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LEUCOLEPIDOPA SUNDA GEN. NOV., SP. NOV.
(DECAPODA: ALBUNEIDAE), A NEW INDO-PACIFIC
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ABSTRACT. *Leucolepidopa* gen. nov. is described along with the only known species in the genus, *Leucolepidopa sunda* sp. nov. The single specimen is from the Sunda Strait between Sumatra and Java. The position of this new genus is discussed and the relationships of all the genera within the family Albuneidae are reviewed. *Leucolepidopa* is most closely related to *Austrolepidopa* and *Lepidopa*.

The Danish Kei Island Expedition collected a single specimen of a new sand crab during dredging operations in the Sunda Strait between Sumatra and Java. This new crab is from an undescribed genus closely related to *Austrolepidopa*, recently described from Australia (Efford and Haig, 1968), and to an entirely American genus, *Lepidopa* (Efford, in ms.). In this paper I describe the new species and present a preliminary outline of the probable evolutionary relationships within the family so that the position of the new genus can be seen.

LEUCOLEPIDOPA GEN. NOV.

The type and only known species of this genus is *Leucolepidopa sunda*. This new genus is in the family Albuneidae and is closely related to *Austrolepidopa* and *Lepidopa*. It can be distinguished from other genera in the family by (1) the antennae having three articles in the flagellum and (2) the eyeplates possessing long setae on the dorsal surface. The following characters are not specific to the genus but can be used to separate it from others within the family: (3) a pleural expansion is present on the fifth abdominal segment; (4) the lateral spine is on the carapace and above the linea anomurica; (5) the scaphocerite is short, only just

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extending up to the base of the fourth antennal segment; (6) the rostrum is smoothly convex and lacks a subrostral spine; (7) there are no terminal spines on the anterolateral lobes; and (8) the anterolateral lobes carry six or seven teeth.

The generic name refers to the whiteness of the carapace and to the close relationship of this genus with the genera *Lepidopa* and *Austrolepidopa*.

LEUCOLEPIDOPA SUNDA SP. NOV.

Holotype. A male, 7mm carapace length and 8mm carapace width (Fig. 1, 1-8, and Fig. 2, 1-6). Collected on 29 July 1922 from 75° 6' 10" S, 105° 44' E in the Sunda Strait between Sumatra and Java, by the Danish Kei Island Expedition. The specimen was collected by dredging from a sand-shell bottom in 40 m of water. Deposited in the Zoologisk Museum, København.

The specific name *sunda* is derived from the name of the geographical location.

Description. The carapace has a rostrum that is gently rounded and lacks spines or teeth. It is flanked on either side by a shallow, gently curved ocular sinus and by rounded anterolateral lobes, the edges of which carry six or seven teeth. From the anterolateral lobes the anterior edge of the carapace curves backwards and outwards in a smooth sigmoid curve to the large, distinct, lateral spines. There are no spines along the anterior edge of the carapace as there are in most other members of the family. The edge is lined with long, branched setae, which gradually become shorter toward the lateral spines. From the lateral spines the carapace widens slightly back to the midline, behind which the edges are straight and converge. The posterior end of the carapace is smoothly rounded, with a deeply rounded medial concavity.

The carapace has an extensive pattern of setae. The basic pattern is similar to that of both *Austrolepidopa* and *Lepidopa*; the main difference is that the M-shaped pattern across the anterior end of the carapace extends up to the anterior edge and some way back along the sides. There is a smooth area in the middle of this pattern on either side. The setae in this area are longer than those on the posterior part of the carapace. Those lining the lateral spine groove are very long and branched, and extend beyond the anterior edge of the carapace. The posterior half of the carapace is almost equally setose, but here the setae

are in small groups rather than in one continuous expanse. In contrast, the posterior edge of the carapace, round the cavity, is free of setae and very smooth. The groove running down the side of the carapace stops before it reaches the posterior edge and does not follow the edge round as in *Lepidopa*.

The carapace is chalky white with some iridescence.

