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CONTRIBUTIONS TO THE KNOWLEDGE OF THE ALPHEID SHRIMP  
OF THE PACIFIC OCEAN  
PART XIV. A REVIEW OF *PRIONALPHEUS* (DECAPODA, ALPHEIDAE)  
WITH THE DESCRIPTION OF TWO NEW SPECIES

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BY

ALBERT H. BANNER and DORA M. BANNER  
Department of Zoology, University of Hawaii, Honolulu, Hawaii, U.S.A.

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PART XIV. A REVIEW OF *PRIONALPHEUS* (DECAPODA, ALPHEIDAE)  
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ALBERT H. BANNER and DORA M. BANNER

Department of Zoology, University of Hawaii, Honolulu, Hawaii, U.S.A.

The genus *Prionalpheus* Banner & Banner was described in 1960 on the basis of three specimens, two from Fiji and one from Tahiti. As the specimens were incomplete, and two possibly immature, the genus was described with some doubts despite its unique characteristics, and one of the two species placed in the genus was left unnamed because of the fragmentary condition of the specimens.

However, in our collections from Zamboanga and Jolo in the southern Philippines we have found a series of complete specimens of a third species of this genus, and a reexamination of Coutière's (1908) type and only specimen of *Alpheopsis fissipes* shows it also belongs to this genus. On the basis of these we review the genus.

We wish to thank Dr. J. Forest of the Muséum National d'Histoire Naturelle in Paris for the loan of Coutière's type specimens of *Alpheopsis fissipes* and *Alpheopsis idiocarpus*. Our work was supported in part by a National Science Foundation grant, GB6386.

***Prionalpheus* Banner & Banner**

*Prionalpheus* Banner & Banner, 1960: 292.

Diagnosis. — General form of body, orbital hoods and appendages similar to *Alpheopsis*, but distinguished from *Alpheopsis* by the highly modified mouthparts. Mandible without palp and molar process, and with incisor process asymmetrically developed into long, sharp teeth-like processes on one side, and either somewhat similar teeth or with rounded processes on the other. Maxillules with middle lobe variously expanded, inner lobe bearing several to many strong spines, outer lobe somewhat reduced. Maxilla reduced, with endites reduced or absent, palp present, scaphognathite reduced. First maxilliped with coxal endite probably present in all species, but joined to enlarged basal endite; endopod without articulations; exopod long and well developed, but also without articulations; epipodite reduced. Second maxilliped with endopod united with basipod, and of three or possibly four articles, with penultimate article rounded and expanded, ultimate

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article greatly reduced. Third maxillipeds of form normal for the family. Large chelipeds moderately heavy, symmetrical, carried extended, with simple armature on fingers, with development reminiscent of *Alpheopsis equalis* Coutière. Carpus of second leg with three to five articles. Third legs slender, with biunguiculate dactyli in all species known. Sixth abdominal segment with articulated pleura. Outer uropod with shoulder bearing a strong movable spine, and 2-5 teeth. Telson normal for the family.

Branchial formula with 5 pleurobranchs, no arthrobranchs, and epipodites on only first and second maxilliped.

Type species: *Prionalpheus triarticulatus* Banner & Banner, 1960.

#### KEY TO THE SPECIES OF PRIONALPHEUS

1. Carpus of second legs with 5 articles . . . . . *P. fuscipes* (Coutière, 1908)
- Carpus of second legs with less than 5 articles . . . . . 2
2. Carpus of second legs with 4 articles . . . . . 3
- Carpus of second legs with 3 articles . . . . . *P. triarticulatus* Banner & Banner, 1960
3. Base of rostrum broad, joining orbital hoods in a confluent curve; upper unguis of dactyl of third leg larger than lower . . . . . *P. brachytomens* n. sp.
- Base of rostrum narrow, with anterior margin of carapace between orbital hoods and rostrum transverse and straight; upper unguis of dactyl of third legs narrower than lower . . . . . *P. salu* n. sp.

Discussion. — In addition to the four species reported below, we reexamined the type specimen of *Alpheopsis idiocarpus* Coutière. Although it resembles this genus in its general form, and particularly in the reduction in articles of the carpus of the second leg, its mouthparts are usual for *Alpheopsis* and the family.

