

## Redescription of *Squilla fabricii* Holthuis, 1941 (Crustacea: Stomatopoda), and its transfer to *Oratosquilla* Manning, 1968

Shane T. Ahyong

Department of Marine Invertebrates, Australian Museum, 6 College St., Sydney, NSW 2010, Australia, Email: shanea@austmus.gov.au

*Abstract.*—The holotype of *Squilla fabricii* Holthuis, is redescribed and transferred from *Oratosquillina* Manning to *Oratosquilla* Manning. Additionally, *O. fabricii* is shown to be a senior synonym of *O. calumnia* (Townsend). Characters previously used to distinguish *O. fabricii* (as *O. calumnia*) from *O. mauritiana*, namely the spination of the first abdominal somite and the shape of the anterior lobe on the lateral process of the seventh thoracic somite are, unreliable. The best character distinguishing *O. fabricii* from *O. mauritiana* is the pitted versus smooth dorsal integument. A key to species of *Oratosquilla* is provided.

Since it was first described from Indonesia, *Squilla fabricii* Holthuis, 1941, presently known as *Oratosquillina fabricii* (Holthuis 1941), has been reported only by Stephenson (1962). The specimen reported by Stephenson (1962) as *Squilla fabricii*, however, was shown by Ahyong & Norrington (1997) to be a superficially similar species, *Oratosquillina asiatica* (Manning 1978).

Reexamination of the holotype of *Oratosquillina fabricii* shows not only that it belongs in the genus *Oratosquilla*, but also that it is a senior synonym of *Oratosquilla calumnia* (Townsend 1953), a species with a wide Pacific distribution. The confusion over the identity and generic placement of *Oratosquilla fabricii* is largely the result of an error in the type description which attributed an interrupted instead of uninterrupted anterior bifurcation to the median carina of the carapace (Holthuis 1941). The condition of the anterior bifurcation of the median carina of the carapace, whether interrupted or uninterrupted basally, is an important character distinguishing species groups and genera among squilloids (Manning 1971, 1978, 1995). Consequently, *Oratosquilla fabricii* has always been associ-

ated with the species in the ‘*perpensa*’ and ‘*gonypetes*’ groups of *Oratosquilla* (see Manning 1978), each of which were subsequently transferred to the genus *Oratosquillina* Manning, 1995. Thus, the conspecificity of *O. fabricii* and *O. calumnia* has likely escaped detection until now because both have been placed in different species groups or genera. All published records of *Oratosquilla calumnia* are now referable to *O. fabricii*. Four species of *Oratosquilla* are recognized here: *O. fabricii* (Holthuis 1941), *O. kemp*i (Schmitt 1931), *O. mauritiana* (Kemp 1913), and *O. oratoria* (de Haan 1844).

Several major studies of Indo-West Pacific stomatopods are presently in progress, each of which includes material of, or refer to *O. fabricii*. Rather than await completion of those works to correct the nomenclature, however, the present note serves to clarify the taxonomic status of both species in order to simplify the nomenclatural discussion in forthcoming works and to minimize perpetuation of errors in the taxonomic literature.

The holotype of *O. fabricii* is deposited in the Zoological Museum, Amsterdam (ZMA). All measurements are in millimeters (mm). Total length (TL) is measured along

the midline from the tip of the rostrum to the apices of the submedian teeth of the telson. Carapace length (CL) is measured along the midline and excludes the rostral plate. Corneal index (CI) is given as 100 times CL divided by cornea width. Other abbreviations used in this account include: antennule (A1); antenna (A2); abdominal somite (AS); thoracic somite (TS); maxilliped (MXP); median (MD); submedian (SM); intermediate (IM); lateral (LT); marginal (MG).

Family Squillidae Latreille, 1803  
Genus *Oratosquilla* Manning, 1968  
*Oratosquilla fabricii* (Holthuis 1941)  
Fig. 1

*Squilla nepa*.—Brooks, 1886: 25 [part, see remarks; not *S. nepa* Latreille, 1828].

*Squilla oratoria*.—Kemp, 1913:66–72 [part, see remarks].—Edmondson, 1921: 287, fig. 1a.—Bigelow, 1931:183–186.—Townsend, 1953:404–406, figs. 2–3 [not *S. oratoria* De Haan].