The first abdominal somite is shorter than wide, and the exposed posterior part forms a raised crescent-shaped area lined along its anterior edge by a dense row of setae. The second somite has broad pleural expansions with slightly concave anterior edges. The edges are lined with long setae that all face forward. Those along the lateral and posterior edges arise from a groove that runs round parallel with the edge. There are no setae along the edge of the central part of the plate. The third, fourth, and fifth segments are also winged, but unlike those of *Lepidopa*, all the pleural expansions are rather straight, narrowing towards the ends, and both the anterior and posterior edges of the expansions have grooves lined with forward-projecting setae. The setae near the outside tips of the pleural expansions of the fifth segment are particularly long and, in this case, project laterally, away from the abdomen. One noticeable character is the presence of distinct bumps along the posterior edge of the fourth pleural expansion. The sixth segment is shorter than wide and narrows towards the anterior edge. It has a distinct waist, and the posterior edge is lined with backward-projecting setae. The telson is broad and pear-shaped.

The eye-plate is quite distinct, as the dorsal surface is covered with long setae. In *Austrolepidopa* and *Lepidopa* the upper surface of the plate is smooth, although there may be setae around the edges. The plate is broadest about one third from the proximal end. The inner edge is fairly straight and the outer edge convex. From the broadest point the eyes narrow towards the rounded distal end. The edge of the plate is stepped, and long setae are attached at each step. No cornea or eye-spot is visible.

The antennules have a broad basal segment. The second segment is broad, partially compressed, and has a large, right-angled bulge on one side. The third segment is about as long as the second and widens towards the distal end. The two first antennule flagella of the holotype have been broken off so that their length is unknown; however, the lower part of the first flagellum suggests that in this species they are very long, as in *Lepidopa*. No second flagellum is present on the antennule.

The antennae are unusual because the setae are arranged terminally or along the inner side of the segments and they are not found scattered around on other parts as they are in other genera. This gives the antennae a rather bare appearance. The scaphocerite is very small and hardly overlaps the base of the fourth segment. It has a group of very long setae arising from the outer surface. The fifth segment is shorter than the fourth; it is cylindrical and terminates in a flagellum of three long cylindrical articles. The last article is longer than the other two. All three articles have areas of very long setae on their distal ends. In the holotype the setae are broken off the terminal article.

The mandible is strong, smoothly shaped, and carries a three-segmented palp. There is a very sharp cutting edge, two distinct teeth at the distal end, and three similar teeth at the proximal end. The maxillula was not examined. The maxilla is similar to those of others in the family, although I did not examine the scaphognathite. The first maxilliped is flattened and leaf-like; the endopod consists of two distinct segments. The second maxilliped is similar to others found in the family; the exopod is single and well developed. The third maxilliped has a very well-developed expansion of the anterodorsal end of the carpus, which extends over the propodus and reaches the junction of the propodus with the dactylus. The dactylus is over half as long as the propodus. The exopod is a single, long, cylindrical segment.

The pereiopods resemble those found in other members of the family. The first is subchelate with a sickle-shaped dactylus. The sides of the dactylus are smooth, and the upper surface is covered with long setae that point towards the proximal end of the segment. The propodus has a distinct cutting edge lined with very short, blunt setae and terminating in a large, hooked tooth. The side is covered with rows of long setae. The second and fourth pereiopods have broad, blunt, sickle-shaped dactyla. The third pereiopod has a long, smoothly-curved dactylus without any distinct basal projection; the carpus is very much expanded at the anterior end, with the anterior half of the upper surface covered with a dense mat of setae. The fifth pereiopod is long and chelate. The genital pore is round.

