kosrae are present in the Bernice Bishop Museum, but we have not observed it on either island recently. It may be rare, or possible the specimens are mislabeled as only one specimen is known from each island.

Lycaenidae

***Acytolepis puspa* (Horsfield)** **Plate 5**

Palau, Yap

Common hedge blue. Range: Oriental region. In Yap, the butterfly appears to have a restricted distribution, as we collected it only along the edge of one stream. In the Orient, larvae have been reared on *Scleichera oleoas, Hiptage benghalensis* and *Xyliadolabriformis.* The larvae are not closely associated with ants.

***Bindahara phocides* (F.)** **Plate 5**

Palau, Yap

Plane. Range: Sri Lanka through Australia and Solomons. The male is deep blackish brown, with a rusty colored wing tip. The female is reddish brown with a large black spot on the hind wing. The adults fly rapidly and often settle at the end of a twig high above the ground. They are typically active in the late afternoon or early evening. The climbing shrub *Salacia prinoides* is recorded as a host in Asia. The larvae feed in fruits.

***Catochrysops amasea* Waterhouse and Lyell** **Plate 5**

Palau, Yap, Chuuk

Island forget-me-not. This butterfly also occurs in Cape York and the Torres Straits Islands north of Australia.

***Chilades pandava* (Horsfield)** **Plate 5**

Saipan

Plains cupid. This butterfly is a very recent introduction to Saipan,first noted in 1996. Its previously recorded distribution rangedfrom Sri Lanka to Thailand and eastern Indonesia. The larvae feedon *Cycas revoluta* (often called sago palm in the Marianas), andpossibly other plants. In Asia the larvae are attended by ants.

***Euchrysops cnejus* (F.)** **Plate 5**

Palau, Yap

Cupid. Range: India to Samoa. The larva is pale green with dark dorsal and subdorsal lines, the latter coalescing to from a dark band on the anal segments. The segments are covered with minute white tubercles, and the spiracles are black. In Fiji, food plants include *Phaseolus* sp., *Vigna* sp. and *Crotolaria mucronata,* and there is said to be a symbiosis with the ant *Camponotus compressus.* Specimens from Palau are bigger than those from Yap, and the Palauan females have more white on their hind wings.

***Everes lacturnus* Godart** **Plate 5**

Yap, Palau

Tailed cupid. This is a mostly Holarctic and Himalayan genus, with just this one species

reaching down to tropical Asia and beyond to Australia. The larva is green with darker dorsal and sub- dorsal lines and a paler lateral line. Hosts are in the family Fabaceae.

***Famegana alsulus* (Herrich-Schaffer)** **Plate 5**
Palau
Black-spotted grass blue. Range: Australia to Fiji. The larval food is buds and flowers of legumes. The larvae are green with a purplish longitudinal stripe. Each segment has a yellow bordered purple crescent. The larvae are tended by ants. This butterfly is similar to Z *hylax* and Z. *otis*.

***Jamides bochus* (Stoll)** **Plate 5**
Pohnpei, Palau
Cerulean. This species has an extensive range from Sri Lanka to the Cook Islands. It prefers open country and may be found at flowers such as lantana and crotolaria. The known host plants include *Crotolaria mucronata, Derris trifoliata, Vigna marina* and mungo beans.

***Lampides boeticus* (L.)** **Plate 6**
Guam, Saipan, Yap, Palau, Chuuk
Bean butterfly, or peablue or long-tailed blue. Range: Africa, Europe to the Orient, Hawaii and New Zealand. The larvae feed on newly formed pods of legumes. On Guam larvae have been reared from pods of *Crotolaria saltiana, C. quinquefolia* and yard-long beans. Another possible host is *Vigna marina.* Larvae are usually green with variable markings and the pupae resemble spotted bean seeds. Ants do not appear to be associated with this species. In Europe and New Zealand it is known as a migrant. Specimens from Palau and Yap have a distinct white circle around the black spots on the hind wing, but this is less obvious on specimens from the Marianas.

***Megisba strongyle* Felder** **Plate 6**
Palau, Chuuk
Malayan. Range: Philippines and Papuan region. The larva is light green with the middle segments swollen. Hosts are species of Sapindaceae.

***Nacaduba kurava* (Moore)** **Plate 6**
Palau, Yap
White lineblue. Range: Asia to Australia. In Australia, larvae have been found feeding on *Maesa* and *Rapanea*.

***Nacaduba* sp.** **Plate 6**
Palau, Yap
An unidentified *Nacaduba* species is present in the Bishop Museum collection. This may be an undescribed species.