TABLE I  
Comparison of the species of *Prionalpheus*

	I	II	III	IV
Characteristic	<i>P. triarticulatus</i>	<i>P. brachytomens</i>	<i>P. fuscipes</i>	<i>P. salu</i>
Rostral shape	Demarked from orbital hoods	Confluent with orbital hoods	As in I	As in I
Tooth at antennular base	Present	Absent	Present slender and acute	As in III
Pterygostomial spine	Extended, acute	Not extended, sub-acute	As in I	Slight extension, acute
Squamous portion scaphocerite	To middle third antennular article	To end of second antennular article	To end of third antennular article	As in II
Anterior tooth, left mandible	4 times length of middle teeth	1.5 times length of middle teeth	As in I (?)	2 times length of middle teeth
Maxillule, middle lobe	Expanded	Narrow	Expanded	Narrow
Third maxilliped, setae of distal article	Shorter than distal article	Longer than article	As in II	As in II
Carpus, second legs	3 articles	4 articles	5 articles	4 articles
Ungues of third legs	Upper larger	Upper smaller	As in I	As in I
Shoulder of outer uropod	With 3 weak teeth	With 3 strong teeth	With 2 weak teeth	With 6 strong teeth

The four known species are separated by the key above and by table I. An interesting feature found in all species, except for *P. brachytomens*, is the presence of teeth on the sclerite at the base of the antennular peduncle. These are medial to the antennular base and may be carried on a separate sclerite (see fig. 1B, b).

Nothing is known about the ecology of these species. Our three species were all collected in relatively shallow water, but Coutière's came from 100 to 150 meters deep. The rather extensive collections of *P. sulu* give no clue to specific habitats, for all occurred in general collections from dead coral heads that yielded up to 20 or more species of alpheid. None were noted as coming from specialized habitats such as sponges. Consequently, the function of the unique mouthparts

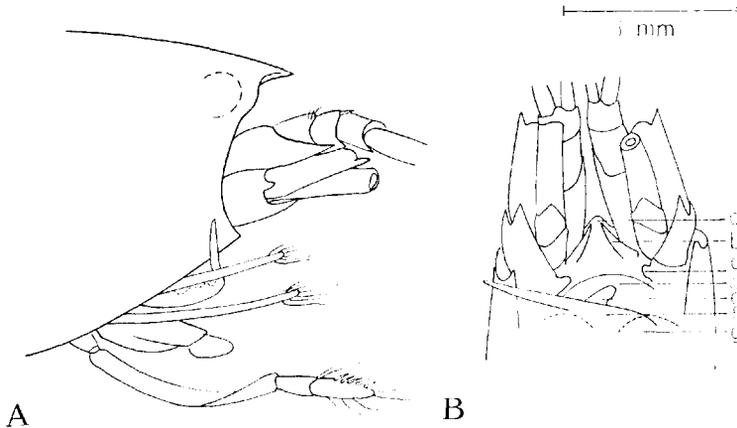


Fig. 1. *Prionalpheus fissipes* (Coutière). A, anterior region, lateral view; B, anterior region, ventral view. (a, ocular beak; b, extra teeth; c, excretory pores on antennal base; d, labrum; e, rounded portion of right mandible; f, tooth of left mandible; g, (dotted) second maxilliped).

cannot be even subjected to conjecture, although it is certain that the food habits of these shrimp must be radically different from those of other genera of the alpheid.

### ***Prionalpheus triarticulatus* Banner & Banner**

*Prionalpheus triarticulatus* Banner & Banner, 1960: 293, fig. 1.

Diagnosis. -- Rostrum with base relatively narrow, sharply demarcated from ocular hoods. Scaphocerite with lateral spine reaching beyond end of antennular article. Pterygostomial angle extended and acute. Left mandible with anterior tooth almost four times length of middle three teeth; posterior tooth heavy, twisted, but acute. Right mandible with anterior tooth curved to form an almost completed cylinder. Maxillules with middle lobe enlarged and broadly expanded, inner lobe bearing two strong spines. Basal article of endopod of second maxilliped possibly with diagonal articulation. Second legs with carpus of three articles. Dactylus of third legs with inferior unguis heavier and shorter than superior. Heavy spine of shoulder of outer uropod flanked by 3 teeth about one-third length of lateral spine.