Relationships. To examine the relationships of *Leucolepidopa* with the other members of the family, I used characters that seem to vary little between species within a genus, although they do vary between genera. These were: (1) the number of articles in the flagellum of the antenna; (2) the presence or absence of pleural expansions on the fifth abdominal segment; (3) the

presence of the lateral spine above or below the linea anomurica; (4) the length of the scaphocerite; and (5) the shape of the rostral region of the carapace. When the genera are examined using these characters, it becomes clear that some of the characters always occur together. The presence of a pleural expansion on the fifth abdominal somite is always associated with a short scaphocerite and with a rostrum that is quite clearly convex in shape. The opposite three characters are associated with the absence of a pleural expansion on the fifth abdominal somite. These two groups can be used as the basis for separating the family into its evolutionary groups. I should mention here that *Blepharipoda* and *Lophomastix* are so distinct from the other genera in the family Albuneidae that they form a side branch off the main stream, and were not included in the analysis.

The family can be divided into three groups (Fig. 3). The first, the *Lepidopa* group, contains *Lepidopa*, *Austrolepidopa*, and *Leucolepidopa*. *Leucolepidopa* is most clearly related to *Austrolepidopa*, as shown by the similar shape of the eye-plates and by the stiff, straight, pleural expansions on the fifth abdominal somite compared to the rather delicate curved ones in *Lepidopa*. They differ in the length of the antennal flagellum, the presence of setae on the dorsal side of the eye-plate, the absence of a second flagellum to the antenna, and the setal pattern on the carapace. It is assumed that *Leucolepidopa* is more specialized than *Austrolepidopa*, as it has only three articles in the flagellum, whereas both of the other genera have seven or eight. *Austrolepidopa* is closely related to *Lepidopa*, as is shown by the similar lamellated eye-plates, the antennal flagellum of seven or eight articles, as well as the elongated carpus of the third maxilliped, short scaphocerite, pleural expansion, and convex rostrum common to the three species.

A second group, the *Albunea* group, has only two species, *Albunea* and *Stemenopa*. The former genus occurs throughout the tropical regions and is rather generalized in form. *Stemenopa*, recorded from only one location in Western Australia, is a very specialized form with extremely long eye-stalks. It closely relates to *Albunea*, as is shown by the absence of a pleural expansion on the fifth segment, the concave rostrum, and the long scaphocerite.

Zygopa is specialized in having both fused eye-plates and a single article in the antennal flagellum; it occupies a place somewhere between the other two groups. According to Holthuis (1960), it is more closely related to the *Lepidopa* group because of the position of the lateral tooth. Possibly more weight should

be put on its similarity to the *Albunea* group in its long scaphocerite, concave rostrum, and pleural expansion of the fifth abdominal segment, rather than its similarity to the *Lepidopa* group in having the lateral spine above the linea anomurica. Until we have more information, we must assume that a closer relationship is suggested by three characters held in common than by only one, which places *Zygopa* closer to the *Albunea* group than to the *Lepidopa* group.

The final group in the family is the rather separate off-shoot of *Blepharipoda* and *Lophomastix*.

Apart from the position of *Zygopa*, the genera fall rather easily into these separate groups. These relationships could be tested, and more information obtained to confirm or reject the tentative position of *Zygopa*, by comparing the larvae. At the present time, however, we know the larvae only of *Lepidopa* and *Blepharipoda*, so that we are still some way from understanding the evolution of the family Albuneidae.