*Squilla fabricii*.—Holthuis, 1941:249–253, fig. 1 [type locality: Telok Dalam, Nias, Indonesia].

*Squilla calumnia*.—Townsend, 1953:410, figs. 8, 9 [type locality: Hilo, Hawaii].

*Oratosquilla calumnia*.—Manning, 1971: 4–6, fig. 1.—Ahyong & Norrington, 1997:107.—Moosa, 1991:210–211.—Poupin, 1998:37.

*Oratosquilla fabricii*.—Manning, 1978:7, 11.

*Oratosquillina fabricii*.—Manning, 1995: 25, 225, 227.

*Oratosquilla mauritiana*.—Garcia, 1981: 24–26 [not *O. mauritiana* (Kemp 1913)].

*Busquilla quadraticauda*.—Poupin, 1998: 37 [not *B. quadraticauda* (Fukuda 1911)].

Not *Squilla fabricii*.—Stephenson, 1962: 107–108 [= *Oratosquillina asiatica* (Manning 1978)].

*Material*.—Holotype: ZMA, female (TL 128 mm), Telok Dalam, Nias, Indonesia, coll. Kleiweg de Zwaan.

*Description of holotype*.—Dorsal integument distinctly pitted, rugose.

Eye extending beyond midlength but not apex of A1 peduncle segment 1; cornea strongly bilobed, set obliquely on stalk; CI 448. Ophthalmic somite anterior margin faintly emarginate. Ocular scales truncate, separate.

A1 peduncle 0.83 CL. A1 somite with dorsal processes trianguloid, directed anterolaterally, apices pointed but blunt. A2 scale 0.63 CL.

Rostral plate trapezoid, broader than long, lacking median carina. Carapace anterior width 0.49 CL; anterolateral spines not extending beyond base of rostral plate; with MD, IM, LT, MG and reflected MG carinae; MD carina distinct, not interrupted at base of anterior bifurcation; branches of anterior bifurcation distinct, opening anterior to dorsal pit; posterior median projection distinct, obtuse.

Raptorial claw dactylus with 6 teeth, outer margin sinuous, proximal margin lacking basal notch; carpus carina tuberculate; propodus distal margin unarmed; merus outer inferodistal angle acute.

Mandibular palp 3-segmented. MXP1–4 each with epipod. MXP5 basal segment with ventrally directed spine. Pereiopod 1–3 basal segments unarmed; endopod segments fused, styliform.

TS6–8 with distinct SM and IM carinae. TS5 lateral process bilobed; anterior lobe a slender spine directed anteriorly; posterior lobe short, directed laterally. TS6–7 lateral process distinctly bilobed. TS8 anterolateral margin triangular, apex sharp; sternal keel rounded.

AS1–5 with distinct SM, IM, LT, and MG carinae. SM carinae parallel on AS1–5. AS6 with SM, IM, and LT carinae; with small ventral spine anterior to uropodal articulation; sternum posterior margin unarmed; lacking transverse carinae. Abdominal carinae spined as follows: SM 4–6, IM 2–6, LT 1–6, MG 1–5.

Telson flattened, subquadrate, slightly broader than long; with 3 pairs of primary teeth (SM, IM, LT), each with dorsal carina; SM teeth with fixed apices; prelateral lobe

shorter than margin of LT tooth; MD carina interrupted proximally, with short posterior spine; dorsolateral surface with curved rows of shallow pits; lacking supplementary longitudinal carinae; denticles rounded, each with dorsal tubercle, SM 4, IM 8, LT 1. Telson ventral surface with short postanal carina; ventrolateral carina short.

Uropodal protopod terminating in 2 slender spines, with lobe on outer margin of inner spine rounded, narrower than adjacent spine; with minute ventral spine anterior to endopod articulation; protopod inner margin crenulate. Uropodal exopod proximal segment shorter than distal segment; with 8 movable spines on outer margin.

*Measurements of holotype.*—TL 128 mm, CL 26.9 mm, cornea width 6.0 mm, A1 peduncle 22.2 mm, A2 scale 16.9 mm.

