A MONOGRAPH ON THE ISOPOD FAMILY AEGIDAE IN THE TROPICAL EASTERN PACIFIC I. THE GENUS *AEGA*

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The species *Aega spongiophila* Semper, is notable for making its home in the beautiful silicious sponge, *Euplectella aspergillum,* of the Philippines, in which it can scarcely be expected to live by sucking the juices of fish, but it is probably well supplied with food from the other crustaceans and small marine animals of various kinds which enter the glass-rope basket by accident or design, and find themselves entrapped within it in presence of a dangerous foe.

The Rev. Thomas R.R. Stebbing
A History of Crustacea, 1893

ABSTRACT

The flabelliferan isopod family Aegidae is rediagnosed and discussed. The genus *Aega* is redescribed and discussed including a review and key to the species of the eastern Pacific, and establishment of two new subgenera. *Aega micropthalma* Dana is relegated to the status of *species inquirenda; Aega tenuipes* Schioedte and Meinert and *Aega ecarinata* Richardson are probably West Atlantic, not Eastern Pacific species. The five species of *Aega* occurring in the tropical eastern Pacific are presented with complete descriptions and figures. *Aega excisa* Richardson, *Aega antillensis* Schioedte and Meinert, and *Aega schioedteana* Bovallius are reestablished as junior synonyms of *Aega deshaysiana* (H. Milne Edwards). *Aega magnoculis* Richardson is reestablished as the junior synonym of *Aega plebeia* Hansen. The genus *Rocinela* will be treated in a subsequent paper.

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INTRODUCTION

This is one in a series of regional monographic treatments on the marine isopods of the tropical eastern Pacific (the "Panamic Region" of Ekman, 1953; the "Eastern Pacific Zoogeographic Region" of Brusca and Wallerstein, 1979b). The family Idoteidae was treated by Brusca and Wallerstein (1977, 1979a), and the family Cymothoidae by Brusca (1981). The family Aegidae will be treated in two parts; the present paper monographs the genus *Aega* in the tropical eastern Pacific, the second paper will treat the genus *Rocinela* in this region.

Few studies have been undertaken on the Aegidae of the tropical eastern Pacific. The principal work was that of Hansen (1897), who reported on the U.S.S. "Albatross" expedition during 1891 to this region. Hansen's various publications on the cirolanoid Flabellifera represent some of the finest systematic work accomplished on this group. His study of the "Albatross" material was no exception, and in this endeavor he was assisted by two equally competent carcinologists of his era, F. Meinert and G. Budde-Lund. The collections from this expedition contained only 14 marine isopods, all of which were new to science. Of the 6 species of Aegidae named and described by Hansen (1897), all remain valid today (4 *Aega*, 2 *Rocinela*). My own research on this family, which includes not only my own collections but also a search of many of the world's largest museum collections, has been able to add only a single additional species of *Aega* to Hansen's list (although numerous new species of *Rocinela* await descriptions).

The first aegid to be described from the tropical eastern Pacific was *Rocinela aries* Schioedte and Meinert, 1879, now a junior synonym of the amphi-American *R. signata* Schioedte and Meinert, 1879. Richardson (1898) described *Rocinela tuberculosa* from collections made by the U.S.S. "Albatross" in the southern Gulf of California, and *R. angustata* (1904) from western Mexico and Japan. The latter is now the senior synonym of her *Rocinela laticauda* Richardson, 1898 (not Hansen's *R. laticauda* of 1897). She later (1914) reported on the isopods taken by the 1899-1900 expedition of the U.S.S. "Albatross" to the tropical eastern Pacific, listing both *R. signata* (as *R. aries*) and *R. angustata*. Bowman (1977) reported only one aegid (*R. signata*) from the 1938 "Presidential Cruise" to the tropical eastern Pacific. Brusca (1980) reported *R. tuberculosa* as occurring throughout the Gulf of California and southwest Baja California (Mexico).

METHODS AND MATERIALS

The specimens upon which this study is based were obtained from a variety of sources. The aegid holdings of the Allan Hancock Foundation constitute the core material and include my personal collections made over the past 10 years. In addition, considerable material was borrowed from other museums; these are listed below with their abbreviated designation as used in the text following. Primary types of all tropical eastern Pacific species (and many others) were examined.

AHF	Allan Hancock Foundation, University of Southern California, Los Angeles.
CAS	California Academy of Sciences, San Francisco.
MNHN	Muséum National d'Histoire Naturelle, Paris.
USNM	National Museum of Natural History
ZMO	Zoologisk Museum, University of Oslo, Oslo, Norway.
SIO	Scripps Institution of Oceanography, La Jolla, California.
ZMB	Zoologisches Museum, Humboldt University, German Democratic Republic (East Germany).

Methods and terminology are the same as in Brusca (1981). Plumose marginal setae are indicated in the species descriptions by the abbreviation PMS. Total body length/width ratios are provided in the "pereon" sections of the species descriptions. The generic and family diagnoses herein are expanded in comparison to those traditional in the literature. Based on my own examination of one-third of the known species of *Aega*, as well as a complete review of the literature, I have refined the generic and species boundaries as much as possible. Complete synonymies, geographic data and type depositions are provided for all species treated. The first reference cited following a specific name in the synonymy section is the author of that name, and is followed by a period. Subsequent published references to that name follow, separated by semicolons. Although the present monograph covers that warm-water (tropical and subtropical) region known as the Eastern Pacific Zoogeographic Region—the "Panamic Region" of some earlier authors—I have included a key to all known *Aega* from throughout the eastern Pacific (Alaska to Tierra del Fuego). This key was constructed from examination of all 10 species known to occur in this region.

SYSTEMATIC SECTION

Family Aegidae Dana, 1853*

DIAGNOSIS. Body cirolanid-like; dorsum evenly vaulted or quite depressed; smooth. Coxal plates distinct on pereonites II-VII; those of pereonite I fused with their somite. Eyes, when present, usually large, not uncommonly nearly contiguous (entirely contiguous in a few species). Both antennae well developed; division between peduncle and flagellum distinct; flagellum multiarticulate. Antenna 1 shorter than antenna 2, the former with 3 peduncular articles, the latter with 5. Maxilla 1 slender and styliform, with apical spines. Maxilla 2 broader, terminating in 2 usually distinctly unequal lobes with apical spines. Maxillipedal palp of 2, 3, or 5 articles; terminal articles with spines and/or stout setae. Mandible without lacinia mobilis, spine row, or molar process; palp of 3 articles. Pereopods I-III prehensile (i.e. dactyls generally as long as, or longer than propi and strongly curved); pereopods IV-VII ambulatory (i.e. dactyls shorter than propi). Pleon with 4-5 free pleonites, plus pleotelson. Uropods flattened, forming a "tail fan" with the pleotelson. Pleopods bilamellate, with plumose marginal setae.

REMARKS. Aegids are some of the largest known isopods, attaining lengths to at least 60 mm (e.g. *Aega crenulata* Lutken, *Rocinela danmoniensis* Leach), and are well known to Norwegian fishermen for this reason, at least in times past, who referred to them as "Fisk-Bjørn," or "fish bears." Species in this family have long been referred to as "parasites" (e.g. Sars, 1897; Hale, 1929; Schultz, 1969). However, because they apparently attach to a "host fish" only long enough to feed, thereupon resuming their free-living existence, because no "host" specificity is known for any species, because they have also been reported as "scavengers," and finally because they are most often captured free living on the ocean bottom (often in large numbers) Brusca (1980, 1981) more appropriately considered them "carnivorous scavengers and micropredators." Some aegids may be associated fairly regularly with groups of specific species of fishes in given localities (Bruce, pers. comm.). In these cases, however, there is no evidence that ecological host specificity exists or that the isopods are not also found on other prey fish species elsewhere. Such cases are probably opportunistic association, mediated by geographic coincidence. I have found, for example, that *Rocinela cornuta* Richardson is very common in the Gulf of Alaska and in surveys made by AHF personnel in that region (1975-76) nearly every benthic sample contained numerous specimens of only this species of aegid. One of the most interesting of the aegids, *Aega spongicola* Semper, makes its home in the glass sponge *Euplectella aspergillum* of the Philippine Islands region (Stebbing, 1893). Certainly one must suspect this species to be a scavenger, rather than a parasite. Aegids do not form persisting symbiotic relationships with a host, and consideration of these isopods as "micropredators" rather than parasites is in agreement with modern definitions of "parasite" and "predator." Menzies *et al.* (1955) and Brusca (1981) have discussed the position of the Aegidae in a phylogenetic trend leading from free-living cirolanids to the truly parasitic family Cymothoidae.

The maxillipeds of aegids consist of a 2- or 5-articulate palp attached to an elongate basis; the basis rests upon a minute divided coxa (see Fig. 8d). However, the coxa is rarely removed with the maxilliped and most published figures of these appendages omit these small articles. A true epignath (= exite) is wanting in Aegids. In females bearing oostegites, the articles of the maxilliped are expanded and the basis bears a large, thin, lamellar plate which for all intents and purposes resembles another (small) oostegite (see Fig. 2h). Gravid females also have plumose marginal setae in place of the typical recurved spines seen on the maxillipeds of males and nongravid females. These same morphological peculiarities are present in the closely related Corallanidae and at least some, if not all, Cymothoidae (see p. 119 and Fig. 12F in Brusca, 1981). The transition from a normal maxilliped in non-ovigerous females, to the expanded, plate-bearing maxilliped in oostegiate-bearing females has not been addressed at any length in the literature. However, Hale (1929) suggested these expanded appendages might be used to fan a current of water through the marsupium. Stebbing (1893) and several subsequent authors have pointed out that this appendage, as well as the anterior oostegites, almost completely cover the buccal field, making it impossible for such individuals to feed. Ovigerous females have never been taken on a fish and are, in fact, rare in museum collections.

The oral parts together have been said to form a "sucking tube" (Hale, 1925), and according to Hansen (1890) and others the maxillipeds, with their outwardly projecting spines, are probably used to pull apart the skin of the prey, the mandibles to tear out pieces of flesh, and the style-like first maxillae to deepen and lacerate the wound (in males and non-ovigerous females). Hale (1925) pointed out, "Ingested food solidifies in specimens preserved in alcohol and, removed in this condition, provides a cast of the inside of the capacious stomach. In Europe these dark-brown or black masses [presumably

coagulated blood] were at one time regarded by superstitious fishermen and others as 'lucky stones,' or 'Peter's stones'; the stomach contents of *Aega psora* are said to have been used in the preparation of a salve, hence the popular name 'salve-bug' was formerly applied to this species; further, medical men prescribed the substance as an antidote to sea-sickness and other ills." Hansen (1897) noted that "In specimens of Aeginae taken on fishes, the ventral side of the thorax is often, nay almost generally, vaulted, and sometimes very considerably so, owing to the fact that the alimentary canal is greatly distended by blood sucked from the host; another result of this swollen condition is that the segments of the thorax very often become drawn out from each other." I have observed the above described conditions in numerous specimens and together they support the hypothesis that aegids feed infrequently, gorging themselves when they do so, and that gravid females are non-feeding.

Schioedte and Meinert (1879) synonymized the genera *Pterelas* Guérin and *Aegacylla* Dana with *Aega* Leach. Sars (1897) synonymized *Harponyx* Sars and *Rocinela* (of Bovallius, not of Leach) with *Syscenus* Harger. Thus, there are presently 5 genera recognized: *Aega* Leach, 1815 (about 66 species); *Rocinela* Leach, 1815 (about 35 species); *Syscenus* Harger, 1878 (4 species); *Barybrotes* Schioedte and Meinert, 1879 (1 species; originally given familial status); and *Alitropus* Milne Edwards, 1840 (1 species). Seventy-five percent of the valid species of Aegidae were described before the turn of the century, most from single specimens. These facts, combined with the numerous shuffling of some species back and forth between genera (as well as the creation of several major homonymies) have created a chaotic taxonomic history for the family.

Only *Aega* and *Rocinela* are known from the eastern Pacific tropics, although *Syscenus peruanus* Menzies and George, 1972, was reported from the abyssal environment of the Peru-Chile Trench.

KEY TO THE GENERA OF AEGIDAE KNOWN FROM THE EASTERN PACIFIC

1a Pleon abruptly narrower than pereon; maxillipedal palp of 2 articles; peduncular articles of antenna 1 not expanded; mandibular palp with proximal (first) article longer than middle (second) article ..... *Syscenus*

1b Pleon not abruptly narrower than pereon; maxillipedal palp of 2 *or* 5 articles; peduncular articles of antenna 1 weakly or strongly expanded; mandibular palp with proximal (first) article shorter *or* longer than middle (second) article 2

2a Maxillipedal palp of 2 or 3 articles; peduncular articles of antenna one not greatly expanded; frontal lamina small, narrow, and indistinct; mandibular palp with proximal (first) article elongate, usually longer than middle article ..... *Rocinela*

2b Maxillipedal palp of 5 articles; peduncular articles of antenna one moderately to strongly expanded; frontal lamina large, broad and distinct; mandibular palp with proximal article distinctly shorter than middle article ..... *Aega*

Aega Leach, 1815

DIAGNOSIS. Body compact; pleon not much narrower than pereon and tapering gradually posteriorward, although pleonite 5 often manifestly narrower than pleonite 4. Pleon of 4-5 pleonites, plus pleotelson. Eyes present, large, often nearly or even entirely contiguous. Anterior margin of cephalon entire, or produced into a short acute process that often forms a rostrum folding ventrally to separate the first antennae to varying degrees. Frontal lamina large, broad and distinct, separating second antennae; shield-shaped, triangular, or ovate; often raised on a pedicle. Antenna 1 short, with first 2 articles (of peduncle) often dilated; second article may extend distally as a gradual process in some species. Antenna 2 short or long, but never extended beyond pereonite V; second article in most species more-or-less divided longitudinally into 2 pieces. Maxillipedal palp of 5 articles; terminal article very small and with long stout setae, or with recurved spines; pentultimate article always with stout recurved spines; remaining articles with or without spines; spines outwardly (laterally) directed for the most part. Maxillae 1 with stout apical spines, and often subapical spines. Maxillae 2 with 2, usually unequal lobes, both with stout recurved spines. Mandibular palp with middle article elongate; distal region of middle article only rarely expanded. Paragnath of 2 small lanceolate lappets. Coxal plates large, distinct, sculptured laterally with distinct or indistinct oblique ridges; produced posteriorly into subacute or acute angles. Penes of male minute. Pereopods I-III with propi expanded distally into spine-bearing lobe, or not expanded. Pereopods IV-VII with numerous marginal and apical spines on most articles; propi never expanded as on I-III. Pleopods with plumose marginal setae (PMS), decreasing in number on posterior rami; pleopod 5 usually lacking coupling hooks on peduncle; peduncle of first pleopods divided into 2 pieces in most species; peduncle of second pleopod often incompletely divided.

TYPE-SPECIES. *Aega psora* (Linn., 1761). Synonyms: *Oniscus psora* Linn., 1758; *Aega emarginata* Leach, 1815.

REMARKS. About 66 valid species of *Aega* currently exist. I have examined specimens of 22 of these, including primary types of 12 species. Thirteen species of *Aega* have now been reported from the entire eastern Pacific (see Table I). Two of these records are probably in error (*Aega ecarinata* and *Aega tenuipes*), and one (*Aega micropthalma*) is herein relegated to the status of *species inquirenda. Aega alaskensis* Lockington, 1877 was removed to *Rocinela* by Richardson (1898a). *Aega punctulata,* reported by Miers (1881) from the H.M.S. "Alert" Expedition to Patagonia and the Strait of Magellan, has not been reported since the original brief description.