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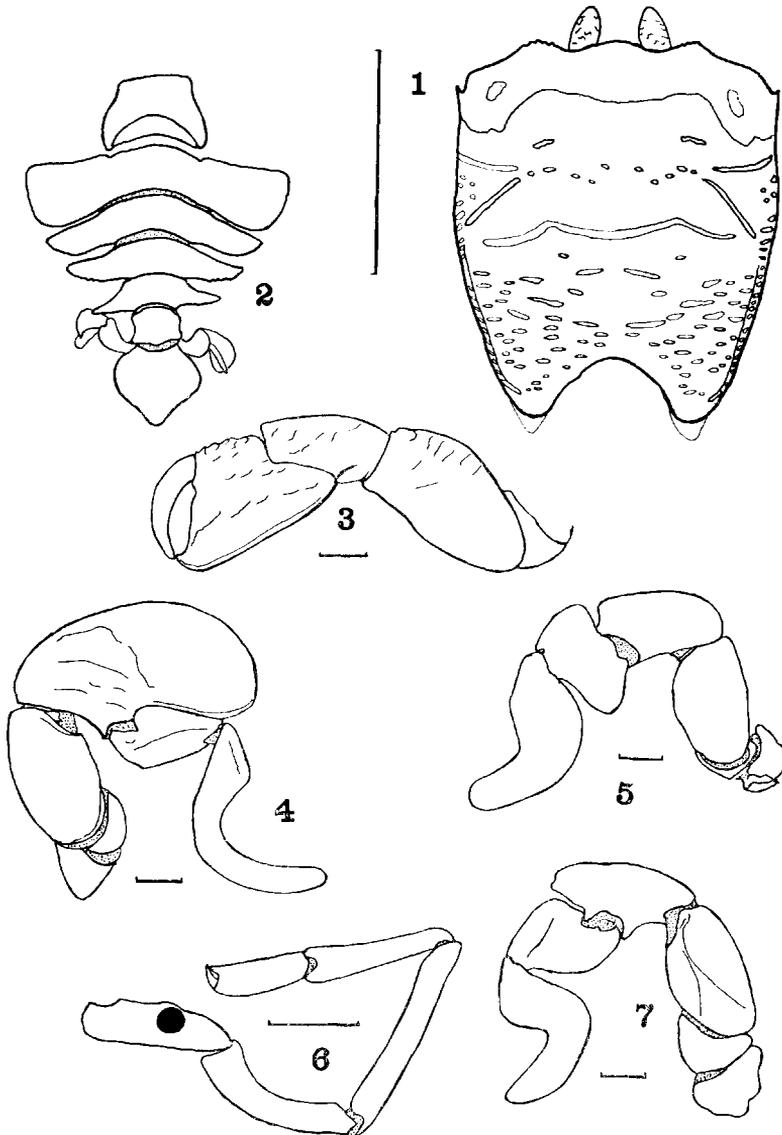


Fig. 1. Holotype of *Leucolepidopa sunda* gen. nov., sp. nov., male cl. 7 mm. 1. Dorsal view of the eye-plates and carapace with the setae pattern shown. 2. Dorsal view of the abdomen and telson. 3. Left first pereiopod. 4. Right third pereiopod. 5. Left fourth pereiopod. 6. Left fifth pereiopod showing round genital pore. 7. Left second pereiopod. Scale 1 mm, except in 1 and 2, where it is 0.5 cm.