*Remarks.*—The holotype of *Oratosquilla fabricii* agrees well with the account of *O. calumnia* given by Manning (1971), but differs in lacking a posterior spine on the intermediate carina of AS1, and in bearing a broader anterior lobe on the lateral process of TS7. The two paratypes of *Oratosquilla fabricii*, one from ?Lombok, Indonesia, and the other from an unknown locality, were not studied. Inasmuch as Holthuis (1941) attributed an interrupted anterior bifurcation of the median carina of the carapace to *O. fabricii*, the paratypes may be referable to *Oratosquillina asiatica* which also occurs in Indonesia (Ahyong & Norrington 1997). Specimens reported as *O. calumnia* from New Caledonia (Moosa 1991), Fiji (Ahyong & Norrington 1997), and the Marquesas (Ahyong, unpublished data) show variation in both of these traits: the intermediate carina of AS1 may or may not be armed, and the anterior lobe of the lateral process of TS7 varies from rounded to sharp. Although the holotype of *O. calumnia* is a juvenile (TL 26 mm), large growth series of the species from the Marquesas fully corroborate Manning's (1971) association of the juvenile holotype with adults. Poupin's (1998) record of *Busquilla quadraticauda* (Fukuda 1911) from Tahiti, Society Islands, is based on a

juvenile of *O. fabricii*. Brooks (1886) reported a specimen of *O. fabricii* from Honolulu, Hawaii, as *Squilla nepa*.

Manning (1971) remarked on the close similarity between *O. mauritiana* from the western Indian Ocean and *O. fabricii* (as *O. calumnia*) from the Pacific. In *O. mauritiana*, the intermediate carina on AS1 is always unarmed and the anterior lobe of the lateral process of TS7 is always blunt. In *O. fabricii*, however, the intermediate carina of AS1 may or may not be armed and the anterior lobe of the TS7 lateral process is usually triangular, but may be blunt and obtuse. Thus, the primary characters used by Manning (1971, 1995) to distinguish the two species have limited diagnostic value. Both Kemp (1913) and Manning (1971), however, remarked on the smooth dorsal integument of *O. mauritiana*, and this appears to be the most reliable character distinguishing it from *O. fabricii*, which is pitted and rugose. I have not examined Moosa's (1991) material from New Caledonia, but the holotype of *O. fabricii*, the specimen from Fiji reported by Ahyong & Norrington (1997) as *O. calumnia*, as well as specimens identifiable with *O. calumnia* in the National Museum of Natural History, Smithsonian Institution, bear distinctly pitted dorsal integument. *Oratosquilla mauritiana* reported by Garcia (1981) from the Philippines is referable to *O. fabricii* as it bears a triangular anterior lobe on TS7; that lobe is always blunt in *O. mauritiana*.

*Distribution.*—Pacific Ocean from Hawaii, French Polynesia, Guam, Fiji, New Caledonia, Indonesia, and the Philippines, at depths of 5–50 m.

#### Key to species of *Oratosquilla*

1. Raptorial claw merus lacking outer inferodistal spine . . . . . *O. kempfi*
- Raptorial claw merus with outer inferodistal spine . . . . . 2
2. SM carinae of AS4 unarmed . . . . . *O. oratoria*
- SM carinae of AS4-6 each with posterior spine . . . . . 3
3. Dorsum integument smooth, not punc-