Aega micropthalma Dana, 1854 was originally described from California, the type being said to have been collected by John L. LeConte. Dana provided no data as to when or where in California the (presumably) single specimen was taken. Stimpson (1857) apparently examined Dana's type and some additional specimens, but it isn't clear that these other specimens were in fact *A. micropthalma,* as Stimpson states, "The specimens to which the above description approximate somewhat, in the character of the anterior thoracic feet, to the genus *Cirolana,* and, although probably only a variety of *Aega micropthalama,* may perhaps provide distinct, in which case I would propose for them the name *Cirolana pubescens.*" Stimpson's description differs in several regards from Dana's original and it is impossible to draw any definite conclusions from it. Richardson (1905a) repeated Dana's original description, giving no indication that she examined either the type or any additional material. The description is of little use owing to its brevity and generality. Richardson (1899) provided notice of two additional critical features of *A. micropthalma.* These are the absence of a process on the second article of antenna 1, and an evenly convex margin on the pleotelson. This at least allows this nominate species to be placed in its proper subgenus (see below). Although *Aega micropthalma* has never been illustrated, its most distinctive and unusual features are the alleged small eyes, and pleon comprised of only 3 free pleonites plus the pleotelson. No other species in the family Aegidae is known to have a pleon of fewer than 4 free pleonites. Based on the above, I suspect that Dana's specimen was either a juvenile *Aega symmetrica,* or a *Cirolana harfordi* (Lockington, 1877). In either case, the first 1 or 2 pleonites may have simply been hidden under pereonite VII. Other isopods described, collected or transmitted by James Dana and John LeConte have created similar problems for modern biologists (e.g. see Thun and Brusca, 1980, for a discussion of the field work of these men). As I have been unable to locate either the type or any other specimens that can be identified as *Aega micropthalma,* I herein relegate this species to the status of *species inquirenda.*

Aega tenuipes is one of several aegids originally described by Schioedte and Meinert (1879) from Cuba, and later reported from the northeast coast of South America (Monod, 1969). This species has never been collected in Pacific waters to my knowledge. It first appeared in the literature with a Pacific record in Schultz (1969) who reported it [in error] from "Mid- to southern California." Miller (1975) apparently perpetuated Schultz's *lapsus.* I have compared the two co-types of *A. tenuipes* with the description and figures provided by Monod (1969), as well as additional material from the west Atlantic region. It appears that young individuals have the eyes clearly separated by a short distance, whereas larger specimens have the eyes essentially contiguous.

Aega ecarinata Richardson, 1898b is a Gulf of Mexico-Caribbean species. It first appeared in the Pacific literature when Coventry (1944) reported it off Acapulco, Mexico from the Fifth George Vanderbilt Expedition of 1941. Coventry provided no description or figure of his alleged specimen, and I have been unable to locate it in my search of museum collections. As no further records or specimens of this species have appeared since Coventry's report, and as Coventry was not a specialist in the Isopoda, I presume the identification or the record to be in error. The Fifth George Vanderbilt Expedition also collected in the Caribbean; the specimen could have been taken there and subsequently incorrectly labeled.

Two-thirds of the species of *Aega* in the world literature were described prior to the turn of the century, and are in need of redescription. Fortunately, species of *Aega* are generally easily distinguished from one another (in contrast to, for example, species of the closely related family Cymothoidae). Characters that I have found to be especially reliable in species recognition of *Aega* are as follows: nature of peduncular articles of first and second antennae; length of cephalic process or rostrum; spine formulas of mouth appendages; morphology of pereopods and pleopods; shape of uropodal endopod; length of uropods relative to pleotelson; shape of pleotelson margin; size of eyes. Unfortunately, many of these structures were not described in the older literature, and in fact often not in the recent literature! The first five of the above "characters" take on consistent patterns within what appears to be two distinct and separate lineages, herein designated and described as subgenera (see below). The spines of the pleotelson and uropodal rami margins are fragile and often missing in older preserved

Table I.

Distribution and Taxonomic Status of the Species of *Aega* Reported or Now Known from the Entire Eastern Pacific.

DISTRIBUTION

Species	N.E. Temperate	Tropical	S.E. Temperate (Chile)	Circumtropical	Remarks
Aega (*Aega* n. sgen.)					
A. deshaysiana				X	Herein synonymized with *A. antillensis* and *A. excisa* (see text)
A. acuminata		X			
A. maxima		X			
A. lecontii	X				
A. semicarinata			X		See Menzies, 1962
A. magnifica			X		See Menzies, 1962
A. ecarinata					Pacific record (Coventry, 1944) in error; a west Atlantic species.
Aega (*Rhamphion* n. sgen.)					
A. plebeia		X			
A. longicornis		X			
A. perulis			X		See Menzies and George, 1972
A. micropthalma	X				Herein relegated to status of *Species Inquirenda.*
A. tenuipes					Pacific "records" (Schultz, 1969; Miller, 1972) are in error; a west Atlantic species.
A. symmetrica	X				

specimens. Infraspecific variation appears to be great only in widespread species (e.g. *A. deshaysiana*). A few clarifying remarks on the above characters follow.

First antennae: While the peduncular articles of the aegid first antennae are always large and clearly distinguished from the flagellar articles, the first 2 articles in some *Aega* may be greatly expanded. In the latter case, the second article extends distally as a gradual process ⅓ to ½ the distance into the third article. The third article is never so markedly enlarged.

Second antennae: In most species of *Aega,* the second peduncular article is more-or-less longitudinally divided into 2 separate pieces. The upper piece is generally the larger, while the smaller lower piece may be produced distally into a short process.

Cephalic Process or Rostrum: The frontal margin of *Aega* species is usually developed into a short acute process, or into a longer process that warrants being termed a rostrum. In the first case, the cephalic process is extended only ⅓ to ½ the distance between the basal articles of antennae 1, thus failing to reach the frontal lamina. In the second case, the rostrum extends the full length of the basal articles of antennae 1, separating them entirely and meeting with the upper (anterior) margin of the frontal lamina.

Maxillipedal Palp: The 5-jointed palp may bear stout recurved spines on any or all of the distal 4 articles. The terminal article either bears stout spines, or does not bear spines; in the latter case, it has long, stout, straight, simple "setae" instead. The fifth (terminal) article of the palp in this genus is quite small and twisted 90° so as to make it difficult to distinguish from the pentultimate article. This has led to the poor practice of illustrating the palps with only 4 articles (the last two being drawn as one) by some workers (*e.g.* Hale, 1925; Menzies, 1962; Monod, 1969). Menzies (1967) states, "Only 4 articles are shown on the maxillipeds of the species illustrated here. This is due to the fact that the small terminal article is obscured from view because of the peculiar twisting undergone by the maxillipedal palps of species belonging to this genus." Hale (1925) stated, "Owing to the curve of the maxilliped in males and non-ovigerous females, it is not always possible to show all five segments of the palp in illustrations." This, of course, is not so; by flattening the palp beneath a cover slip it can be artificially straightened and illustrations in the present paper were done by this technique (and are hence somewhat "diagrammatic").

First Maxilla: The apex of the first maxilla bears a number of stout, somewhat recurved spines. These spines may be restricted to the apex, or they may also extend downward to form a subapical row.

Second Maxilla: The two lobes of the second maxillae bear a number of stout recurved spines, the number on each lobe being fairly consistent within a species, rarely varying by more than one spine.

Mandible: The 3-jointed palp of the mandible has the middle article distally expanded into a spine-bearing lobe in a few species. Aside from this, the mandibles of *Aega* are remarkably similar and difficult to illustrate owing to their 3-dimensionality; they appear to be of little taxonomic value within the genus.

Pereopods: The first 3 pairs of legs may or may not have the propi expanded distally into a large spine-bearing lobe. The lobe may be very small and bear setae and/or spines; or the lobe may be reduced to a stubby flattened plate bearing spines and/or setae; or the lobe may be absent altogether. Presence or absence of this lobe has been used in the past to distinguish *Aega* from the genus *Rocinela*. In fact, in both genera the lobe may be present or absent.

The distribution of the characters and their states discussed above, for the two subgenera herein proposed, are provided in the subgeneric diagnoses below. It can be seen that the expanded peduncular articles of the first antennae are always associated with the absence of a distinct rostrum and the presence of recurved spines on the apex of the maxillipedal palp (as well as other characters). Whether these anatomical features are related to one another in a functional or developmental way is not known (*e.g.* does the presence of expanded peduncular articles on antennae one prohibit the development of a rostrum?) Subgeneric assignment has been based on direct examination of 23 species (about ⅓ of the known *Aega*), and use of the literature for an additional 30 species; thus 53 species are herein assigned (80 percent of the recognized valid species). In the species lists that follow, binomens of commonly used junior synonyms are given below their senior synonym.

Subgenus *Aega* n. subgen.

DIAGNOSIS. Antenna 1 with peduncular articles 1 and 2 greatly expanded or dilated; article 2 extended distally in the form of a gradual process reaching at least ¼ to ½ distance into article 3. Antenna 2 short, reaching posterior margin of pereonite II at most. Cephalon lacking a true rostrum, although frontal margin may be produced forwards as a short acute process that extends ⅓ to ½ distance between bases of antennae 1; apex of cephalic process falls considerably short of frontal lamina. In dorsal aspect, frontal margin of cephalon appears evenly convex or subacute. Terminal article of maxillipedal palp with stout, recurved spines. Maxilla 1 with subapical spines, as well as apical spines. Pereopods I-III with propus usually expanded distally into a lobe; size of lobe varies from very small to very large, rarely absent altogether (it is absent in *A. lecontii*); lobe with or without stout spines. Uropodal endopods often falcate; may also be triangulate or subquadrate. Pleopods 1-2 tend towards quadrate shape.

TYPE-SPECIES. *Aega psora* (Linn., 1761).

SPECIES ASSIGNED TO *Aega (Aega)*.

Aega (Aega) acuminata Hansen, 1897
**Aega (Aega) angustata* Whitelegge, 1901
**Aega (Aega) antennata* Richardson, 1910
**Aega (Aega) bicavata* Nordenstam, 1932

***Subgeneric assignment based on literature; all others from examination of actual specimens (usually types).**

Aega (Aega)chelipous Barnard, 1960
Aega (Aega) concinna Hale, 1940
Aega (Aega) crenulata Lutken, 1859
Aega (Aega) deshaysiana (H. Milne Edwards, 1840)
(=*A. antillensis* Schioedte and Meinert, 1879)
(=*A. excisa* Richardson, 1910)
Aega (Aega) dofleini Thielemann, 1910
Aega (Aega) ecarinata Richardson, 1898
Aega (Aega) falklandica Kussakin, 1967
Aega (Aega) hirsuta Schioedte and Meinert, 1879
Aega (Aega) lecontii (Dana, 1854)
Aega (Aega) magnifica (Dana, 1853)
Aega (Aega) meinerti Miers, 1884
Aega (Aega) maxima Hansen, 1897
Aega (Aega) monophthalma Johnston, 1834
Aega (Aega) punctulata Miers, 1881
Aega (Aega) rosacea (Risso, 1816)
(=*A. bicarinata* Leach, 1818)
Aega (Aega) semicarinata Miers, 1875
Aega (Aega) serripes (H. Milne Edwards, 1840)
Aega (Aega) tridens Leach, 1815
Aega (Aega) truncata Richardson, 1910
Aega (Aega) webbi (Guerin, 1835)

Subgenus *Rhamphion* n. subgen.

DIAGNOSIS. Antenna 1 with peduncular articles 1 and 2 normal, not overly inflated or dilated; article 2 without a distal process. Antenna 2 long, extended at least to pereonite II, usually to pereonite IV or V. Cephalic process long, forming a short rostrum, produced forward and ventrally to entirely separate bases of first antennae, and meet with upper margin of frontal lamina. In dorsal aspect, frontal margin of cephalon appears more-or-less truncate. Terminal article of maxillipedal palp with long, stout, simple, setae, but rarely recurved spines. Maxilla one generally without subapical spines; with apical spines only. Pereopods I-III without expanded distal lobe on propus; at most with a flat, spine-bearing plate. Uropodal endopods never falcate; acutely ovate in outline. Pleopods 1-2 tend towards an ovate shape.

ETYMOLOGY. The name *"Rhamphion"* is the diminutive of the Greek "Rhamphos," meaning a curved beak; in reference to the distinct rostrum present in species of this subgenus.

TYPE SPECIES. *Aega plebeia* Hansen, 1897.

SPECIES ASSIGNED TO *Aega (Rhamphion).*
Aega (Rhamphion) acuticauda Richardson, 1910
Aega (Rhamphion) arctica Lutken, 1859
Aega (Rhamphion) australis Whitelegge, 1901
[not *A. australis* of Richardson, 1906]
Aega (Rhamphion) cyclops Haswell, 1881
Aega (Rhamphion) dentata Schioedte and Meinert, 1879
Aega (Rhamphion) koltuni Kussakin, 1967
Aega (Rhamphion) fracta Hale, 1940
Aega (Rhamphion) glacialis Tattersall, 1921
Aega (Rhamphion) gracilipes Hansen, 1895
Aega (Rhamphion) incisa Schioedte and Meinert, 1879
Aega (Rhamphion) laevis (Studer, 1883)
Aega (Rhamphion) longicornis Hansen, 1897
Aega (Rhamphion) megalops Norman, 1904
Aega (Rhamphion) micropthalma Dana, 1854 [*species inquirenda*]
Aega (Rhamphion) monilis Barnard, 1914
Aega (Rhamphion) neozelandia Dana, 1853

***Subgeneric assignment based on literature; all others from examination of actual specimens (usually types).**

**Aega (Rhamphion) nodosa* Schioedte and Meinert, 1879
Aega (Rhamphion) perulis Menzies and George, 1972
**Aega (Rhamphion) quadratasinus* Richardson, 1903
**Aega (Rhamphion) spongiophila* Semper, 1867
Aega (Rhamphion) strömii Lutken, 1859
(=*A. bicarinata* Rathke, 1837)
(=*A. monopthalma* Johnston, 1834, in part)
Aega (Rhamphion) symmetrica Richardson, 1905
**Aega (Ramphion) synopthalma* Richardson, 1909
Aega (Rhamphion) tenuipes Schioedte and Meinert, 1879
**Aega (Rhamphion) uschakovi* Kussakin, 1967
Aega (Rhamphion) ventrosa M. Sars, 1859
Aega (Rhamphion) vigilans (Haswell, 1881)
(=*A. dubia* Richardson, 1910)
=A. ommatophylax Stebbing

Key to the Species of *Aega* of the Eastern Pacific

1a Antenna 1 with peduncular articles 1 and 2 greatly expanded, article 2 with a gradual distal process reaching at least ¼-½ distance into article 3; cephalon with or without a short acute cephalic process, but never with a true rostrum; cephalic process never completely bisects bases of antennae one, nor reaches frontal lamina; terminal article of maxillipedal palp with stout, somewhat recurved spines; antennae 2 short, never extended beyond pereonite II (Subgenus *Aega*) 2

1b Antenna 1 with peduncular articles normal, without distal process on second article; cephalon with a distinct ventrally-directed rostrum, completely bisecting bases of antennae 1 to reach frontal lamina;terminal article of maxillipedal palp usually without spines, but with long, stout, simple setae; antennae 2 long, extended at least to pereonite II, usually to IV or V (Subgenus *Ramphion*) 7

2a Propus of pereopod I with large, apical, spoon-shaped process, truncate distally and lacking stout apical spines; posterior margin of pleotelson distinctly acuminate ..... *A. (Aega) magnifica*

2b Propus of pereopod I not as above, at best with a small spine-bearing process; posterior margin of pleotelson concave, evenly convex, or acuminate 3

3a Posterior margin of pleotelson concave; pereopod II with a large lobe-like seta at juncture of propus and dactyl; uropods extended barely to, or falling short of posterior margin of pleotelson ..... *A. (Aega) semicarinata*

3b Posterior margin of pleotelson never concave; peropods II not as above; uropods extended to, or beyond posterior margin of pleotelson 4

4a First antennae with articles 1 and 2 of peduncle enormously expanded, forming an anteriorly directed "self" off front of cephalon; antenna 1 with process of second article extending to distal margin of third article; flagellum of antenna 1 with fewer than 10 articles; maxilla 2 with less than 3 apical spines on small lobe ..... *A. (Aega) lecontii*