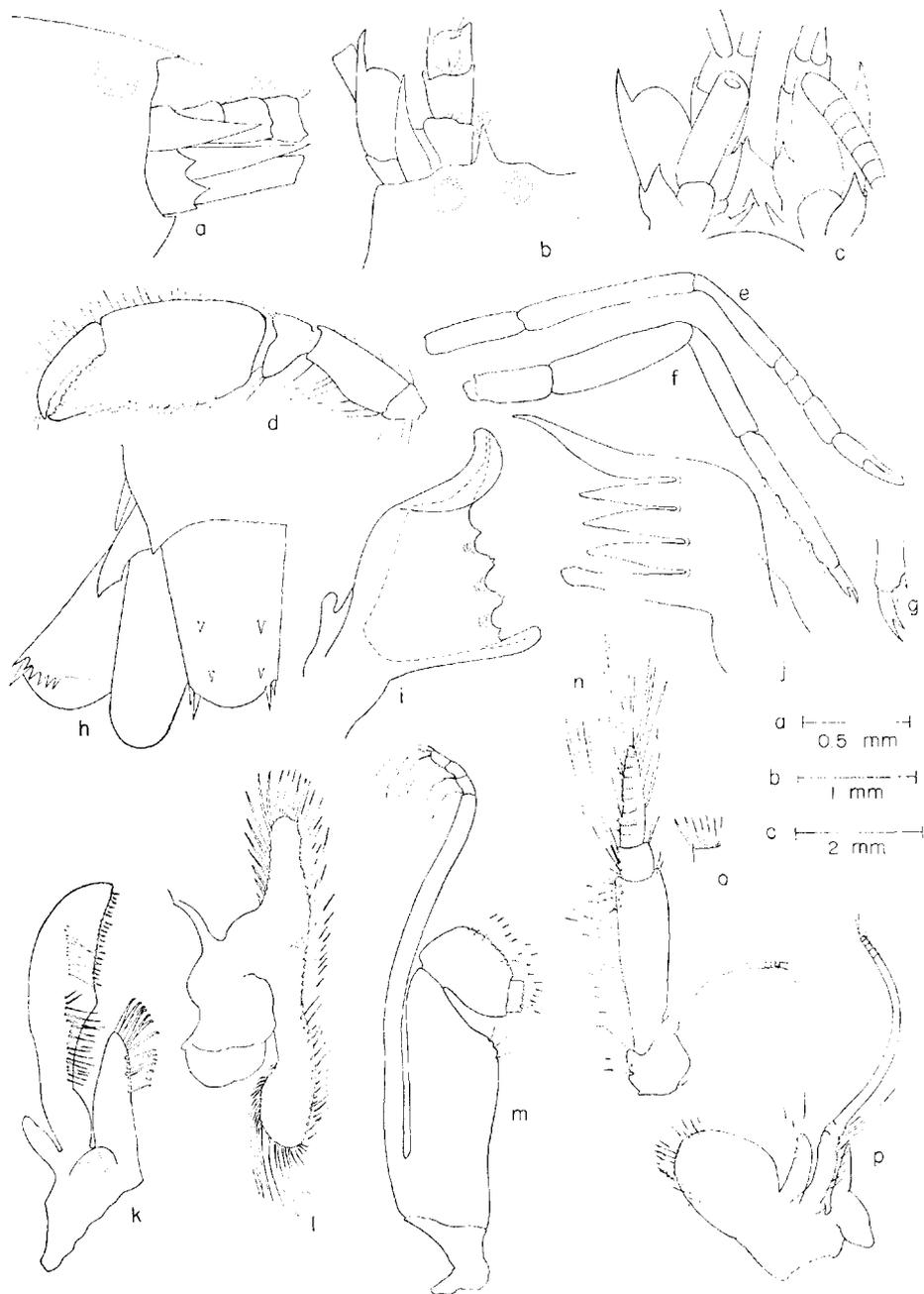


Fig. 2. *Prionalphes silu* n. sp. a, b, c, anterior region, lateral, dorsal and ventral views; d, large cheliped; e, second leg; f, third leg; g, third leg dactylus, enlarged; h, telson and uropod; i, j, right and left mandible; k, first maxilla; l, second maxilla; m, second maxilliped; n, third maxilliped; o, detail of spines of third maxilliped; p, first maxilliped. (i, j, k, l, m, n, o, p, Scale a; a, b, c, e, f, h, Scale b; d, Scale c).

Type and only specimen known collected from middle of reef flat at Korolevu, Vitilevu, Fiji; non-ovigerous female 10.7 mm long. [Type specimen lost, see: Banner & Banner, 1962].

**Prionalpheus brachytomeus** sp. nov.

*Prionalpheus* sp. Banner & Banner, 1960: 296, fig. 2.

Type specimen. — An ovigerous female 10.6 mm long collected at outer edge of fringing reef at Korolevu, Vitilevu, Fiji. [Type specimen lost, see: Banner & Banner, 1962].