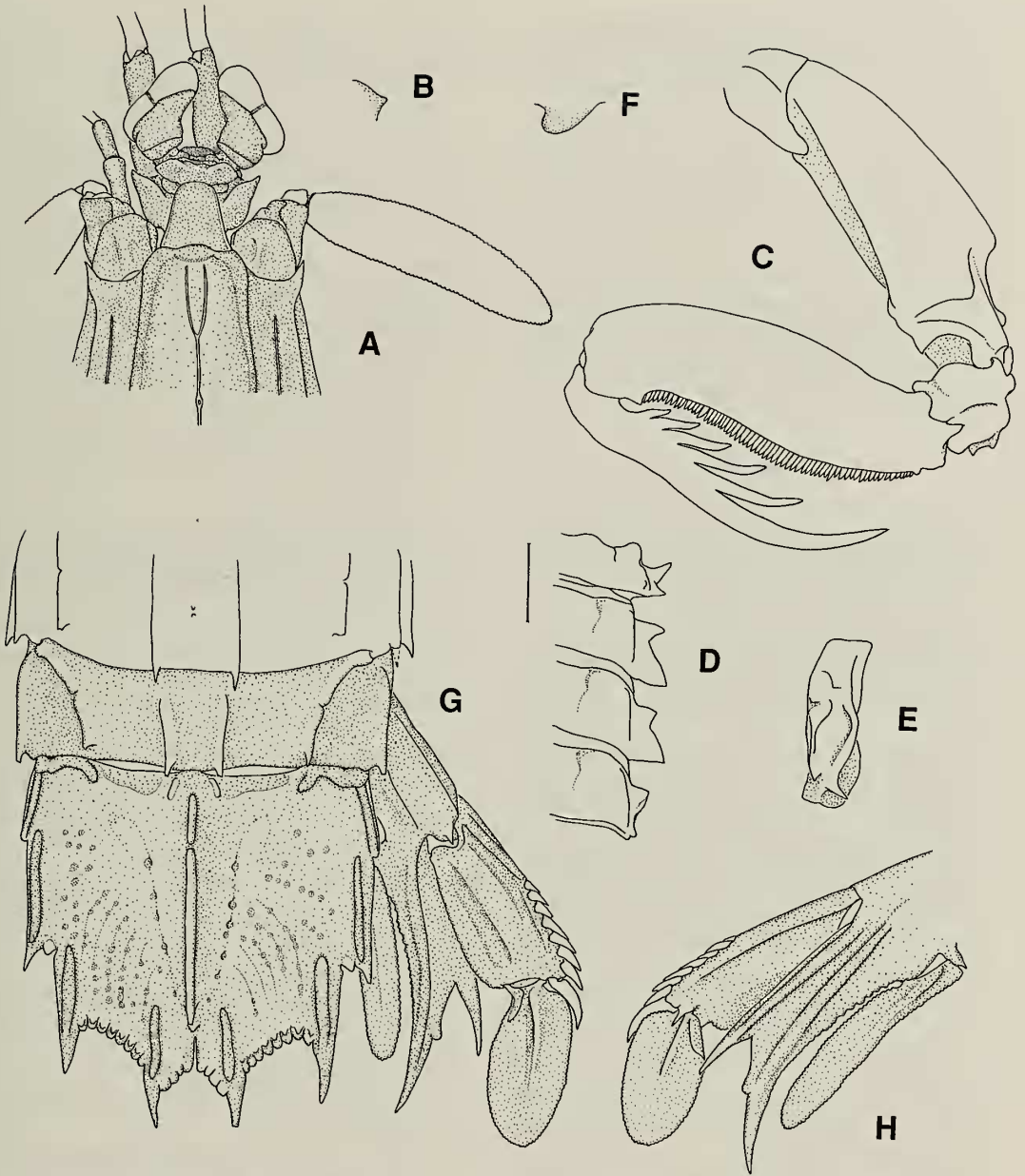


Fig. 1. *Oratosquilla fabricii* (Holthuis, 1941), holotype female (TL 128 mm), ZMA A, anterior cephalon, dorsal. B, A1 somite dorsal process, right lateral. C, raptorial claw, right lateral. D, TS5-8 lateral processes, right dorsal. E, TS5, right lateral. F, TS8 sternal keel, right lateral. G, AS5-6, telson and uropod, dorsal. H, uropod, right ventral. Scale equals 5 mm.

tate. Anterior lobe of lateral process of TS7 blunt ..... *O. mauritiana*  
 Dorsum integument distinctly punctate.  
 Anterior lobe of lateral process of TS7 pointed to blunt ..... *O. fabricii*

Acknowledgments

Thanks are due to the late Raymond B. Manning for providing working space and access to collections in the National Mu-

seum of Natural History, Smithsonian Institution, Cees Hof and Dirk Platvoet for providing access to the holotype of *Squilla fabricii* and for providing working space during a visit to Amsterdam in 1998. My stomatopod studies were supported by an Australian Museum Postgraduate grant, a grant from the Joyce Vickery Research Fund (Linnean Society of New South Wales), and an Australian Postgraduate Award from the Australian Research Council, administered by the University of New South Wales.