4b First antennae not as above; antenna 1 with process of second article extending at most ½ distance into third article; flagellum of antenna 1 with more than 15 articles; maxilla 2 with 3 or more apical spines on small lobe 5

5a Uropodal endopods with deep medial notch; pleopodal endopods 1-2 with quadrate proximal lobe; subapical spines of first maxillae "fishhook"-shaped ..... *A. (Aega) deshaysiana*

5b Uropodal endopods without medial notch; pleopodal endopods 1-2 without quadrate proximal lobe; subapical spines of first maxillae not "fishhook"-shaped 6

6a Posterior margin of pleotelson strongly acuminate; cephalon width equals 2-3 times length; middle article of mandibular palp expanded into large apical lobe; middle article of maxillipedal palp with 4 spines; maxilla 1 with 5 apical and 3 subapical spines; maxilla 2, small lobe with 2 stout recurved spines and 2 stout simple setae ..... *A. (Aega) acuminata*

6b Posterior margin of pleotelson evenly convex or only weakly acuminate; cephalon very short, width equals 4 times length; middle article of mandibular palp not expanded into apical lobe; middle article of maxillipedal palp with 5-6 spines; maxilla 1 with 3 apical and 4 subapical spines; maxilla 2, both lobes with 4 stout spines ..... *A. (Aega) maxima*

7a Pleon of only 3 (4?) pleonites (plus the pleotelson); eyes small, separated by distance much greater than width of one eye ..... *A. (Rhamphion) micropthalma (species inquirenda)*

7b Pleon of 5 pleonites (plus the pleotelson); eyes moderate to large 8

***Subgeneric assignment based on literature; all others from examination of actual specimens (usually types).**

8a Posterior margin of pleotelson evenly convex or subtruncate; inner margin of propus of pereopod I with 2-3 stout spines; appendix masculinum of male very long, extending beyond apex of pleopodal rami; maxilla 1 with more than 7 apical spines ..... *A. (Rhamphion) symmetrica*

8b Posterior margin of pleotelson acuminate to subacuminate; inner margin of propus of pereopod I with a single stout spine; appendix masculinum of male shorter, not extending beyond apex of pleopodal rami; maxilla 1 with less than 6 apical spines 9

9a Antennae 2 extended to pereonite V, with more than 20 flagellar articles; antennae 2 flagellar articles with rows or patches of submarginal setae; antennae 1 with fewer than 20 flagellar articles; maxilla 1 with 5 apical spines ..... *A. (Rhamphion) longicornis*

9b Antennae 2 extended to pereonite III, with fewer than 20 flagellar articles; antennae 2 flagellar articles with marginal setae only; antennae 1 with more than 20 flagellar articles; maxilla 1 with 3-5 apical spines 10

10a Uropods reach well beyond posterior margin of pleotelson; antennae 1 with less than 15 flagellar articles; eyes small, separated by distance equal to or greater than width of one eye; antennae 2 with less than 16 flagellar articles; posterior margin of pleotelson subacuminate ..... *A. (Rhamphion) perulis*

10b Uropods extended just to, or barely beyond posterior margin of pleotelson; antennae 1 with more than 15 flagellar articles; eyes large, separated by a distance less than width of one eye; antennae 2 with more than 16 flagellar articles; posterior margin of pleotelson clearly acuminate ..... *A. (Rhamphion) plebeia*

AEGA OF THE TROPICAL EASTERN PACIFIC

Aega (Aega) deshaysiana (H. Milne Edwards, 1840)
Figs. 1d, e, f, 2, 3

Rocinela deshaysiana H. Milne Edwards, 1840: 243. Heller, 1866: 22; Studer, 1883:22.

Aega deshaysiana Schioedte and Meinert, 1879: 360; Norman, 1904: 434; Richardson, 1904a: 29; 1904b: 674; 1906: 821; Nierstrasz, 1918: 107; 1931: 182; Hale, 1940: 295; 1952: 27; Siversten and Holthuis, 1980: 33.

Aega excisa Richardson, 1910: 11.

Aega antillensis Schioedte and Meinert, 1879: 361. Richardson, 1901: 521; 1905: 170; Thielemann, 1910: 26; Hale, 1925: 176; 1929: 254; 1940: 295; Barnard, 1925: 389; Menzies and Frankenberg, 1966: 5; Schultz, 1969: 189; Kensley, 1975: 39; 1976: 290; 1978: 57; Moreira and Sadowsky, 1978: 99, 108.

Aega schioedteana Bovallius, 1885: 5. Stebbing, 1893: 348.

DESCRIPTION.

Cephalon: Cephalon wider than long, width 2.5-3.0 times length. Eyes large; well pigmented; nearly contiguous with adjacent borders parallel, or entirely contiguous. Frontal margin acute to subacute, with weak to pronounced concavity on either side of cephalic process. Frontal lamina large, shield-shaped. Antenna 1 with proximal 2 articles of peduncle inflated; article 2 with only weak distal process; article 3 normal; flagellum of about 8 articles, first very short, second very long, remaining articles subequal. Antenna 2 with subacuminate distal margins on peduncular articles; article two divided longitudinally into 2 pieces; flagellum of about 10 articles, not reaching beyond posterior margin of first pereonite. Maxillipedal palp with proximal article short, second article triangular; no articles produced into distinct distal lobes; terminal article not immersed in pentultimate article; terminal article with 4-6 spines; pentultimate article with 3-4 spines; middle article with 4-5 spines; second article with 2-3 spines (see Table II). Maxilla 1 with 3-4 apical spines, 3-4 subapical marginal spines, and occasionally 1 subapical medial spine; apical and subapical medial spines typically stout, weakly recurved; subapical marginal spines with unique "fishhook"-like appearance. Maxilla 2 with 3-4 stout spines on large lobe, and 3-4 stout spines on small lobe; middle spine on small lobe formed from apex of lobe itself. Mandible simple; incisor with apex approximating spine-like shape in some specimens; distal article of palp with PMS; middle article of palp not forming apical lobe, but with 3 stout straight distal spines.

Pereon: Total body length equals 2.9-3.3 times width; one specimen from eastern Pacific considerably broader, length equals 2.6 times width; pereonites IV-V widest and longest. Coxal plates visible in dorsal aspect on pereonites III or IV to VII; all with acute distolateral angles; III-VII extended beyond posterior margin of respective pereonites. Pereopod I propus with apical lobe varying in size from

Table II.

Morphological Comparison of 8 Specimens of *Aega deshaysiana* from Various Geographic Localities

Specimen identification and sex	Collection locality	Pereopod I: No. spines on margin of merus	Pereopod I: Size of apical process on propus	Pereopod IV/VII: No. of spine "sets" on: ischium	merus	carpus	Maxilliped[1] formula	Max. 1[2] formula	Max. 2[3] formula
A. deshaysiana Holotype ♂	Mediterranean	3	minute	3/3	2/2	2/1	4-4-5-2-0	3 (+1) 3	4-3
A. antillensis Holotype ♀	Cuba	3	modest	3/-	2/-	2/-	5-4-4-2-0	3 (+1) 2-3	4-3
A. excisa Holotype ♀	Philippines	4	modest	3/4	2/3	2/3	(see footnote #4)	4-4	4-4
USNM No. 97891 ♀	Gulf of Mexico	3	large	3/4	2/2	2/2	4-4-5-3-0	3 (+1) 3	4-3
USNM No. 9564 ♀	Gulf of Mexico	3	large	4/4	2/2	2/-	6-4-5-3-0	3 (+1) 3	3-3
USNM No. 28974 ♀	Hawaii	left = 6 right = 5	modest	3/3	2/2	2/2	4-3-5-2-0	3 3	3-3
USNM No. 22687 ♀	Japan	5	modest	3/3-4	2/2	2/-	6-3-4-2-0	3 (+1) 3	4-3
AHF ♂	Eastern Pacific (Cocos Is.)	3	modest	3/3	2/1	1/1	4-5-5-3-0	3 (+1) 3	3-3

[1]Maxillipedal formula lists the numbers of spines on each of the 5 palp articles, beginning with the apical article.
[2]Maxilla 1 formula lists number of apical spines first (plus presence of a subapical medial spine indicated by "+1"), and number of subapical marginal spines second (below first number).
[3]Maxilla 2 formula lists number of spines on large lobe first; small lobe second.
[4]The holotype of *A. excisa* is a female with oostegites; it lacks spines on the maxilliped.

barely distinguishable to quite large, larger in females than in males; merus with 3-6 spines on inner margin (see Table II). Pereopod IV with 3-4 sets of marginal spines on ischium, 2 sets on merus, and 1-2 sets on carpus (see Table II). Pereopod VII with 3-4 sets of marginal spines on ischium, 1-3 sets on merus, and 1-3 sets on carpus (see Table II).

Pleon: Pleonites subequal in width, or tapering gradually posteriorly; subequal in length, although pleonite 5 may be somewhat longer due to cleft on posterior border of pleonite 4. Pleonite 1 not manifestly covered by pereonite VII. Posterior margin of pleotelson acuminate. Uropods extended to posterior border of pleotelson; inner angle of peduncle expanded and subacute; exopod ovate with subacute apex; endopod with deep notch or cleft on its outer margin; both rami with small marginal spines as figured (note spines missing from exopod of Holotype, Fig. 3d); PMS seen only on endopod and inner margin of peduncle. Pleopods with PMS as figured; pleopods 1-4 peduncles with coupling spines; endopods of pleopods 1-2 with distinct squared-off proximal lobe; pleopods 2-5 endopods with apical notch and process; pleopod 1 peduncles divided; pleopods 3-5 subsimilar; pleopod 5 with deep incision on lateral margins of exopod, and with proximal accessory lamella on endopod; appendix masculina simple, as figured.

REMARKS. *Aega deshaysiana* has had a complicated nomenclatural and taxonomic history. Milne Edwards' original description (as *Rocinela deshaysiana*) was so brief as to be of little use (a single sentence, comprising 8 lines of text). The type-locality was given simply as "Mediterranean," and no figures were provided. Schioedte and Meinert (1879) had 3 specimens available for study and provided a somewhat expanded description and 3 figures, placing the species properly in Leach's genus *Aega*. Schioedte and Meinert's figures clearly depict the unique notched uropodal endopod. Despite the fact that their figures and descriptions for *A. deshaysiana* and *A. antillensis* were essentially identical, they did not consider the two to be the same, and it was Nierstrasz (1918) who made the synonymy. It was also Nierstrasz (1931) who appears to have first recognized the wide ranging nature of this species, which

was also commented upon by Siversten and Holthuis (1980). Most subsequent authors apparently were not aware of the synonymy, continuing to refer to these nominate species separately (e.g. Hale, 1925, 1929; Barnard, 1920, 1925; Menzies and Frankenberg, 1966; Schultz, 1969; Kensley, 1975, 1976, 1978; Moreira and Sadowsky, 1978). Hale (1925), upon examination of 4 specimens, noted considerable variability in features traditionally used to define *A. antillensis,* synonymizing Richardson's *Aega excisa* (1910) with the former (another synonymy that has gone largely unnoticed). Siversten and Holthuis (1980) briefly review the history of *A. deshaysiana* and point out that, "A thorough study of the species based on extensive material from numerous localities is clearly called for."

I have examined the types of *A. deshaysiana, A. antillensis,* and *A. excisa,* but have been able to locate only 5 additional specimens in this "complex." Fortunately, the 8 specimens I have examined represent a broad geographic coverage: Hawaii, Japan, the Caribbean, the Gulf of Mexico, the Philippines, the Mediterranean Sea, and the eastern tropical Pacific. All 8 specimens are remarkably similar, and the unique notched uropodal endopod of this "complex" quickly distinguishes these isopods from almost all other known aegids. The only other member of the genus that I am aware of possessing a similarly notched uropodal endopod is the southern South American (Pacific and Atlantic) cold-water species *Aega magnifica* (Dana). Several other characters also unite the "*A. deshaysiana* complex," including: the unique "fishhook" subapical spines of maxilla 1; the unusual squared-off proximal lobe of the pleopodal endopods; and, the presence of only a weak process on the second article of antenna 1 (although the basal articles are clearly expanded). The weak antennal process is also present in *Aega stroemii.*

Subtle differences do exist with regards to spination on the pereopods and mouth parts. The 4 west Atlantic specimens bear 3 large distinct spines on the inner margin of the merus of pereopod I (i.e. types of *A. deshaysiana* and *A. antillensis,* and USNM numbers 9564 and 97891); the Philippine specimen (type of *A. excisa*) bears 4 spines; the Hawaii specimen bears 5 on one leg and 6 on the other (USNM 28974); the Japan specimen bears 5 (USNM 22687); and the eastern Pacific specimen bears 3 (see Table II). The arrangement of these spines is consistent, in that the 3-spined specimens always have 1 subbasal and 2 subapical spines, while the others have additional spines added medially between these. The numbers of spines on pereopods IV-VII varies considerably, hence I have used "number of spine *patches* along inner margin" as a more conservative feature in comparing these specimens. But, as can be seen in Table II, even this varies somewhat. The size of the apical process on the inner margin of the propus of pereopod I-III is also variable. In the type of *A. deshaysiana* it is small; in the types of *A. antillensis* and *A. excisa,* and in specimens from Hawaii, Japan and the Philippines it is modest; in specimens from the Gulf of Mexico (USNM specimens labeled *A. antillensis* by H. Richardson) it is quite large (as shown in the figure of Australian specimens by Hale, 1925). Hale also pointed out that this process is smaller in females than in males. These data are presented in Table II. As can be seen, no geographic trend is evident, nor is any correlation seen among the character suites of specimens and their localities. Spination of the mouthparts also appears to be randomly distributed and shows no correlation to geography or the distribution of pereopodal features. The range of this variation is incorporated into the species description provided above. The holotype (*Rocinela deshaysiana* H. Milne Edwards) bears a faint raised ridge on the pleotelson, as figured (Fig. 1e). This may be indicative of regrowth from a damaged pleon in earlier instars. No other specimens have this ridge. Adult length ranges at least from 33 mm to 57 mm.

Because morphological variation that exists in specimens from throughout the world appears to be random, it seems highly likely that the complex does indeed represent a single, widely distributed, polymorphic species, and I am in agreement with previous synonymies.

Females bearing oostegites differ from males in several regards. In addition to the differences evident on pereopods I-III mentioned above, the maxilliped differs strikingly. It lacks the robust spines of the males, and instead has the margins of the palp lined with PMS (Fig. 2h). Similarly, the lobes of the second maxillae lack recurved spines but bear short simple setae on their surfaces, as well as PMS (Fig. 2c). Finally, the subapical spines of the first maxillae lack the distinct "fishhook" structure.

Perhaps the oddest aspect of this species is its apparent close relationship with *Aega magnifica,* with which it shares the unusual notched uropodal endopod. Unlike *A. deshaysiana,* which is primarily a warm-water form, *A. magnifica* occurs only in cold temperate waters of southern South America.

TYPE-MATERIAL.

Aega antillensis schioedte and Meinert, 1879. ZMB No. 4-046; Holotype; Cuba.

Aega excisa Richardson, 1910. USNM No. 40912; Holotype; female; Philippine Islands. U.S.S. "Albatross" Philippine Expedition, 1907-08; Station No. D-5173, 5 March 1908. Label in jar reads, "off Jolo Lt."

Rocinela deshaysiana H. Milne Edwards, 1840. MNHN No. Is-903; "Presumed Holotype" [pers. comm., J. Forest]; male; northwest coast of Africa (in Mediterranean Sea). Label in jar reads, "Palerme,"

Aega schioedteana Bovallius, 1885. Present deposition unknown.