***Petrelaea dana* (de Niceville)** **Plate 6**
Palau
Dana blue. Range: India to New Guinea. The males frequent moist spots on forest roads, but the females are rarely taken. The male is as illustrated, and the female is brown with a whitish area

on the fore wing and iridescent blue scaling on the basal area of both wings.

***Prosotas* sp. Plate 6**

Palau

Cyclops lineblue. This is an undescribed species known only from Palau. Other species in the genus are known to feed on flower buds of various species.

***Syntarucus plinius* F. Plate 6**

Palau

Zebra blue or plumbago blue. Range: Asia to Australia. Its host in Australia is plumbago flowers and buds. The larvae have slightly hairy bodies and are either green with faintly darker markings or brown with diagonal bars on each segment. Only one specimen has been collected in Micronesia, and that one was badly worn. In life the females are as illustrated but with much darker coloring. The males have more blue on their wings.

***Zizina otis* (F.) Plate 6**

Guam, Chuuk, Yap

Lesser grass blue. Range: Oriental region including Japan to Australia. The larvae feed on *Mimosa pudica* and *Alysicarpus vaginalis.* It is very common in short grass. The spotting pattern on the underside of the hind wings can be used to distinguish it from Z *hylax* and *E alsulus.* See *Z. hylax* for further notes on its distribution.

***Zizula hylax* F. Plate 6**

Chuuk, Guam, Yap, Saipan

Tiny grass blue. Range: South Africa to Australia. Specimens from Yap were reared in lantana blossoms. In Africa, flowers of *Oxalis* are larval hosts. Most specimens in the Bishop Museum were collected during the 1950s. At that time many *Z. hylax* were collected on the listed islands. Z *otis* was only collected from Guam. In our collections done in the 1980s, *Z. otis* was common everywhere, but *Z. hylax* was found only on Yap.

Danaidae

***Danaus affinis* (F.) Plate 7**

Yap, Palau Malayan tiger, black and white tiger. Range: S. E. Asia and Indonesia to Vanuatu and New Caledonia. No hosts are recorded from Micronesia. Elsewhere, various Apocynaceae including *Cycnachym carnosum, Ischnostemma selangorica (Vincetoxicum carnosum),* and *Tylophora* sp. have been recorded. In Micronesia, specimens have orange and black hind wings, although elsewhere white areas on the hind wing are common.

***Danaus plexippus* (L.) Plate 7**

Marianas, Yap, Palau, Chuuk, Pohnpei, Marshalls (Majuro) Monarch or wanderer. Range: Americas, now found throughout Pacific and Australia. The larvae feed only on plants in the milkweed family. In Micronesia it feeds on *Asclepias curassavica* and crown flower, *Caltropis gigantea.* On Pacific islands this butterfly shows up soon after host plants arrive. In 1936, Swezey noted that the weed *A. curassavica* was very abundant on Guam, forming dense stands almost acres in

extent, and the butterfly was also very abundant. Possibly the butterflies provided some control of the weed, as it now never forms dense stands. This butterfly is well known as a migratory species, capable of making flights of several thousand miles.

***Euploea abjecta* Butler** **Plate 7**
Palau
Sickle-spotted brown crow. Range: Palau. It is very common in Palau. The immature stages and hosts are unknown. The taxonomy of this species is disputed. According the Vane-Ackery this is a subspecies of *E. algea* unique to Palau.

***Euploea eleutho* (Latreille and Godart)** **Plate 7**
Guam, Rota, Alamagan, Anatahan
Marianas brown crow. Range: Originally described from Guam and found only in the Mariana Islands. In 1936 Swezey found only a few on Guam. None have been collected since 1946 in Guam or Rota, but it was collected in Alamagan and Anatahan in 1971, giving hope that the species is not yet extinct. Nothing is known about its immature stages or hosts. There is dispute among taxonomists as whether this is a true species. According the Vane-Ackery, it should be considered a subspecies of *E. algea.*

Euploea eunice **Godart** **Plate** 7
Marianas, Yap, Palau
Blue-branded king crow. Range: Micronesia to India. The larvae feed on a variety of species of *Ficus* including *F prolixa, F benjamina,* edible figs, and oleander. The pupae are extremely attractive, being shiny silver or gold in color with black stripes. They are frequently found hanging on the aerial roots of fig trees or on nearby vegetation or structures.

Nymphalidae

Dione vanillae L. **Plate 8**
Palau
Gulf fritillary. Range: Gulf states of USA to Argentina. Now also established in California, Hawaii and the Galapagos. Host plants include many species of Passiflora, all of which are introduced weeds of American origin in the Pacific area. The only record is a photograph taken in the Palau Entomology Collection. However the underside was not photographed, so identification cannot be confirmed. Gulf fritillaries have silver spots on the underside.