### Literature Cited

- Ahyong, S. T., & S. F. Norrington. 1997. Stomatopod Crustacea in the Macleay Museum, University of Sydney.—*Proceedings of the Linnean Society of New South Wales* 118:97–110.
- Bigelow, R. P. 1931. Stomatopoda of the southern and eastern Pacific Ocean and the Hawaiian Islands.—*Bulletin of the Museum of Comparative Zoology, Harvard University* 72(4):105–191, pls. 1, 2.
- Brooks, W. K. 1886. Report on the Stomatopoda collected by H. M. S. Challenger during the years 1873–76.—*The Voyage of the H. M. S. Challenger, Zoology* 16:1–116, pls. 1–16.
- Edmondson, C. H. 1921. Stomatopoda in the Bernice P. Bishop Museum.—*Occasional Papers of the Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History* VII(13):279–302, figs. 1, 2.
- Fukuda, T. 1911. Supplement to Japanese Stomatopoda.—*Dobutsugaku Zasshi* 23:173–175, pl. 1. [In Japanese].
- Garcia, R. G. 1981. Inventory of the littoral fauna of Tayabas Bay—Crustacea: Stomatopoda.—*National Museum Manila, Philippines, Zoological Papers* 6:1–33.
- Haan, W. de. 1833–1850. *Crustacea in Ph. F. von Siebold, Fauna Japonica sive descriptio animalium, quae in itinere per Japoniam, jussu et auspiciis superiorum, qui summum in India Batavia Imperium tenent, suscepto, annis 1823–1830 collegit, notis observationibus et adumbrationibus illustravit. Lugdunum Batavorum: A. Arnz.* 243 pp.
- Holthuis, L. B. 1941. The Stomatopoda of the Snellius Expedition.—*Biological Results of the Snellius Expedition XII. Temminckia* 6:241–294.
- Kemp, S. 1913. An account of the Crustacea Stomatopoda of the Indo-Pacific region, based on the collection in the Indian Museum.—*Memoirs of the Indian Museum* 4:1–217, figs. 1–10, pls. 1–10.
- Latreille, P. A. 1803. *Histoire naturelle, générale et particulière, des Crustacés et des Insectes* 3:467 pp., F. Dufart, Paris.
- . 1828. *Squille, Squilla*.—*Encyclopédie Méthodique. Entomologie ou Histoire naturelle des Crustacés, des Arachnides et des Insectes* 10:467–475. Agasse, Paris.
- Manning, R. B. 1968. A revision of the family Squillidae (Crustacea, Stomatopoda), with the description of eight new genera.—*Bulletin of Marine Science* 18:105–142.
- . 1971. Keys to the species of *Oratosquilla* (Crustacea: Stomatopoda), with descriptions of two new species.—*Smithsonian contributions to Zoology* 71:1–16.
- . 1978. Further observations on *Oratosquilla*, with accounts of two new genera and nine new species (Crustacea: Stomatopoda: Squillidae).—*Smithsonian Contributions to Zoology* 272:1–44.
- . 1995. Stomatopod Crustacea of Vietnam: the legacy of Raoul Serène.—*Crustacean Research, Special No. 4*:1–339. The Carcinological Society of Japan. Shimoda Printing, Kumamoto, Japan.
- Moosa, M. K. 1991. The Stomatopoda of New Caledonia and Chesterfield Islands. *In* Richer de Forges ed., *Le benthos des fonds meubles des lagons de Nouvelle-Calédonie* 1:149–219. Editions de l'ORSTOM, Paris.
- Poupin, J. 1998. Crustacea Decapoda and Stomatopoda of French Polynesia.—*Atoll Research Bulletin* 451:1–62.
- Schmitt, W. L. 1931 [for 1929] Chinese Stomatopoda collected by S. F. Light.—*Lingnan Science Journal* 8:127–155.
- Stephenson, W. 1962. Some interesting Stomatopoda—mostly from Western Australia.—*Journal of the Royal Society of Western Australia* 45(2):33–43.
- Townsley, S. J. 1953. Adult and larval stomatopod crustaceans occurring in Hawaiian waters.—*Pacific Science* 7(4):399–437.