Diagnosis. — Rostrum formed by confluence of curve of anterior margin of carapace starting with outer margin of orbital hoods and terminating in rostral tip. Lateral spine of scaphocerite reaching near end of third antennular article, squamous portion to end of second article. Pterygostomial angle subacute and not extending as a tooth. Anterior awl-shaped tooth of left mandible only twice length of adjacent teeth, posterior tooth heavy and rounded. Middle lobe of maxillule of near normal shape, not expanded; inner lobe with numerous strong, hooked setae. Basal article of endopod of second maxilliped joined to basipodite and without trace of articulation. First legs unknown. Carpal articles of second legs 4 in number and with the ratio: 10 : 3.6 : 1.8 : 4.4. Dactylus of third legs with superior unguis more slender than, but approximately equal in length to inferior. Shoulder of outer uropod bearing strong spine flanked by three additional teeth of about two-thirds the length of lateral spine.

Two broken specimens known, both females (one ovigerous 10.6 mm long) from Tahiti and Vitilevu.

The name refers to the short incisor-like teeth on the mandible.

**Prionalpheus fissipes** (Coutière) (fig. 1)

*Alpheopsis fissipes* Coutière, 1908: 3; Coutière, 1921: 414, pl. 60 fig. 3 [no additional description, only new figures].

Diagnosis. — Rostrum demarked from anterior margin of carapace, but with curve of base confluent with margin. Spine of scaphocerite reaching slightly beyond end of antennular peduncle, squamous portion reaching near end. Pterygostomial angle subacute, not projecting. Left mandible with anterior tooth elongate, reaching beyond pterygostomial angle of carapace. Maxillule with middle lobe expanded, inner lobe bearing two strong spines. Second maxilliped similar in general form to that of *P. triarticulatus*, with possible diagonal articulation in basal article of endopod. First legs unknown. Carpal articles of second legs with the ratio 10 : 5 : 5 : 4 : 5. Dactylus of third leg with inferior unguis markedly shorter and much heavier than the superior. Lateral spine on shoulder of outer uropod strong, extending beyond tip of uropod, and flanked by two shorter teeth.

Type and only specimen, a 6.5 mm ovigerous female taken from 50-78 fathoms, from Providence, Dependency of Seychelles.

Discussion. — As the type is the only specimen of this species, its mouthparts were not dissected in our reexamination. However, enough could be seen by

displacing the outer maxillipeds to confirm that this species has the highly developed teeth on the mandibles, and the expanded maxillules quite similar to *P. triarticulatus*. This species is distinguished from all others of the genus by having 5 articles in the carpus of the second legs; there may be an ecological distinction as well, for while the other three species were collected on the reef flat or in shallow water, this species came from between 100-150 meters.

***Prionalpheus sulu* sp. nov. (fig. 2)**

Holotype. — 10.5 mm male from eastern end of Big Santa Cruz Island, Zamboanga, Mindanao. From dead coral head in 10 feet of water. Deposited in the Bishop Museum, Honolulu, Hawaii, Mar. Zool. Coll. nr. S-7872.

Allotype. — 12.0 mm ovigerous female from same locality as type.

Paratypes. — 7 more specimens 9-12 mm in length from the same collection as the types; 4 specimens from Marungus Island, off Jolo Island, Southern Philippines, 8-11 mm in length, collected from dead coral in water from 6-12 feet deep.

Diagnosis. — Rostrum narrow, about 2 times as long as broad at the base, laterally curving to front of orbital hoods; tip reaching to end of first antennular article and bearing two long and several shorter hairs. Orbital hoods not inflated, front slightly convex.

Articles of antennular peduncle short and heavy, sub-equal in length and almost as broad as long. Sharp tip of stylocerite reaching to near end of second antennular article. First antennular article with strong tooth on inferomedial distal margin. Lateral margin of scaphocerite slightly convex; lateral spine greatly exceeding squamous portion, reaching well beyond end of antennular peduncle, while squamous portion reaches slightly beyond end of second antennular article. Carpcerite equal in length to antennular peduncle, lateral spine of basicerite acute and broad. Pterygostomial angle somewhat projecting and acute. Sclerite at base of antennular peduncle, on inferomedial side, projecting as short acute tooth, smaller than that shown for *P. fissipes* (fig. 1).

Left mandible with four long sharp teeth and one rounded tooth and no trace of molar portion or palp. Antermost tooth almost 2 times length of adjacent teeth, curved and reaching to slender acute tip; three center teeth of uniform development, about 4 times as long as broad at the base; posterior tooth rounded, slightly knobbed on end, and 1.4 times length of central teeth. Right mandible fitting exactly with long teeth of left mandible, with anterior projection curved to form an incomplete tube in which the long tooth of left mandible fits; three middle teeth of left mandible fitting between four low irregular projections; posterior tooth of left mandible fitting into somewhat curved posterior projection of right mandible.