ADDITIONAL MATERIAL EXAMINED. Japan, USNM No. 2268, 1 individual. Hawaii, Pailolo Channel, between Molokai and Maui Islands, "Albatross" Exped., Sta. No. 3863, 254-308 m, USNM No. 28974, 1 individual. Costa Rica, Cocos Islands, Chatham Bay, "Velero IV," Sta. No. 780-38, 14 January 1938, 1 individual. Gulf of Mexico, 29°50′ N, 86°30′W, M/V "Oregon," Sta. No. 944, 100 m, 21 March 1954, 1 individual. Gulf of Mexico, "Albatross" Exped., Sta. No. 2359, USNM No. 9564, 1 individual.

DISTRIBUTION. Largely circumtropical, but penetrating temperate waters of Old World Southern Hemisphere (see Fig. 12). *Aega deshaysiana* has been reported from the following localities: Japan; Philippines; off Solomon Islands (N.E. of Australia); southeast Australia (including vicinity of Tasmania); Mediterranean Sea (N.W. Africa); Azores; Seychelles Islands; Natal (So. Africa); St. Paul Island (southern Indian Ocean); Cape Verde Islands; Tristan da Cuhna Island; various localities in the Gulf of Mexico, Caribbean and West Indies (including Antilles and Cuba); Hawaii; Cocos Islands (Pacific Costa Rica). Although Kensley (1975) included *A. antillensis* in his list of South African isopods, he did not include it in the systematic section of his paper. Kensley's (1976) report of this species from St. Paul Island indicated his identification to be uncertain, due to "slight differences in the frontal laminae, telson, etc."; Kensley concluded that St. Paul Island was part of a "cold temperate faunal category."

BIOLOGICAL DATA. Ecological data are scant for this species. Information on substrate type is available for two collections—Cocos Islands, "coarse white sand"; South Africa, "course sand" (Kensley, 1975). Collection depths range from 100 to 462 m. Siversten and Holthuis (1980) attempted to associate this isopod with a "host fish," as did Kensley (1976). Those references can be consulted if so desired; I do not consider aegids parasitic and hence regard such associations as accidental or indicative only of temporary prey species.

Aega (Aega) acuminata Hansen, 1897
Figs. 1f, 4, 5

Aega acuminata Hansen, 1897: 104. Van Name, 1924: 183; Nierstrasz, 1931: 180; Richardson, 1904: 29.

DESCRIPTION.

Cephalon. Cephalon wider than long, width 2.8 x length. Eyes large, well pigmented. Frontal margin nearly evenly convex, slightly subacute. Frontal lamina large and shield-shaped; elevated, but not on a narrow pedicel. Antenna 1 with proximal article of peduncle triangular; 18-20 flagellar articles, first being ½ length of others; middle articles with spines; distal articles with esthetascs. Antenna 2 peduncle with second article incised and divided longitudinally into 2 pieces; article 4 with distal lobe; flagellum of 18-20 articles. Maxillipedal palp with proximal article short; second article triangular; middle articles produced into strong distal lobes; distal article very small and immersed into pentultimate article; terminal article with 4 spines; pentultimate article with 7 spines; middle article with 4 spines, second article with 1 spine. Maxilla 1 with 8 large apical spines. Maxilla 2 large lobe with 4 apical spines; small lobe with 2 spines and 2 long setae. Mandible simple, with scalloped incisor process and subapical tooth; palp with middle article bearing large apical lobe and setae as figured.

Pereon: Body quite broad, total length equals 1.9-2.0 times width. Pereonite I longest; pereonites decreasing in length posteriorly; III-V widest. Coxae II-VII large, free, well-formed, with acute distolateral angle and 2 strong oblique ridges (1 medial, 1 ventral); all coxae reaching about to posterior margin of respective somite; IV-VII visible in dorsal aspect. Pereopods increase gradually in length posteriorly; pereopod I propus with large distal lobe; ischium and merus with spines as figured; pereopod IV with all articles (except dactyl) spined as figured; basis grooved; pereopod VII similar to IV, as figured.

Pleon: Pleonites decrease slightly in width posteriorly, 5 being distinctly narrower than 4; pleonites subequal in length, although pleonite one is partly covered by pereonite VII. Pleotelson with posterior margin strongly acuminate, with fine marginal setae and 3 small spines on either side of apex. Uropods extended beyond pleotelson margin; inner angle of peduncle modestly expanded and acute; exopod ovate, with about 8 lateral and 2 medial spines; endopod falcate, with about 6 lateral and 4 medial spines; both rami and peduncle with PMS as figured. All pleopods with PMS as figured, decreasing on endopods posteriorly; endopods ovate; with "plumose coupling setae" and PMS on inner margin of peduncle; pleopod 1 peduncle divided into 2 pieces; pleopods 3-5 similar; pleopod 5 endopod with a proximal lobe and without coupling setae on peduncle; appendix masculina of male (holotype) simple, without ornamentation, arising from base of endopod.

REMARKS. Hansen's original description was based on a single specimen, a female lacking oostegites, 16.2 X 31 mm in size. Hansen's description is accurate, although he did not describe or figure the mouth parts or pleopods, and describes the eyes as dark grayish or black. In both the type specimen

and a second specimen from Costa Rica the eyes are brick red. The following combination of characters distinguishes this species from its eastern Pacific congeners: terminal article of maxillipedal palp very small, immersed in pentultimate article; pentulimate article of maxillipedal palp with 7 spines; falcate uropodal endopods; an expanded apical lobe on the middle article of the mandibular palp; posterior margin of pleotelson strongly acuminate.

TYPE MATERIAL. *Aega acuminata* USNM 20725; holotype, 1 female; "Albatross" Station 3403 (eastern Pacific Expedition), 28 March 1891, off Galapagos Islands, 0°58′30″S 89°17′W, 768 m.

ADDITIONAL MATERIAL EXAMINED. SIO Cat. No. C3781, accession No. B173-37, off Cabo Blanea, Costa Rica, 9°23′N, 85°06′W, 22 April 1973, 1353 m free vehicle trap, R/V "Agassiz," Coll. C. Hubbs and S. Luke; 1 male, 40 X 20.5 mm.

DISTRIBUTION. *Aega acuminata* is so far known fron only two localities, off the Galapagos Islands and off mainland Costa Rica (Fig. 13).

Aega (Aega) maxima Hansen, 1897

Figs. 1c, 6, 7

Aega maxima Hansen, 1897: 102. Richardson, 1904: 29; Nierstrasz, 1931: 183.

DESCRIPTION.

Cephalon: Cephalon much wider than long, width equals 4.0 times length. Eyes, large, well pigmented. Frontal margin with slight concavity either side of rostrum. Frontal lamina large and shield-shaped; elevated, but not raised on a narrow pedicle. Antenna 1 peduncle proximal article somewhat triangular; 17-18 flagellar articles, the basalmost being very short; proximal articles with spines; distal articles with 3-4 esthetascs per article (only one is illustrated; Fig. 6f). Antenna 2 peduncle with second article divided into two pieces, upper piece with subdistal setal row; flagellum of 22-23 articles, each with subdistal row of short simple setae and apical marginal setae. Maxillipedal palp with proximal article quite short; second article triangular; middle articles produced into lobes; distal article very small and somewhat immersed in pentultimate article; terminal article with 3 robust spines and 2 stout setae; pentultimate article with 6 robust spines and 6 stout setae; middle article with 6 robust spines and a stout seta; article 2 with long setae only. Maxilla 1 with 3 large apical spines and 4 subterminal recurved spines. Maxilla 2 bilobed, with 4 stout recurved spines on each lobe; lobes subequal in size. Mandible with incisor process scalloped, with 2 distal and one subdistal teeth; middle article of palp without apical lobe.

Pereon: Total body length/width ratio equals 2.1; pereonite I longest; pereonites III-V widest. Coxal plates II-VII large, free, well-formed, with acute distolateral angles, and 2 strong oblique ridges (1 medial; 1 ventral); all coxae extended to or beyond posterior border of their respective pereonites; II-VII visible in dorsal aspect (although II just barely so). Pereopod I propus with a small distal lobe; ischium and merus with spines. Pereopods IV-VII with short dactyls, much smaller than propi; pereopod IV with all articles (except dactyl) spined as figured; basis grooved; pereopod VII similar to IV, as figured.

Pleon: Pleonites 1-4 subequal in length and width; pleonite 1 partly covered by pereonite VII; pleonite 5 manifestly narrower than 1-4. Pleotelson with posterior margin rounded, with fine marginal setae; there are apparent attachment points for 3 or 4 spines on either side of the apex, however, only a single spine is present on holotype, on either side of apex. Uropods reach slightly beyond pleotelson margin; inner angle of peduncle greatly expanded and acute; exopod acutely ovate, with 12 spines along outer margin (all but 2 spines missing from holotype left uropod, all missing from right uropod); exopod with 1 or 2 medial spines; endopod falcate, with 7 apical (medial) spines and 1 lateral spine; both rami and peduncle with PMS as figured. All pleopods with PMS as figured, and with rectangular endopods; pleopod 1 with peduncle divided; pleopods 1-4 with "plumose coupling setae" and PMS on inner margin of peduncle; pleopods 3-5 with outer distal angle of endopod produced into a short knoblike structure; pleopods 1-3 increase in size, 3-5 subequal in size; pleopods 3-5 similar but with decreasing numbers of PMS and decreasing size of endopod; pleopod 5 endopod with a proximal lobe.

REMARKS. Hansen described *A. maxima* from a single female specimen (without oostegites), 26 X 55 mm in size, from the vicinity of Malpelo Island, off the west coast of Panama. No specimens of this species have been reported since then, and the above description is taken from the holotype. The medial "keel" of the pleotelson, and its lateral "shallow depressions," as described by Hansen are very slight indeed. Hansen stated, concerning the pleotelson, ". . . as the posterior apex unfortunately is broken

off, nothing can be said about its shape, but most likely it was acute, and the posterior margin probably with about five spines on each side." It is unclear to me whether the pleotelson is broken or not; if it is, then there is most likely an acute posterior process in the natural state. However, the margin is quite smooth and symmetrical, and if it has sustained damage the healing process must have been exceptionally good. Only a single spine is left on each distolateral region of the pleotelson, although there appear to be attachment points for a total of 3 or 4 spines on either side. Similarly, many of the spines are missing from the uropodal rami. The following combination of characters distinguishes this species from its eastern Pacific congeners: cephalon very short, width equals about 4 times length; middle articles of maxillipedal palp produced into apical lobes; 4 stout spines on each subequal lobe of the second maxilla; uropodal endopods falcate.

TYPE-MATERIAL. USNM 20727; holotype 1 female; "Albatross" Station No. 3362 (eastern Pacific Exp.), 26 Feb. 1891, off Malpelo Island, 5°56′N 85°10′30″W, 2350 m. USNM label in jar with specimen reads "off Cocos Island-Off Panama."

DISTRIBUTION. *Aega maxima* is thus far known from only the type-locality (Fig. 13).

Aega (Rhamphion) longicornis Hansen, 1897

Figs. 1a, 8, 9

Aega longicornis Hansen, 1897: 106. Van Name, 1924: 183; Nierstrasz, 1931: 183.

DESCRIPTION.

Cephalon: Cephalon wider than long, width 2.5 times length. Eyes large, widely separated; with only traces of pigmentation. Frontal lamina large and shield-shaped, raised on a narrow pedicel. Antenna 1 with proximal article of peduncle triangular; distal article with numerous spines; flagellum of 15-17 articles, first ½ length of all others; holotype with only scattered esthetascs on flagellar articles (more are probably present than remain on type-specimen). Antenna 2 peduncle with proximal two articles, and distalmost article bearing spine-like protuberances on margin; second article incompletely divided; flagellum very long, extended to pereonite V, of about 25 articles, most with subdistal row of short simple setae and apical marginal setae. Maxillipedal palp with proximal article short, second article triangular; no articles produced into distal lobes; distal articles small but terminal article not immersed in pentultimate article; distal article with no spines but with 5 stout setae; article 4 with 4 robust spines; article 3 with 2 robust spines and a stout seta. Maxilla 1 with 1 very large and 4 shorter, only slightly recurved spines. Maxilla 2 with 3 stout, slightly recurved spines on each lobe. Mandibles simple, incisor process simple, with smooth cutting edge; inner surface with raised ridge forming a blunt "tooth"; middle article of palp without apical lobe.

Pereon: Total body length/width ratio equals 2.2; pereonite I longest; V-VI widest. Coxal plates II-VII free, well-developed, with subacute distolateral angles, and 2 faint oblique ridges (1 medial; 1 ventral); coxae increase in size posteriorly, only those of V-VII visible in dorsal aspect; V-VII reach well beyond posterior margins of respective pereonites. Pereopod I propus without distal lobe, but with a stout inner spine; basis through propus with spines as figured; pereopods IV-VII with dactyls of modest size, but still shorter than propi; pereopods IV and VII with all articles (except dactyl) spined as figured; basis of pereopod IV with weak groove.

Pleon: Pleonites subequal in length, decreasing slightly in width posteriorly; pleonite 1 partly covered by pereonite VII. Pleotelson with posterior margin acutely rounded, with fine marginal setae and 8 stout spines. Uropods reach considerably beyond pleotelson margin; inner angle of peduncle moderately produced and acute; exopod acutely ovate, with 11 outer spines and notches for what appears to be 5 medial spines (although these are missing on the holotype); endopod with 5 medial spines and 4 lateral spines (1 missing from holotype); both rami and peduncle with PMS as figured. All pleopods with PMS as figured, decreasing on endopods posteriorly; pleopods 1-4 with coupling spines and PMS on inner margin of peduncle; pleopod 1 peduncle divided; pleopod 2 peduncle incompletely divided; pleopods 3-5 similar, with subrectangular endopods having outer distal angle produced into a short knob-like structure; pleopod 5 without PMS on endopod.

REMARKS. Hansen described *A. longicornis* from a single specimen, a female lacking oostegites (6.5 × 14.5 mm). No other specimens are known to exist, and the above description is based on the type-specimen. Hansen described the propi of the first three pereopods as lacking spines; an apical spine is, however, present on this article, at least on pereopod I. The following combination of characters distinguishes this species from its eastern Pacific congeners: propus of pereopod I without an apical expanded lobe, but with a flattened plate-like structure; antennae 2 very long, extended to pereonite V, and with subapical rows of setae; uropods much longer than pleotelson.

TYPE MATERIAL. USNM 20728; 1 holotype (female); "Albatross" Station 3402 (eastern Pacific expedition), 28 March 1891, off Galapagos Islands, 0°57'30"S 89°3'30"W, 842 m.

DISTRIBUTION. Known only from the type-locality (Fig. 14).

Aega (Rhamphion) plebeia Hansen, 1897
Figs. 1b, 10, 11

Aega plebeia Hansen, 1897: 105. Richardson, 1904: 29; Van Name, 1924: 183; Nierstrasz, 1931: 183 [as *A. plebeja*]; Gurjanova, 1936: 72; Birstein, 1973: 172.
Aega magnoculis Richardson, 1909: 80. Richardson, 1910: 17; Nierstrasz, 1931: 181; Gurjanova, 1936: 70, 259; Birstein, 1973: 172 [synonymizes *A. magnoculis* with *A. plebeia*]; Kussakin, 1979: 126.

DESCRIPTION. *Cephalon:* Wider than long, width equals 2.7-2.8 x length. Eyes large; well pigmented; nearly touching at midline. Frontal lamina large; shield-shaped; raised on a broad pedicel. Antenna 1 peduncle with distal article long, about 2 times length of first or second article; 21-24 flagellar articles, first very short, second very long, all others about ½ length of second; medial and distal flagellar articles with esthetascs. Antenna 2 peduncle with proximal 3 articles short, distal 2 articles long; article 2 divided; flagellum of 17-18 articles. Maxillipedal palp with proximal article small; second article triangular; distal article very small, with 4 long stout simple setae, and one PMS; pentultimate article with 4 spines; middle article with 2 spines plus stout setae. Maxilla 1 with 3 large and 1 small apical spines. Maxilla 2 with 3 spines on each lobe. Mandible simple, incisor process blade-like with apical spinelike tooth; middle article of palp expanded distally but not forming a lobelike process.