Hypolimnas anomala **(Wallace)** **Plate 8**
Marianas, Palau, Yap
Guardian or Malaysian eggfly. Range: Malaysia to Northern Australia. The host plant in Guam is *Pipturus argenteus* (Urticaceae), a small tree species which occurs primarily in limestone areas. The yellow eggs of this species are laid in a large cluster, and guarded by the female until they hatch. This guarding behavior by the female prevents small ants from eating the eggs before they hatch. Parental behavior of this sort is rare in the butterflies, being known only in this species. The larvae are gregarious in their early stages, but as they become larger and require more food, they spread out. They leave the plant to pupate. Large larvae are black with orange spines

covering the body. Smaller larvae have small, black spines and look greasy.

Hypolimnas bolina **(L.)** **Plate 8**
Carolines, Marianas, Marshalls Blue moon or common eggfly. Range: Madagascar, and southwards into New Zealand. This species is considered to be the most variable butterfly in the world. It is also the most widely distributed butterfly in the Pacific, occurring on all the high islands of Micronesia, on many atolls, and in much of Polynesia. It is polypha- gous, having many hosts in many different families of plants. On Guam we have reared it from *Pipturus argenteus* (Urticaceae) and from *Syndrella nodiflora* (Compositae). On Majuro, larvae were found to be abundant on *Wollastonia biflora* (Compositae). This species is recorded as taking part in migratory flights, including flights from Australia to New Zealand. The larvae look very similar to those of the guardian butterfly, but differ in have a diffuse brownish-orange stripe down each side. Younger larvae have orange spines rather than black, and do not look greasy. Eggs are green and laid singly or in small clusters.

Hypolimnas misippus **(L.)** **Plate 8**
Palau, Ulithi
Danaid eggfly. Range: Africa to Oriental Region and N. Australia, New Guinea, and in the West Indies where it is believed to have been carried in the slave trade. The male of this species resembles the male of *H. bolina* but the spots on their wings are more white than blue. The female is almost an exact replica of *Danaus chrysippus.* Its primary food plant is *Portulaca oleracea,* but other hosts are known.

Hypolimnas octocula **(Butler)** **Plate 9**
Guam, Saipan, Palau
Forest flicker. Range: New Caledonia and the Loyalty Islands and Vanuatu. Distinct subspecies occur in Palau and in the Marianas. On Guam, larvae have been reared on *Procris pedunculata* and *Elatostema calcareum* (both Urticaceae). The larvae are similar to those of *H. bolina* and *anomala,* but they maintain a black head through all instars, and their spines are more red than orange. This butterfly is a rare forest or forest clearing species. On Guam, it is not seen often, but can be found at Hilaan Point and other forested areas that have populations of its host. It may be extinct on Saipan. On Guam males and females are similar, but on Palau, the females are pale with large white spots along the margin of the front wing.

Hypolimnas pithoeka **Kirsh** **Plate 8**
Kosrae
Dark eggfly. The distribution of this species is known to include New Guinea and the Solomons.

Junonia hedonia **(L.)** **Plate 9**
Palau
Chocolate soldier. Range: Malaysia to the Solomon Islands. The larva is a dull, dark brown color.

Junonia villida **(F.)** **Plate 9**
Palau, Chuuk, Pohnpei, Marshalls

Meadow argus. Range: Australasian-Papuan region. In the Marshalls it has been collected in Bikini and Eniwetak. Known food plants in Australia are *Plantago, Centrarium australe,* snapdragons, *Convolvus valsinoides* and *Verbena.* The larvae are black with short branched spines, and two horns on head. They feed at night and spend the day in debris. The pupa is black mottled with pink or white. Although it is not currently found in the Marianas, an illustration made by the artists of the Freycinet expedition to Guam in 1819 shows a butterfly which appears to be this species.

***Phalanta* sp.** **Plate 9**

Palau

Leopard. This butterfly may be an undescribed species, so far only known from Palau. Others feel that there is only one variable species *Phalanta alcippe* found on various islands of the Western Pacific to Australia.

***Vagrans egista* (Cramer)** **Plate 9**

Palau

Vagrant. Range: India to the South Pacific Islands. It is a rapid flyer, which often returns to same spot. It is supposedly attracted to human sweat. Larvae are green or brown with black branched spines and horns on head, and a white line on either side of abdomen. In Australia, it feeds on *Flacourtia, Xylosma ovatum* and *Homalium circumpinnatum.*

Vagrans egistina **(Quoy)** **Plate 9**

Guam, Rota

Marianas rusty. The species was described from Guam and is con fined to the Marianas. Swezey found it rare but widespread on Guam in 1932. Despite extensive searches, none have been found in Guam recently, though several were collected in Guam in the early 1970s. It has also been collected recently in Rota. Swezey reared it from a small tree, *Maytenus thompsonii* (Celastraceae).