Maxillules of symmetrical development, inner lobe rounded and bearing numerous heavy setae, somewhat hooked on end. Middle lobe over twice as long as inner lobe, laterally convex, medial margin with two concave curves, the distal being armed with short spine-like setae, proximal portion (but not margin) armed

with heavier and longer setae. Outer lobe less than half as long as inner lobe, unarmed and rounded. Total length of maxillae about the same as of the maxillules. Endites not developed; palp small, without articulations; scaphognathite with posterior lobe over 3 times as long as broad, and all free margins bearing strong setae.

First maxilliped with a trace of division between the coxal and basal portions of rounded endite; endite bearing only light setae; endopod without articulations, bearing 3 heavier setae; exopod about 5 times length of endopod, with a few heavy setae on base and lighter setae on tip; epipodite reduced. Second maxilliped with possible articulation between coxa and basis, but with no articulations between basis and exopod or endopod; endopod carrying two articles distally, middle article as long as proximal article is broad, distal surface rounded; distal article rectangular, 2.5 times as broad as long; both middle and distal articles bearing stiff spines. Third maxilliped with exopod 0.7 length of proximal article of endopod; middle article of endopod 0.2, distal article 0.7 length of basal article. Basis bearing two strong spines; proximal article of endopod with 6 spines and numerous fine setae; both middle article and distal article carrying heavy tufts of long setae, distal article also with rows of short, stiff spines.

Chelipeds symmetrical, not sexually dimorphic. Chelae compressed, 2.0 times as long as broad, with fingers occupying distal 0.3. Palmar faces smooth, without sculpture, but with lower margin set with tufts of setae directed forward. Fixed finger with margin armed with irregularly rounded teeth and bearing row of short setae; dactylus with similar teeth, but of lesser development. Carpus cup-shaped. Merus slender 2.3 times as long as broad, without teeth and bearing long slender spines.

Carpus of second legs with 4 articles of the ratio 10 : 2.2 : 2.2 : 3.7.

Third leg with ischium unarmed. Merus unarmed, 4.0 times as long as broad. Carpus 0.6 length of merus. Propodus slightly longer than merus, inferior margin bearing 7 spinules. Dactylus biunguiculate, with ungues equal in breadth at base, but with superior unguis longer than inferior.

Shoulder of outer uropod with heavy spine and 6 teeth, the outermost about half as long as spine, others only slightly shorter. Telson 2.3 times as long as posterior margin is broad; lateral margins straight, posterior margin moderately arcuate; posterolateral spines and dorsal spines well developed.

Branchial formula as for genus.

The name refers to the type locality.

Discussion. - There is little variation in the 13 specimens. The ratio of the carpoerite to the antennular peduncle in our specimens varied from a little longer to a little shorter than that of the type. The length of the rostrum varied also from a little shorter to a little longer than that of the type. The teeth on the opposing surface of the fixed finger of the large chela varied from small serrations to the rounded irregular teeth found on the type.

## RÉSUMÉ

Une révision du genre d'Alpheidae, *Prionalpheus* Banner & Banner, caractérisé par des mandibules dentées et des appendices buccaux très modifiés, est présentée ici. Un nom spécifique, *P. brachytomus*, est appliqué à une espèce des Fiji, une nouvelle espèce des Philippines du Sud, *P. sulu*, est décrite, et l'espèce reconnue antérieurement comme *Alpheopsis fissipes* Coutière est attribuée à ce genre, qui compte ainsi quatre espèces en tout. Un réexamen d'*Alpheopsis idiocarpus* Coutière a montré que cette espèce ne fait pas partie de ce genre.

Toutes les espèces connues viennent de la région Indo-Pacifique tropicale et sont associées aux coraux; presque rien d'autre n'est connu de leur écologie.

## REFERENCES

- BANNER, ALBERT H. & DORA M. BANNER, 1960. Contributions to the knowledge of the alpheid shrimp of the Pacific Ocean, 6. *Prionalpheus*, a new genus of the Alpheidae. *Pacific Sci.*, **14** (3): 292-298, figs. 1-2.
- & —, 1962. Contributions to the knowledge of the alpheid shrimp of the Pacific Ocean, 8. Losses of specimens in the fire of the Hawaii Marine Laboratory. *Pacific Sci.*, **16** (2): 238-240.
- COUTIÈRE, H., 1908. Sur quelques nouvelles espèces d'Alpheidae. *Bull. Soc. philomath. Paris*, (9) **11** (5): 1-25.
- , 1921. Les espèces d'Alpheidae rapportées de l'Océan Ind'en par M. J. Stanley Gardiner. *Trans. Linn. Soc. London*, (2) **17** (4): 413-428, pls. 60-61.