Pereon: Total body length/width ratio equals 1.6-2.3; pereonites subequal in length, or I and V somewhat longer; IV-V widest. Coxae II-VII free, large, quadrate, with subacute distolateral angle and 2 weak oblique ridges (1 medial; 1 ventral); coxae II-V extended about to posterior margins of respective somite; coxae VI-VII reach beyond posterior margin of respective somite. Pereopod I ischium with apical lobe; propus with raised, flattened, subapical plate bearing a single robust spine; pereopods IV-VII manifestly longer than I-III; pereopods IV-VII with all articles spined (except dactyl). Larger individuals have more leg spines, although position of spine rows and bundles is constant, as follows; pereopod IV ischium with 3 patches of marginal spines, merus with 6 patches of marginal spines, carpus with 4 patches of marginal spines, and propus with 4 patches of marginal spines; all with apical spines. Pereopod VII ischium with 3 patches of marginal spines; merus with 4 patches of marginal spines and 3 submarginal spines, carpus with 4 patches of marginal spines, and propus with 5 patches of marginal spines; all with apical circle of spines.

Pleon: Pleonites decrease slightly in width posteriorly; subequal in length; pleonite 5 manifestly narrower than 1-4. Pleotelson shield-shaped, posterior margin subacuminate; length subequal to width; posterior margin with 4 or 5 posterolateral notches where spines presumably attach, although only 3 of these spines are present on the holotype. Uropods extended to or barely beyond posterior margin of pleotelson; inner angle of peduncle modestly produced and acute; exopod and endopod acutely ovate, about equal in length, with subacuminate apices; presumably with spines as indicated on Fig. 11e, but most of these spines are missing from all specimens examined; peduncle and endopod with plumose marginal setae. All pleopods with PMS as figured, decreasing on endopods posteriorly; pleopod 1 manifestly smaller than 2-5 and with peduncle divided into 2 pieces; peduncle of 2-5 with "plumose coupling spines"; peduncle of pleopods 1-4 with large spine on medial margin; pleopod 5 endopod with proximal lobe.

REMARKS. Although Hansen's original description was said to have been based on six specimens (1 male and 5 females), I have been able to locate only 3 of these cotypes, as follows: Male, 10 x 22.5 mm; female, 16 x 37 mm (with oostegites); female, 19.5 x 31 mm (without oostegites; herein figured). Hansen's original description is accurate, though limited. The "faint median keel and sublateral impressions" of the pleotelson, referred to by Hansen, are in fact so faint as to be hardly noticeable. His figure of pereopod I exaggerates the flat subapical plate of the propus, making it appear as though it were a large lobe (as seen in *A. acuminata* and *A. ecarinata*). Hansen described the eyes as "grey, somewhat blackish"; specimens I have examined have eyes ranging from black to dark red. The following combination of characters distinguishes this species from other New World congeners: large eyes, separated by distance less than width of one eye; uropods extended to or barely beyond pleotelson margin; antenna one with more than 20 flagellar articles; maxillipedal spination.

Birstein (1973) placed the north Pacific temperate species *Aega magnoculis* Richardson, 1909 (cited as 1910) into synonymy with *A. plebeia.* He apparently did so without examining the types of either species. I have examined types of both, as well as other specimens from both tropical and temperate waters, and concur with Birstein's judgment. Differences between Richardson's description of *A. magnoculis* and the above description of *A. plebeia* are insignificant; most her description merely repeats generic-level attributes of *Aega* (the mouth parts and pleopods were not described or figured). Richardson's description reversed the flagellar count of the first and second antennae.

There is some variation among specimens of *A. plebeia,* and these appear to be related to temperature as follows. Specimens from the tropics have 4 apical spines on the first maxilla; those from temperate waters (Alaska and southern Peru) have 5. Specimens from the tropics have both lobes of maxilla two bearing 3 large spines; those from temperate waters bear 3 spines on the larger lobe, but only 2 on the smaller lobe. Finally, specimens from temperate waters bear somewhat fewer spines on pereopods IV-VII.

There is considerable variation in the visibility of the coxal plates in the dorsal aspect (noted by Richardson, 1910). In Hansen's three cotypes this ranges from not visible at all to those of pereonites IV-VII being clearly visible.

TYPE MATERIAL.

Aega plebeia: USNM 20726; 3 syntypes (2 females, 1 male); "Albatross" Station 3363 (eastern Pacific Exp.), 26 Feb. 1891, off Cocos Island and Panama, 1956 m. Label in jar reads, "one female retained in Copenhagan."

Aega magnoculis: USNM 39499, 3 syntypes, all females (11 x 22.5 mm, 7.5 x 17 mm, 12.5 x 27.5 mm); "Albatross" Station 4771 (northwest Pacific Exp.), 4 June 1906, 50°30′N 179°17′E, on "Bowers Bank," Bering Sea, 852 m.

ADDITIONAL MATERIAL EXAMINED. USNM Accession No. 323929, off Peru, Cruise 7201, 18°23′S 71°13′W, Sta. I-405, 1100 m, Coll: E. del Solar, 1 specimen. LACM accession No. 1974-2, Peru, between Lobos de Tierra and Lobos de Afuera,6°42′S 80°59′05″W, 1626-1635 hrs, 780 m, "beam trawl," Sta. SNPI-25, 22 January 1974, 1 female (9 x 19.5 mm). USNM 39903, Alaska, off Aleutian Islands, "Albatross" (northwest Pacific Exp.), Sta. No. 4781, 52°14′30″N 174°13′E, 688-964 m, 7 June 1906, 1 female (8.5 x 19 mm).

DISTRIBUTION. *Aega plebeia* has an extremely wide ranging and apparently disjunct distribution. In the eastern Pacific it is known from Aleutian Islands area (Richardson, 1909), the tropical coasts of Panama and Costa Rica (Hansen, 1897), as well as Peru (this study), and from temperate South America (Peru; this study). In the western Pacific it is known from the Philippines (Richardson, 1910) and the Kurile Islands (Birstein, 1973). In every case, *A. plebeia* has been collected in deep water off oceanic islands. This suggests its apparent disjunct range may be an artifact and further collecting in these habitats may show this species to have a continuous range (see Fig. 14).

ECOLOGICAL DATA. Little ecological data exists for *A. plebeia.* It has been taken from depths ranging from 688 m to 2534 m. In only a single case were data available regarding bottom type. Richardson (1909) stated, for Aleutian Islands specimens, the bottom was "broken shells, brownish-green sand, and fine grey sand and pebbles."

ZOOGEOGRAPHIC COMMENTS

Little can be said concerning the global zoogeography of *Aega,* as the group is still so poorly described in the Old World (where nearly 80 percent of the known species occur). Because of this, and because so many species are circumglobal or at least trans-oceanic in distribution, to attempt to draw conclusions at this time regarding relationships between east Pacific and west Atlantic species would be pointless.

Both subgenera of *Aega* occur on both coasts of America. Further, if all the known species of *Aega* are plotted on a world map, it is seen that both subgenera are distributed essentially everywhere. While *Aega* is best represented in the warmer waters of the world's oceans, there is also a significant number in colder waters, including the Arctic and Antarctic Oceans. The global distributional pattern of this genus (and family) corroborates the dating of the origin of these taxa as Permian-Triassic (Brusca, 1981).

The tropical eastern Pacific *Aega* fauna is comprised of both endemic and cosmopolitan species. *Aega (Aega) acuminata, Aega (Aega) maxima,* and *Aega (Rhamphion) longicornis* are presently known from only these tropical waters (Figs. 13, 14); *Aega (Rhamphion) plebeia* is trans-Pacific, in both tropical and temperate waters (Fig. 14);*Aega (Aega) deshaysiana* is circumglobal, having so far been reported from all major oceans except temperate North and South America and the Arctic Sea (Fig. 12).

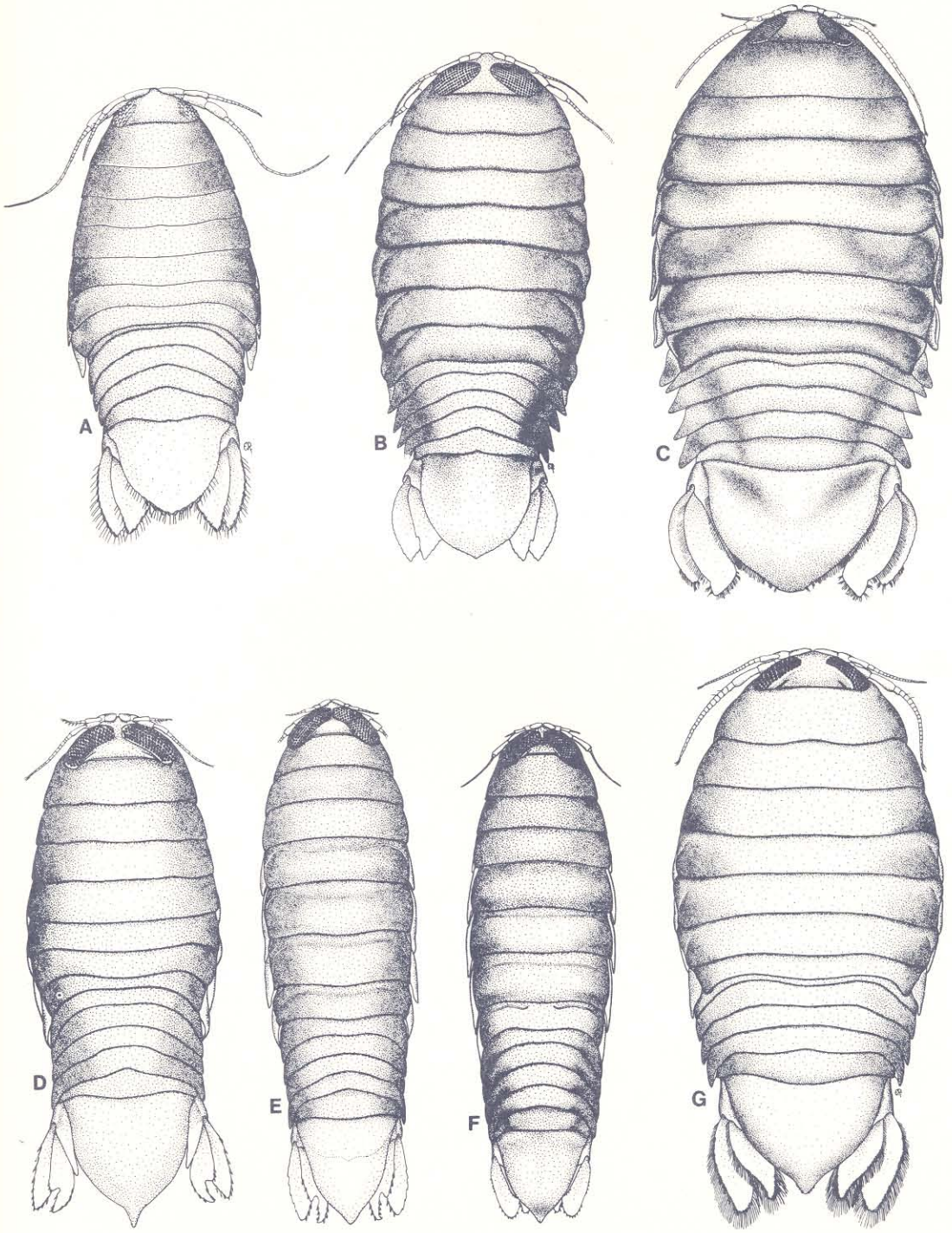

Figure 1. *Aega* of the tropical eastern Pacific. A. *Aega (Rhamphion) longicornis,* holotype; B. *Aega (Rhamphion) plebeia,* co-type, female; C. *Aega (Aega) maxima,* holotype, female; D. *Aega (Aega) deshaysiana,* Cocos Island specimen, male; E. *Aega (Aega) deshaysiana,* holotype, male; F. *Aega (Aega) deshaysiana* (holotype of *A. antillensis),* female; G. *Aega (Aega) acuminata,* holotype, female.

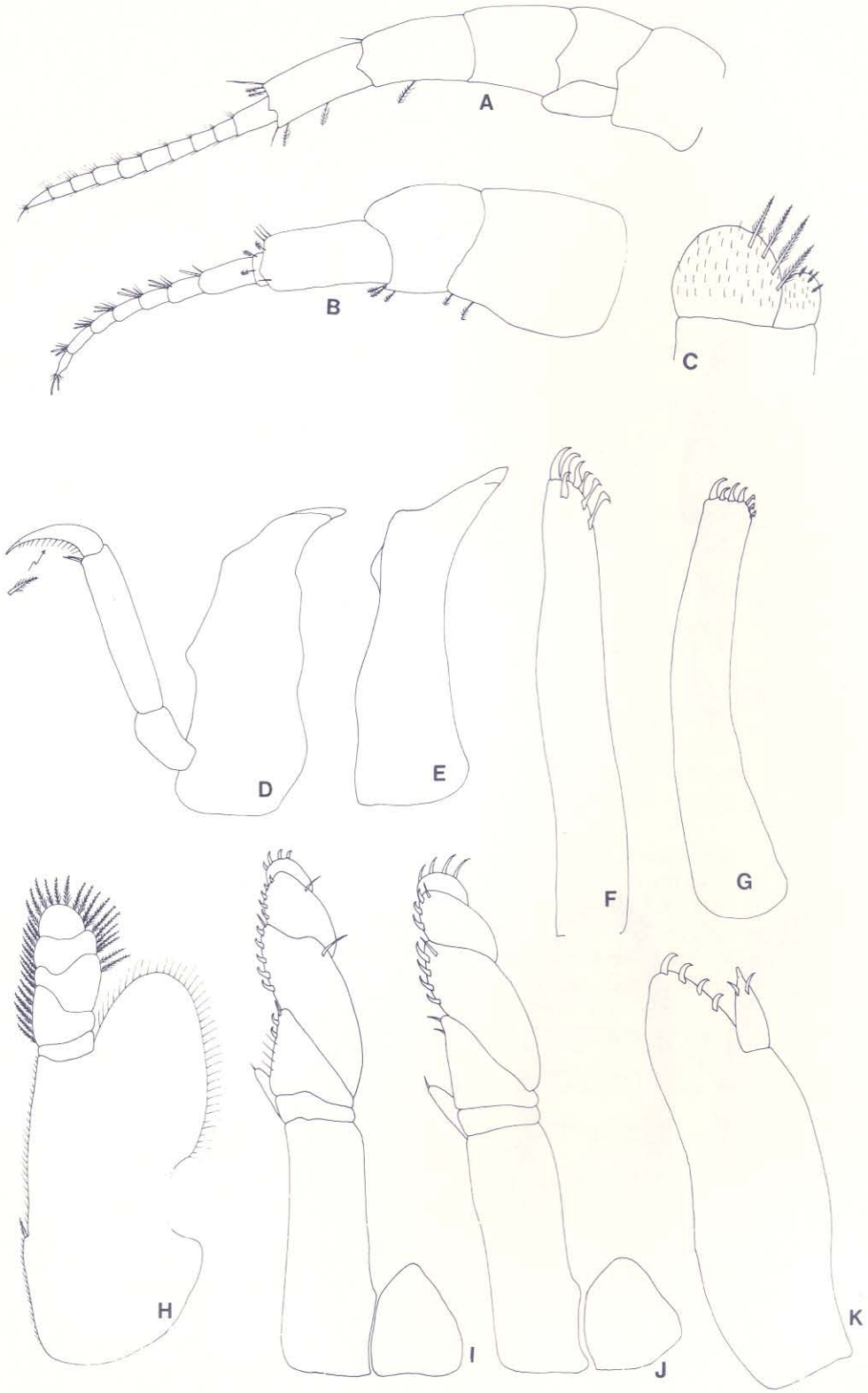

Figure 2. *Aega (Aega) deshaysiana.* A. antenna two, from Cocos Island specimen; B. antenna one, from Cocos Island specimen; C. second maxilla, from type of *A. excisa,* female with oostegites; D. left mandible, from Cocos Island specimen; E. left mandible, palp missing, from holotype; F. first maxilla (R), from holotype; G. first maxilla (L), from Cocos Island specimen; H. maxilliped, from type of *A. excisa,* female with oostegites; I. maxilliped, from Cocos Island specimen; J. maxilliped, from holotype; K. second maxilla, from holotype.