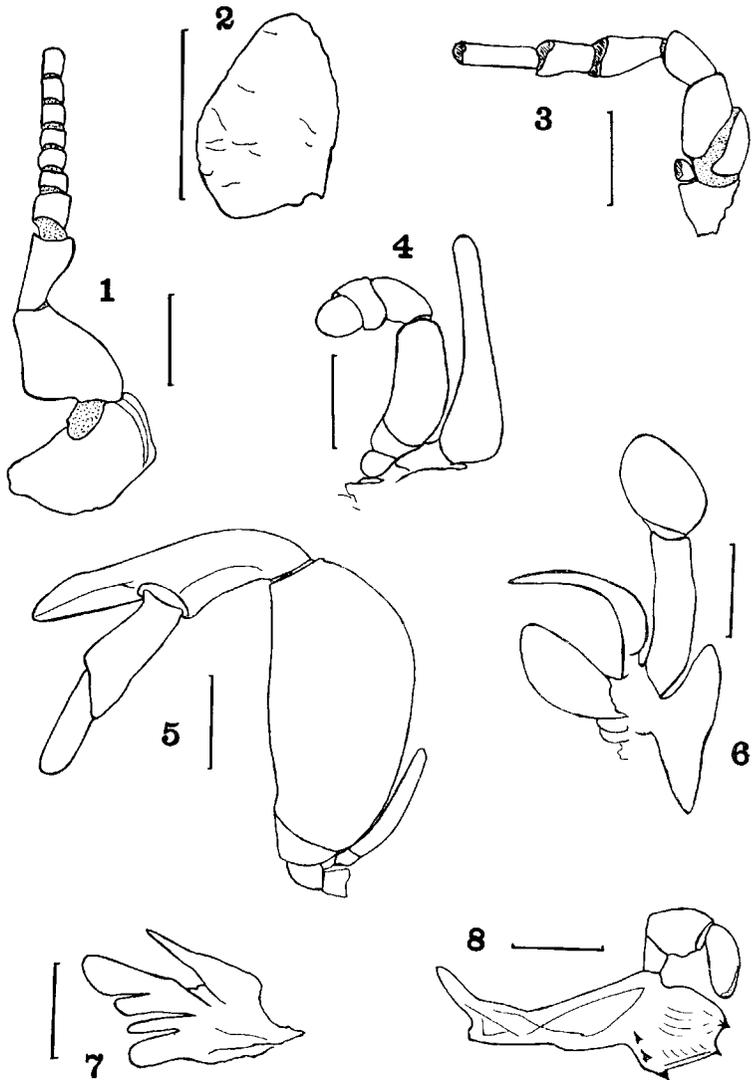


Fig. 2. Holotype of *Leucolepidopa sunda* gen. nov., sp. nov. 1. Base of antennule. 2. Dorsal view of left eye-plate. 3. Left antenna. 4. Left second maxilliped. 5. Left third maxilliped. 6. Left first maxilliped. 7. Left maxilla with the scaphognathite missing. 8. Left mandible. Scale 1 mm.

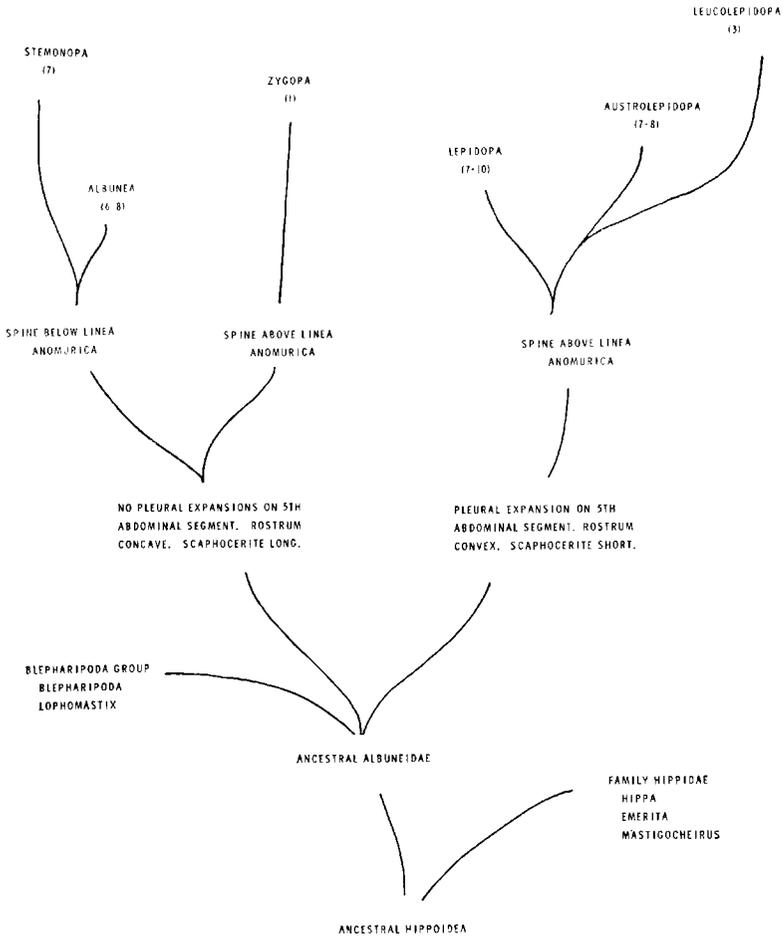


Fig. 3. Evolutionary relationships within the family Albuneidae. Number of articles on the antennal flagellum is given for each genus.