***Vanessa indica* (Herbst)** **Plate 9**

Palau

Indian red admiral. The species is widespread in Asia from India to the Philippines. *Neptis hylas guamensis* Swinhoe Guam?

Common sailor. Range: Asia: China to Sri Lanka to the Philippines. The wings are black with white stripes. Although the subspecies was described in 1916 from a specimen said to have been collected in Guam, it is possible that the specimen was erroneously labeled and was from elsewhere. Except for that single specimen, it has not been collected on Guam despite intensive searching.

Satyridae

Melanitis leda **(L.)** **Plate** 7

Marianas, Carolines

Evening brown. Range: Tropical Africa to the Bismarck Archipelago. The larvae feed on various species of grasses. On Guam we have found them on corn, Guinea grass and Napier grass. They also feed on rice, and are sometimes common enough to be considered pests. The larvae are

green with two black hair tufts on their head that look like horns. The low flying butterflies are active primarily at dawn and at dusk. Marianas specimens have brighter eye spots than those from the Caroline Islands.

Checklist of Micronesian Butterflies

	Palau	Yap	Marianas	Chuuk	Pohnpei	Kosrae	Marshal	Page	Plate
Hesperiidae									
Badamia	X		X				X	16	2
Erionota thrax			X					16	2
Hasora chromus	X		X				••*	16	2
Parnara naso	X						…	17	2
Taractrocera ziclea			X					17	2
Papilionidae									
Graphium	X							17	2
Papilio polytes	X		X					17	2
Papilio xuthus			X				X	18	3
Pieridae									
Appias ada	X							18	3
Appias paulina	X		X					18	3
Catopsilia pomona	X		X					19	4
Catopsilia pyranthe	X							19	3
Eurema blanda	X		X					19	4
Eurema brigitta	X							19	4
Eurema hecabe	X						?	20	4
Lycaenidae									
Acytolepis puspa	X							20	5
Bindahara phocides	X							20	5
Catochrysops amasea	X		X					20	5
Chilades pandava			X					21	5
Euchrysops cnejus	X							21	5
Everes lacturnus	X							21	5
Famegana alsulus.	X							21	5
Jamides bochus	X						X.	21	5
Lampides boeticus	X		X					22	6
Megisba strongyle	X		X					22	6
Nacaduba kurava	X							22	6
Nacaduba sp.	X							22	6
Petrelaea dana	**X**							22	6
Prosotas sp.	**X**							23	6
Syntarucus plinius	**X**		**.**					23	6
Zizina otis	**.**	**X**	**X**	**X**		**.**		23	6
Zizula hylax		**X**	**X**	**X**				23	6

	Palau	Yap	Marianas	Chuuk	Pohnpei	Kosrae	Marshal	Page	Plate
Danaidae									
Danaus affinis	**X**	**X**	**.**	**.**	**.**			23	7
Danaus plexippus	**X**	**X**	**X**	**X**	**X**	7	**X**	24	7
Euploea abjecta	**X**		**.**	**.**	**.**			24	7
Euploea eleutho	**.**		**X**					24	7
Euploea eunice	**X**	**X**	**X**					25	7
Nymphalidae									
Dione vanillae	**X**	**.**	**.**					25	8
Hypolimna sanomala	**X**	**X**	**X**					**25**	8
Hypolimnas bolina	**X**	**X**	**X**	**X**	**X**	**X**	**X**	25	8
Hypolimna smisippus	**X**	**X**[1]	**.**	**.**	**.**		**.**	26	8
Hypolimna soctocula	**X**	**.**	**X**					26	9
Hypolimn aspithoeka			**.**			**X**		27	8
Junonia hedonia	**X**							27	9
Junonia villida	**X**			**X**	**X**		**X**	27	9
Phalanta sp.	**X**							27	9
Vagrans egista	**X**					**.**		27	9
Vagrans egistina	**.**		**X**					28	9
Vanessa indica	**X**				**.**			28	9
Neptis hylas			72					28	
Satyridae									
Melanitis leda	**X**	**X**	**X**	**X**	**X**	**X**		28	7

[1] On Ulithi but not collected from Yap proper
[2] One specimen collected in 1895,but later thought to have been mislabeled and not actually in the Marianas.