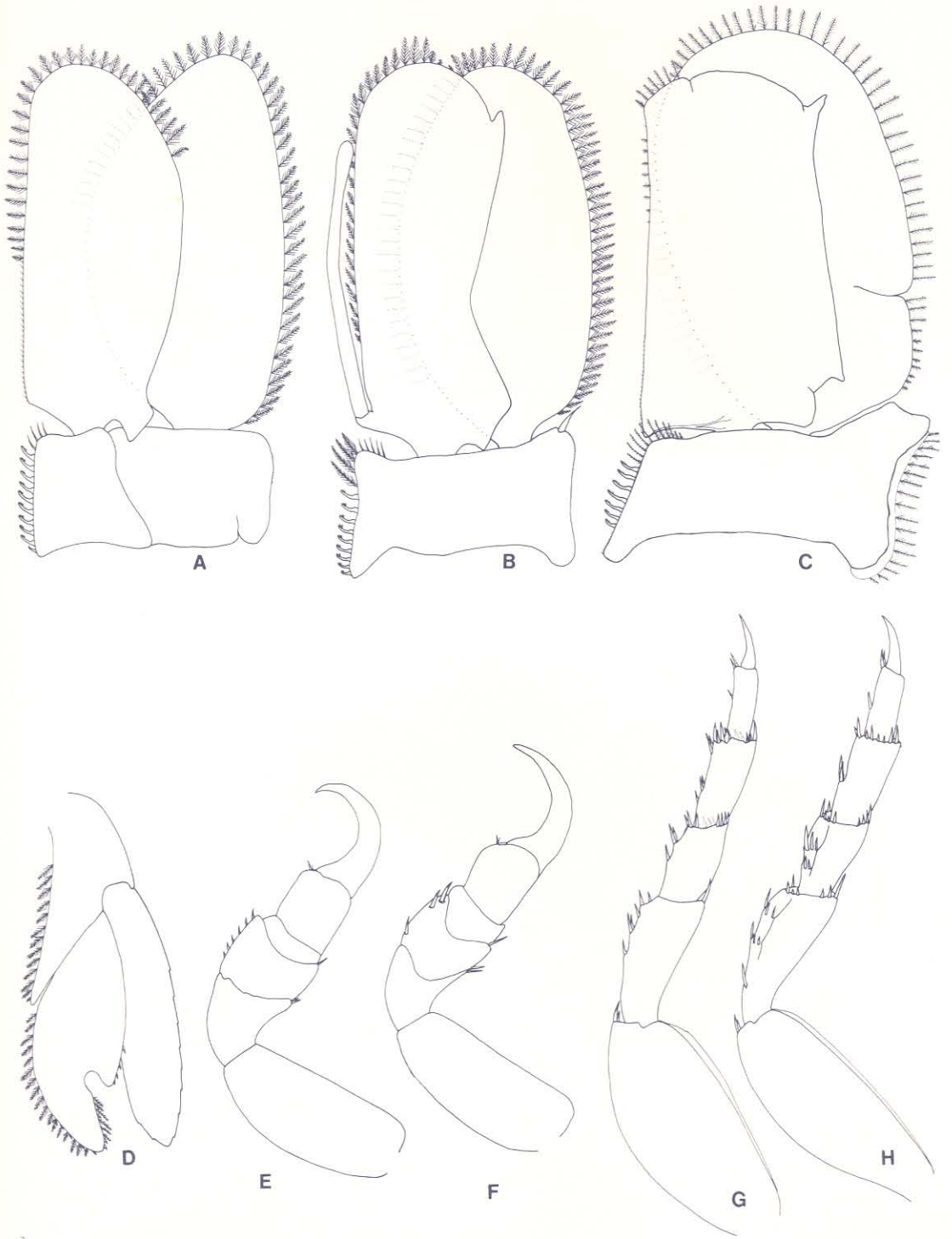

Figure 3. Aega (Aega) deshaysiana. A. first pleopod, from holotype; B. second pleopod, from holotype; C. third pleopod, from Cocos Island specimen; D. uropod, from holotype; E. pereopod I (R), from Hawaiian specimen; F. pereopod I (L), from holotype; G. pereopod IV (L), from holotype; H. pereopod VII (L), from holotype.

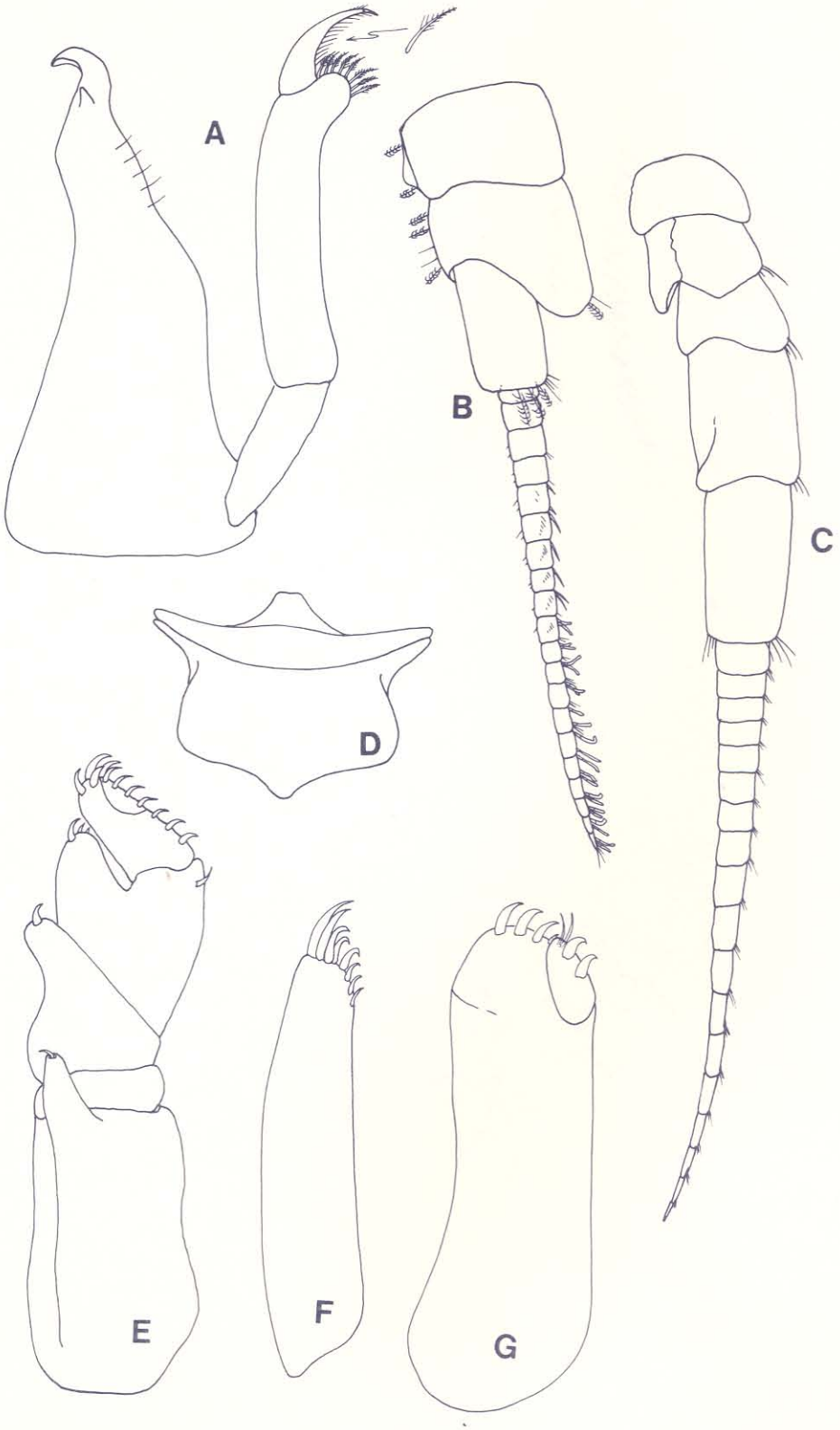

Figure 4. *Aega (Aega) acuminata* [all Figs. from holotype]. A. right mandible; B. first antenna; C. second antenna; D. frontal lamina, clypeus and labrum; E. maxilliped; F. first maxilla; G. second maxilla.

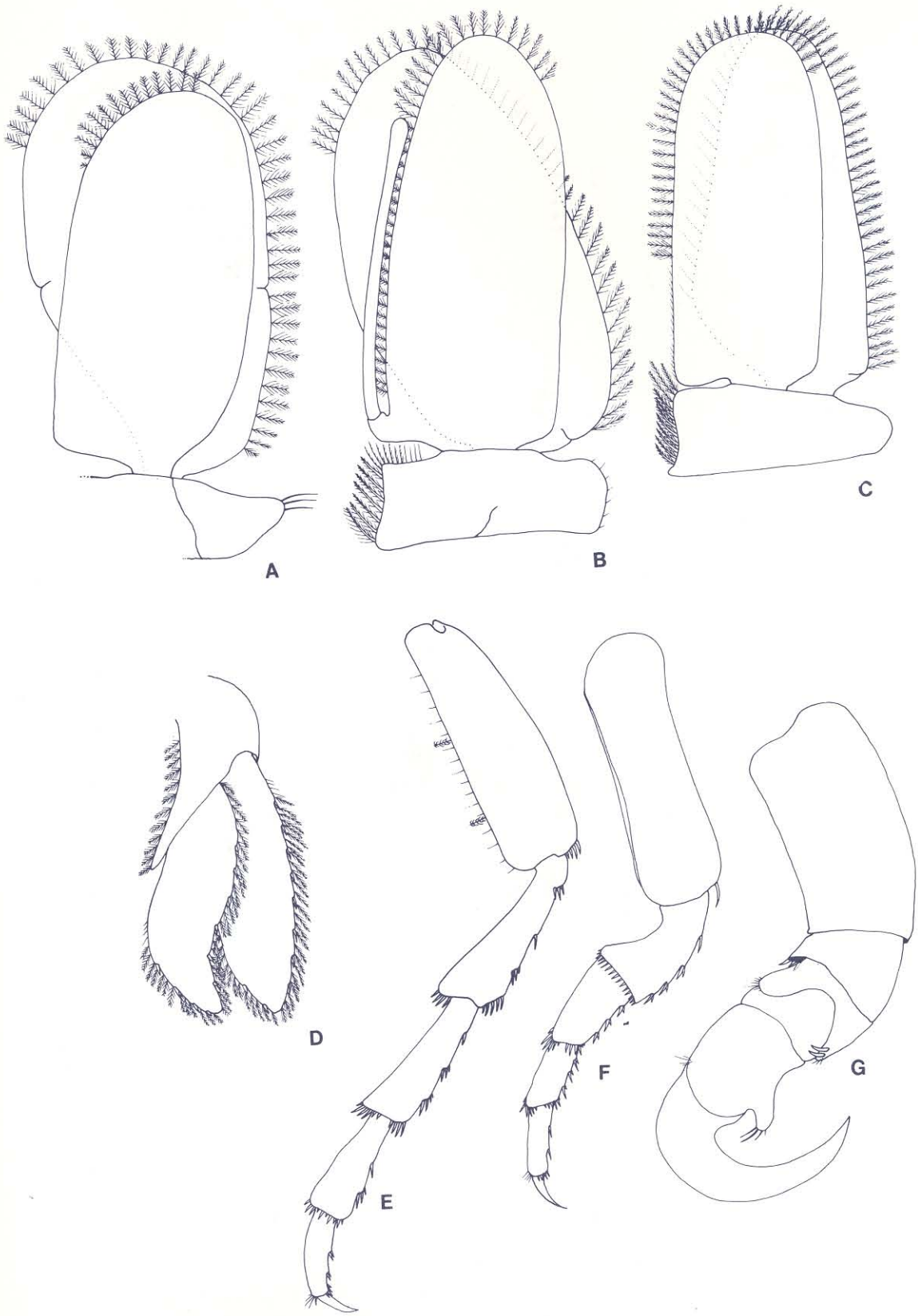

Figure 5. *Aega (Aega) acuminata* [all Figs. from holotype]. A. fourth pleopod; B. second pleopod; C. first pleopod; D. uropod; E. pereopod VII (L); F. pereopod IV (L); G. pereopod I (L).

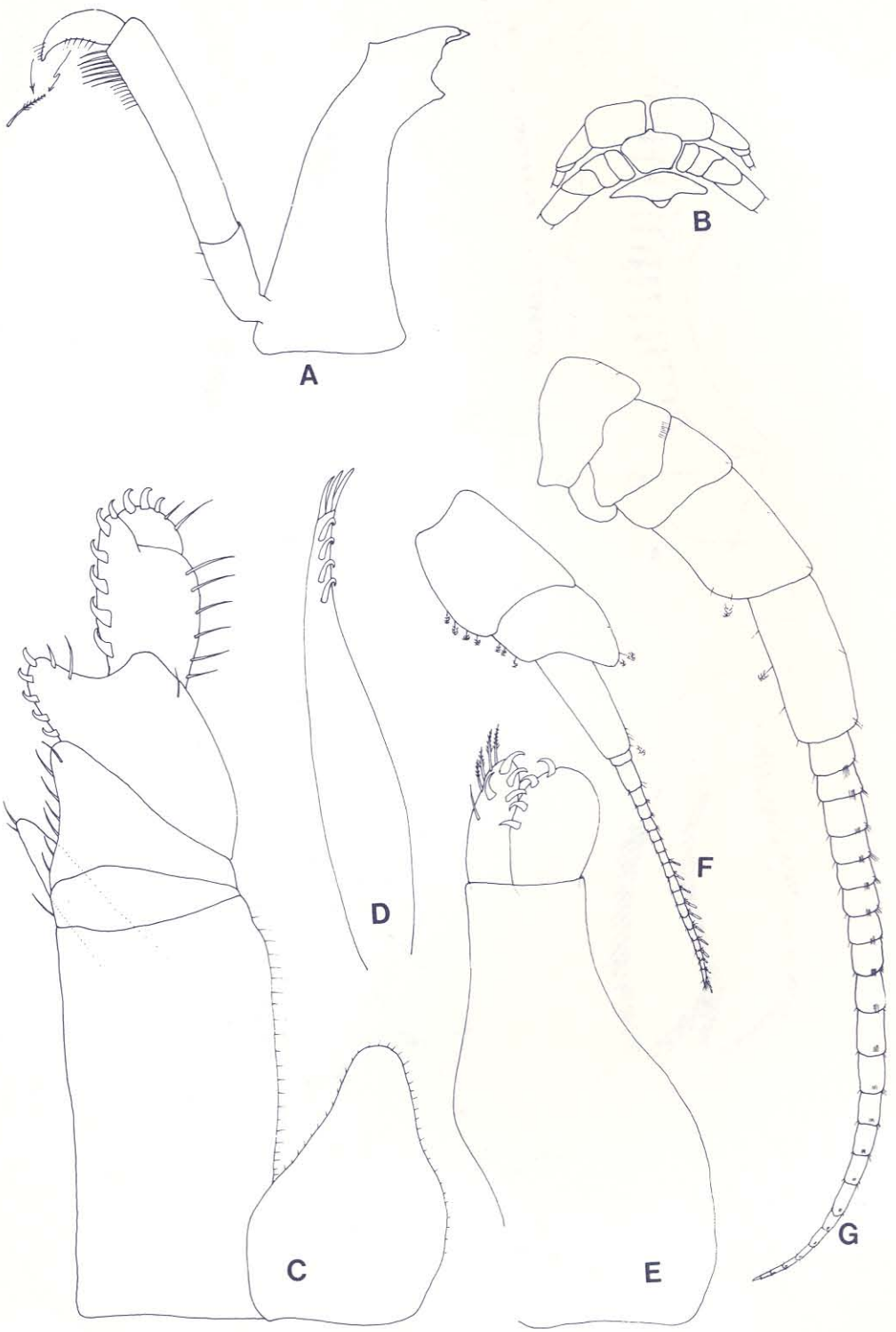

Figure 6. *Aega (Aega) maxima* [all Figs. from holotype]. A. left mandible; B. view of frontal lamina, clypeus and labrum (with bases of antennae included); C. maxilliped; D. first maxilla (L); E. second maxilla (L); F. first antenna; G. second antenna.

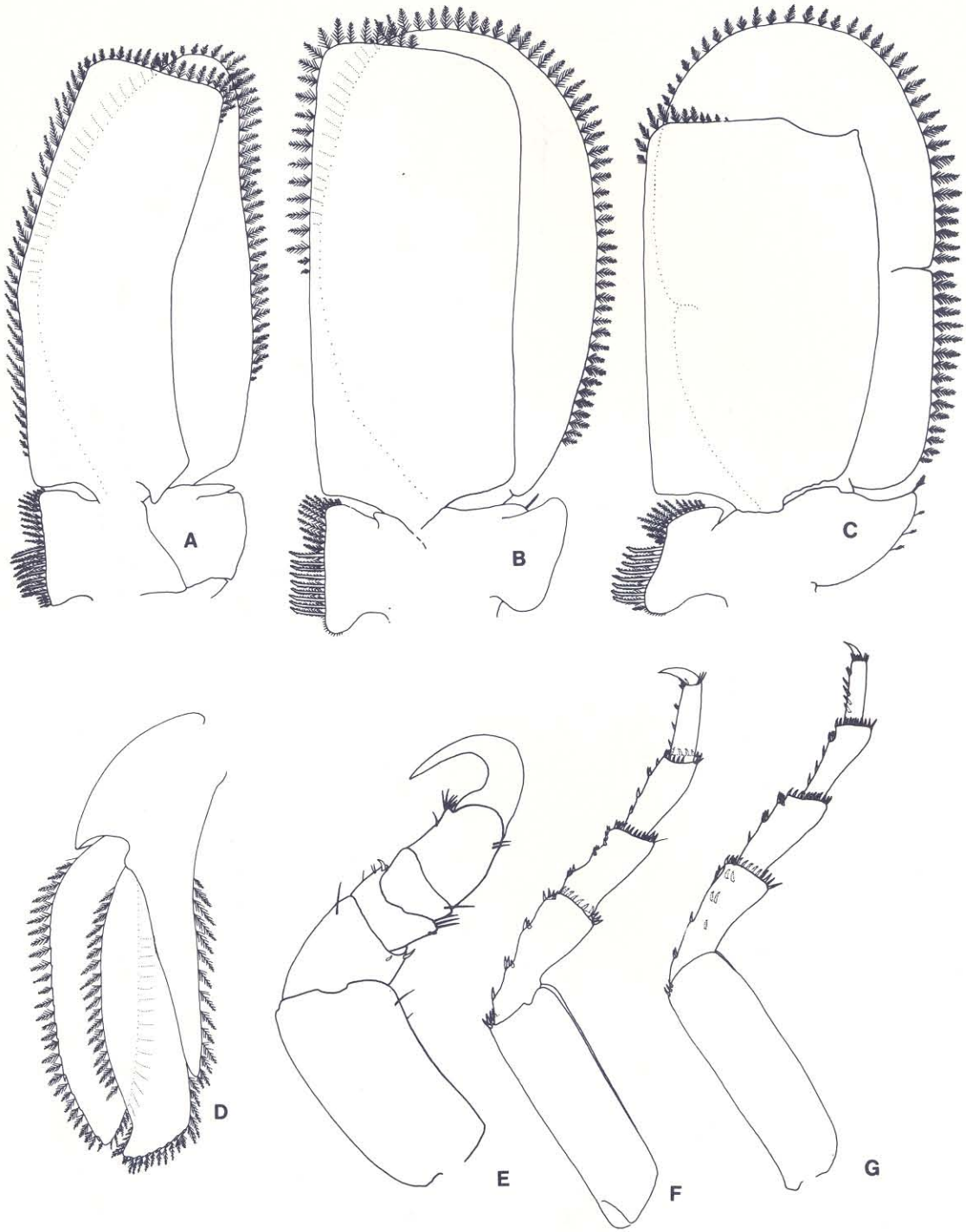

Figure 7. *Aega (Aega) maxima* [all Figs. from holotype]. A. first pleopod; B. second pleopod; C. fourth pleopod; D. uropod; E. pereopod I; F. pereopod IV; G. pereopod VII.

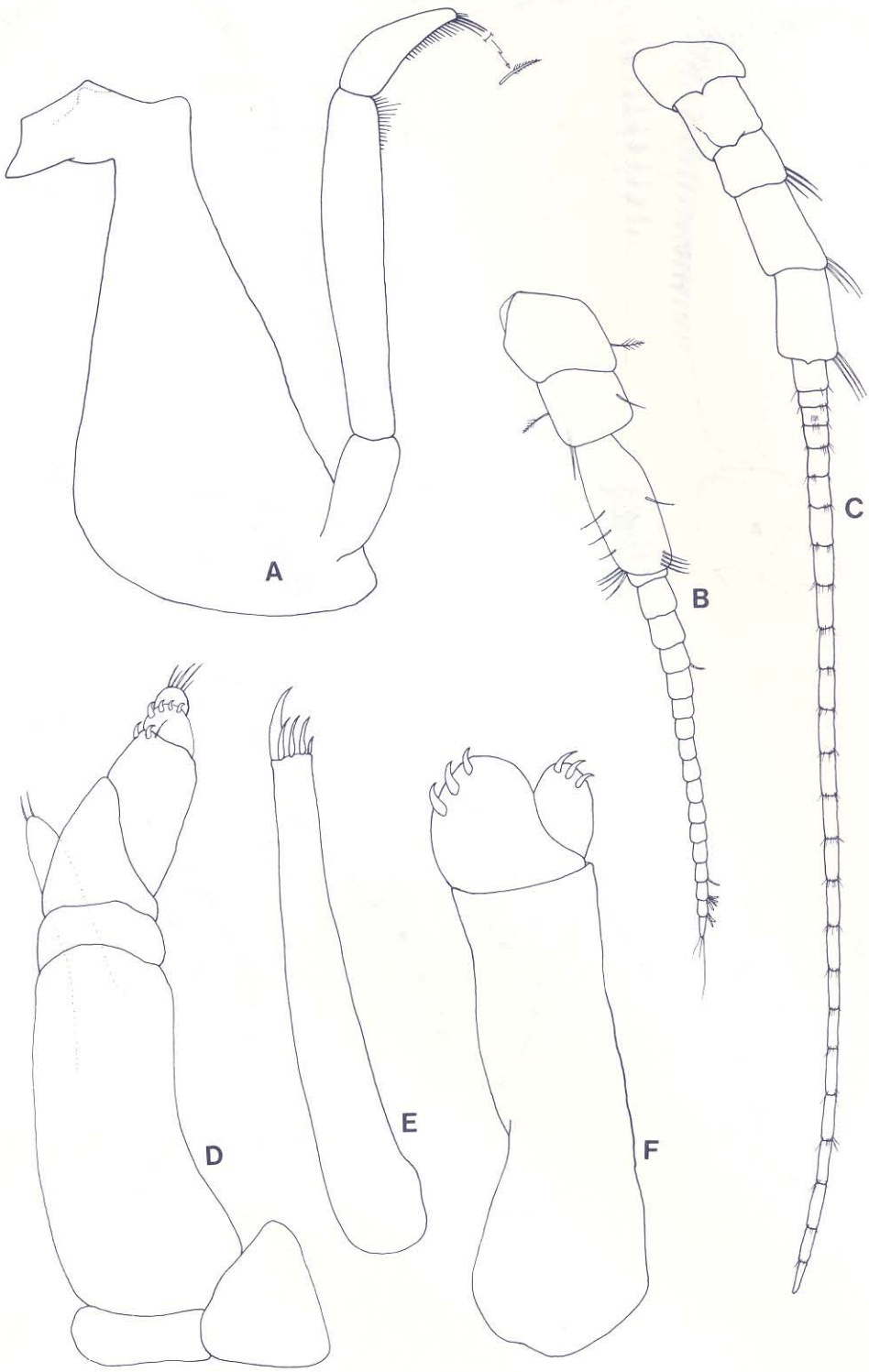

Figure 8. Aega (Rhamphion) longicornis [all Figs. from holotype]. A. left mandible; B. first antenna; C. second antenna; D. maxilliped; E. first maxilla; F. second maxilla.

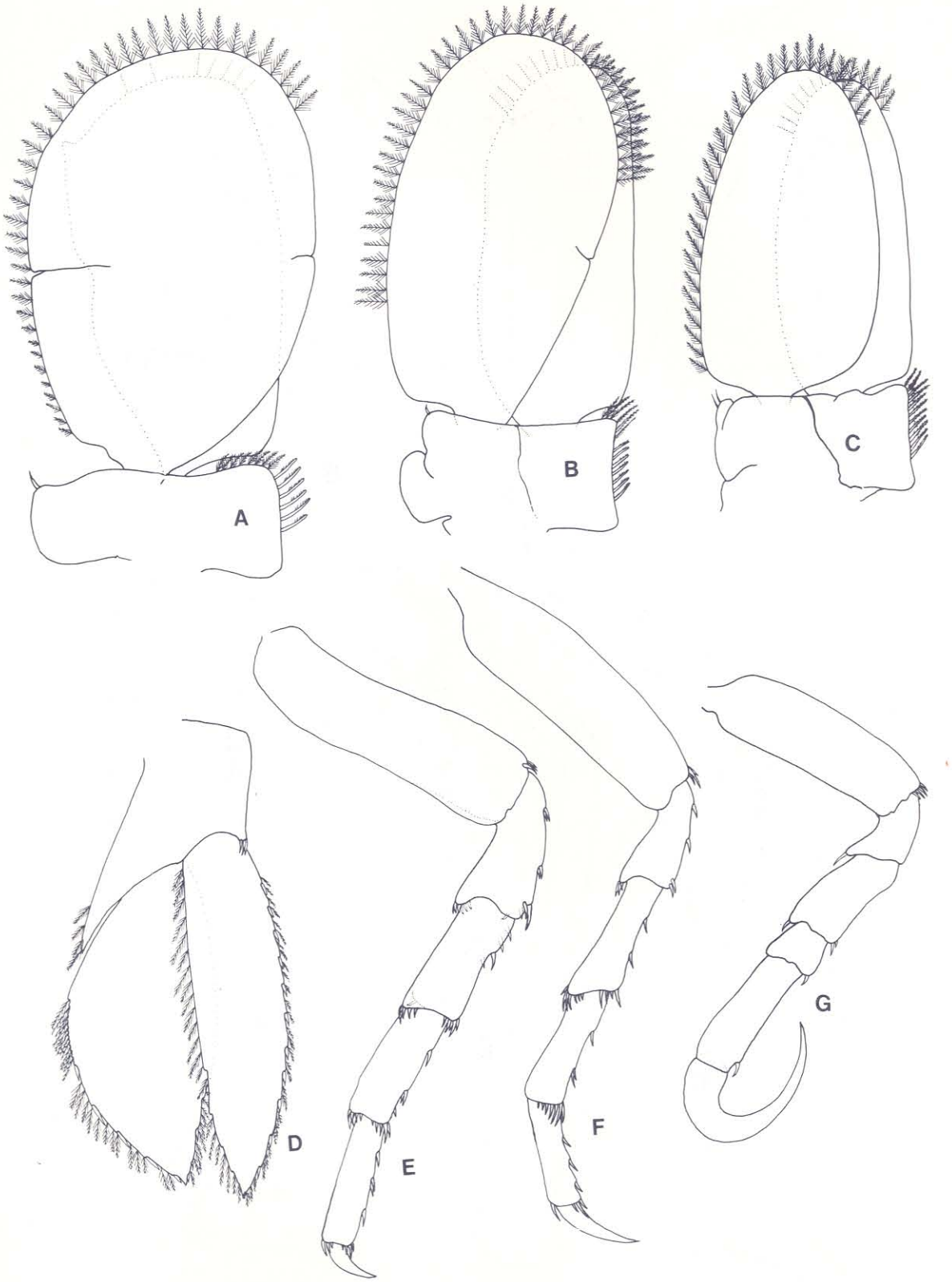

Figure 9. *Aega (Rhamphion) longicornis* [all Figs. from holotype]. A. fourth pleopod; B. second pleopod; C. first pleopod; D. uropod; E. pereopod IV; F. pereopod VII; G. pereopod I.

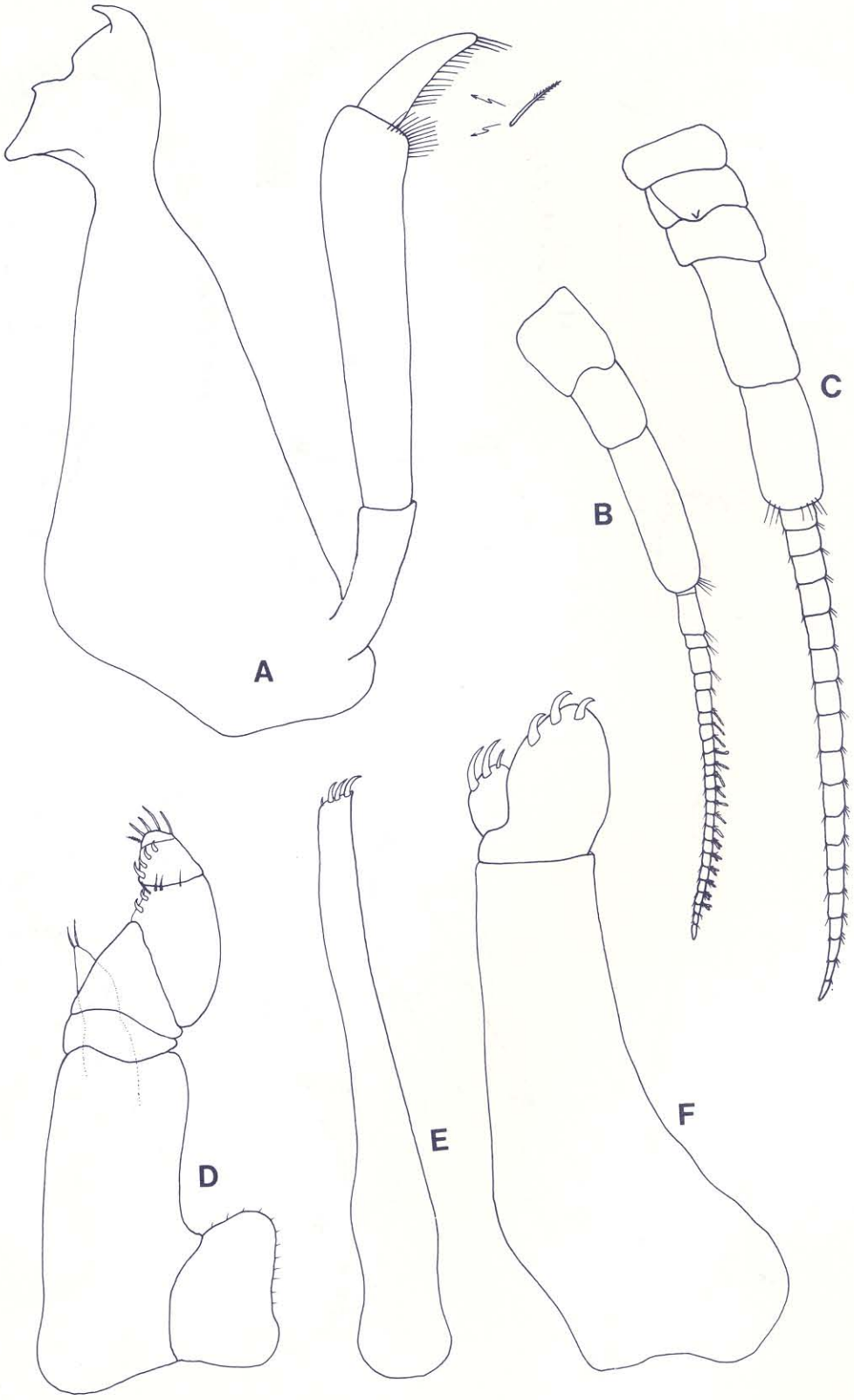

Figure 10. *Aega (Rhamphion) plebeia* [all Figs. from co-type, USNM No. 20726, non-ovigerous female]. A. left mandible; B. first antenna; C. second antenna; D. maxilliped; E. first maxilla; F. second maxilla.

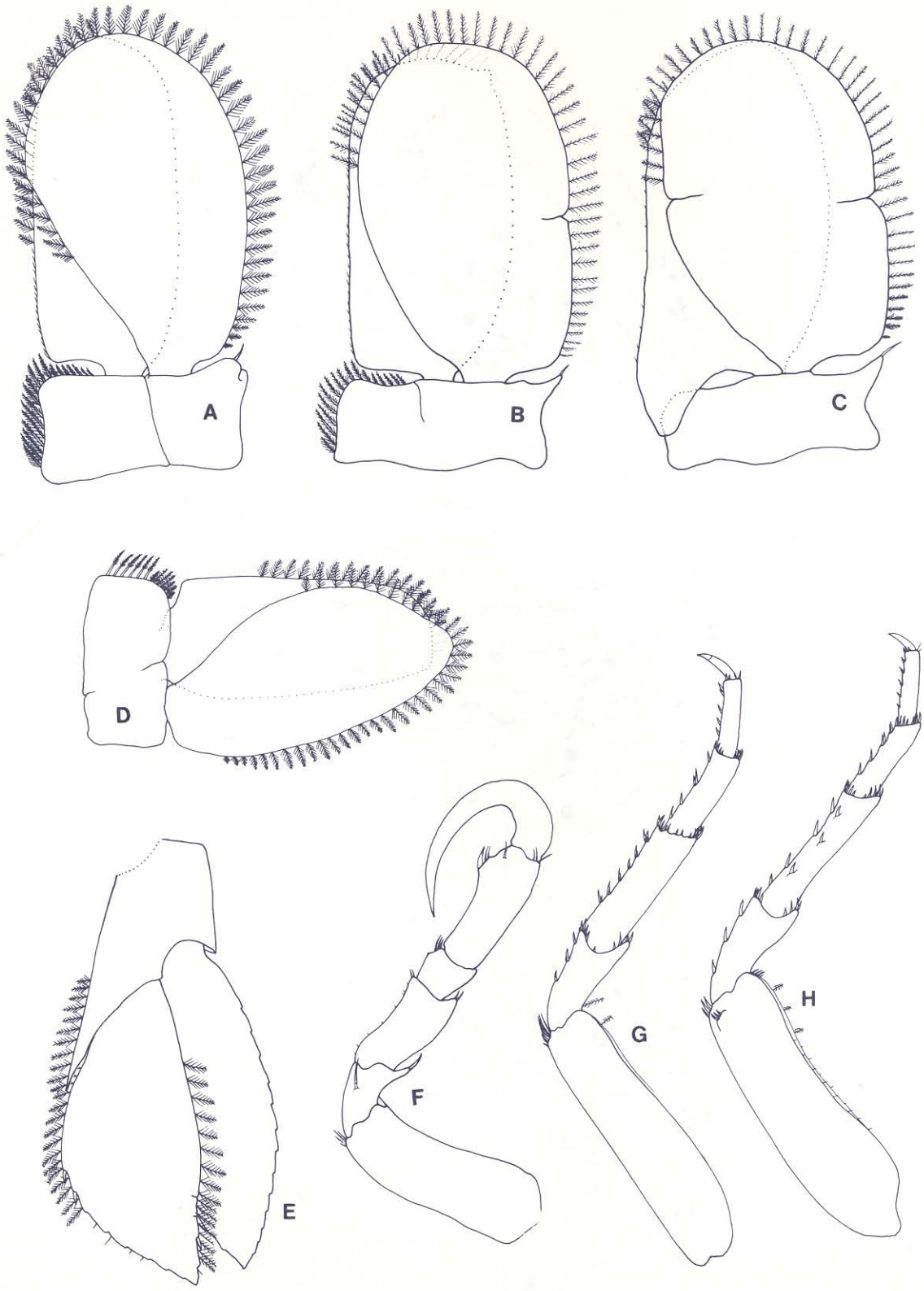

Figure 11. *Aega (Rhamphion) plebeia* [all Figs. from co-type, USNM No. 20726, non-ovigerous female]. A. second pleopod; B. third pleopod; C. fifth pleopod; D. first pleopod; E. uropod; F. pereopod I; G. pereopod IV; H. pereopod VII.

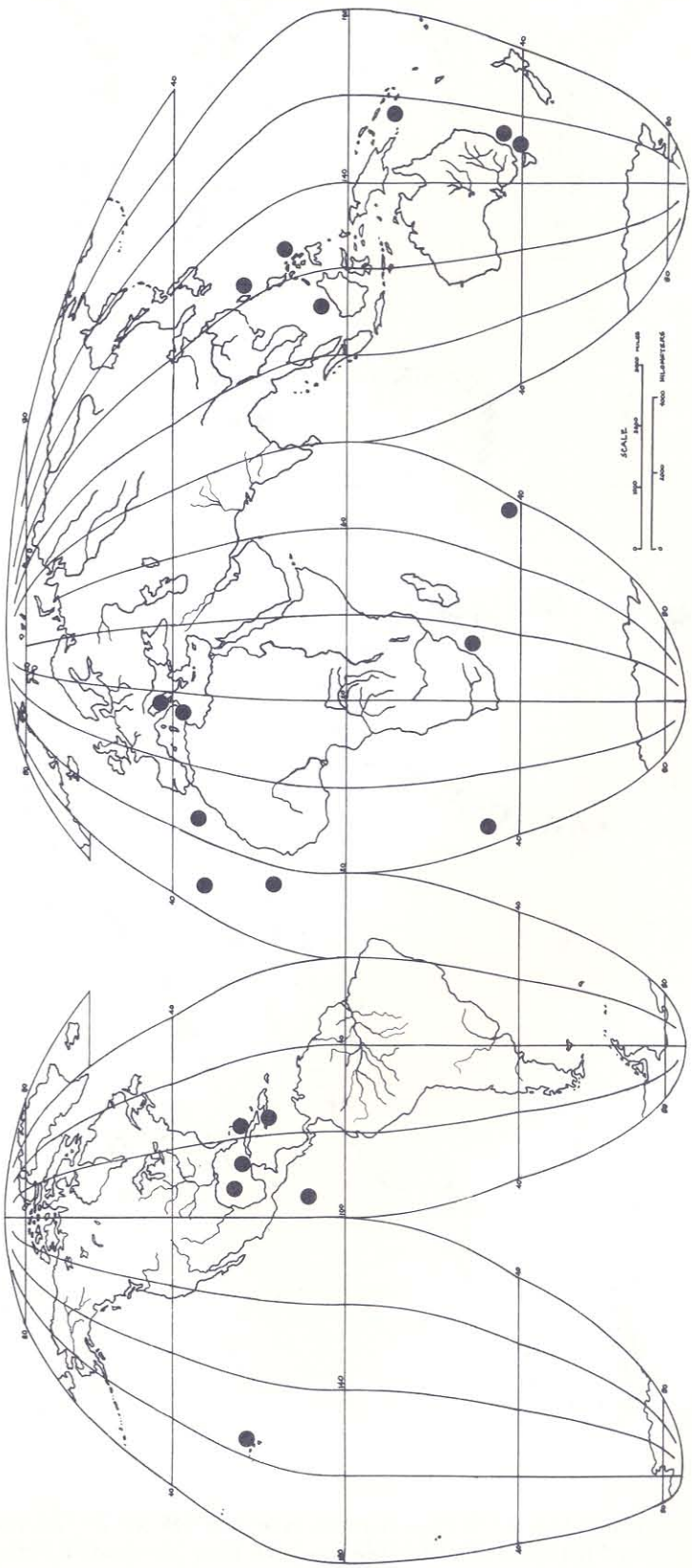

Figure 12. Distribution Records for *Aega (Aega) deshaysiana.*

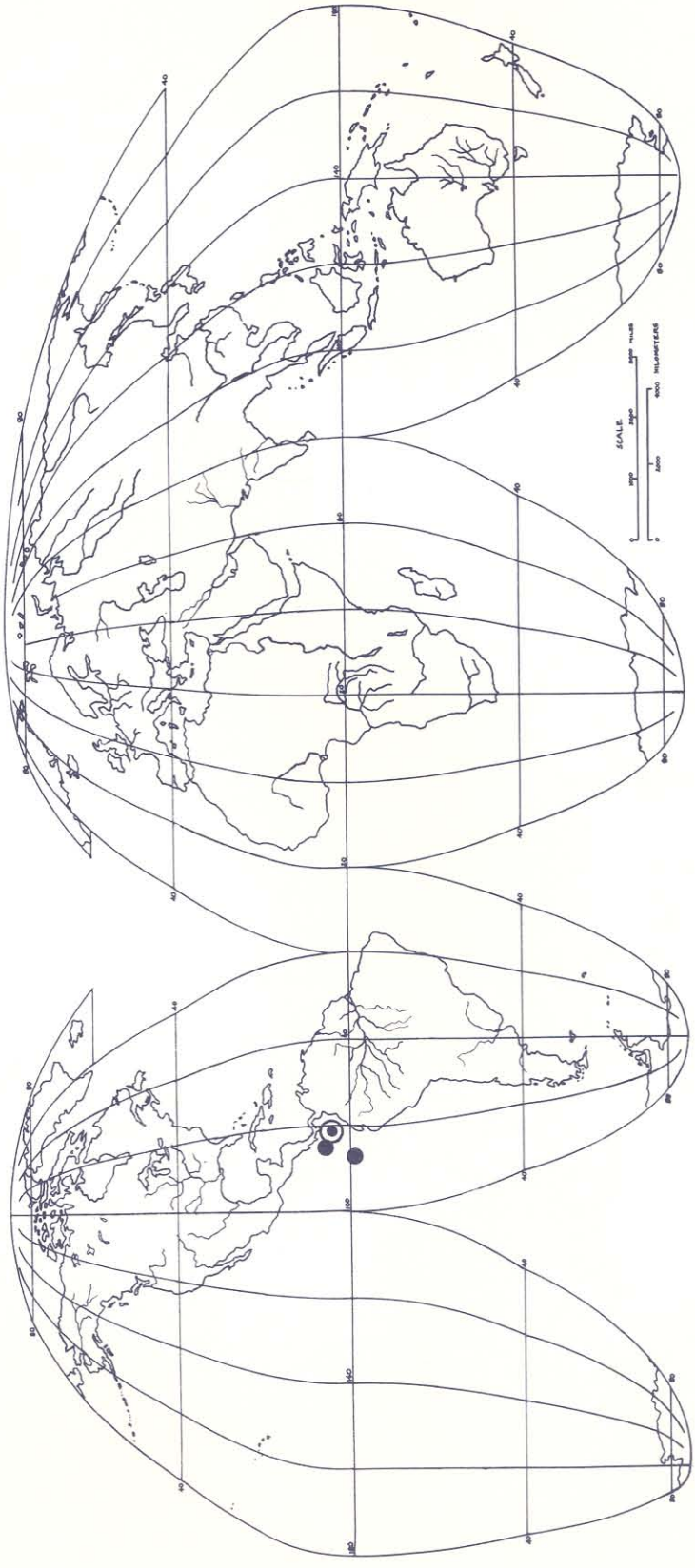

Figure 13. Distribution Records for *Aega (Aega) acuminata* (solid dot) and *Aega (Aega) maxima* (circled dot).

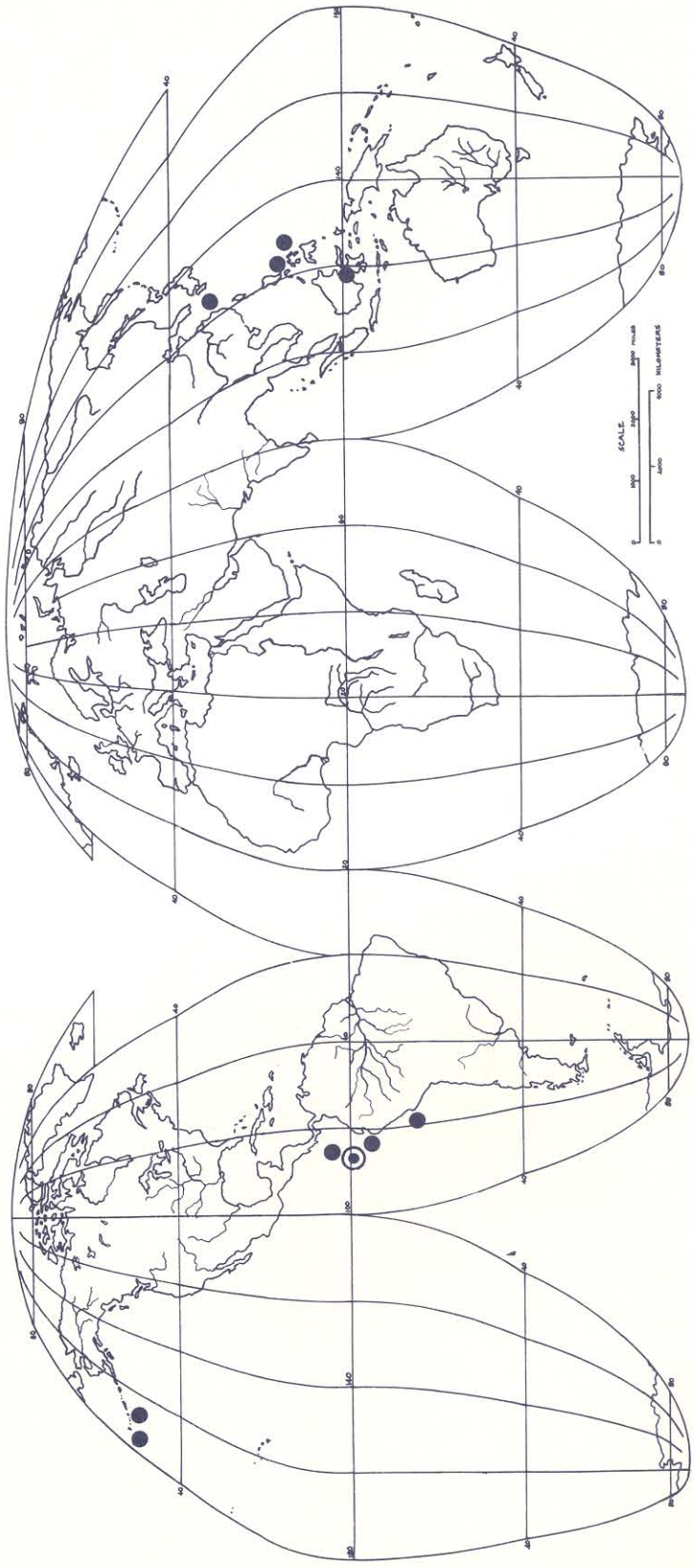

Figure 14. Distribution Records for *Aega (Rhamphion) plebeia* (solid dot), and *Aega (Rhamphion) longicornis* (circled dot).

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