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A new genus of ghost shrimp from Japan (Crustacea: Decapoda: Callianassidae)

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Abstract.—A new genus, *Nihonotrypaea*, is recognized for three species from Japan formerly assigned to *Callianassa* sensu lato: *N. japonica* (Ortmann, 1891), the type species; *N. harmandi* (Bouvier, 1901); and *N. petalura* (Stimpson, 1860).

One of us (A.T.) has carried out studies on the biology and development of the shallow water species, *Callianassa japonica* Ortmann, 1891, in an estuarine system on western Kyushu Island, Japan since 1989 (Tamaki et al. 1996, Tamaki et al. 1997). These studies revealed consistent differences in biology, development, habitat, and morphology in populations from different areas within the estuary, which extends from Ariake Sound through Tachibana Bay to the East China Sea (Tamaki et al. 1997: fig. 1). One of us (R.B.M.) examined samples from different localities within the study area and found that not only were there two species involved, but also that morphological characters warranted their separation into a new genus of Callianassinae. That two similar species occurred in Japan had been recognized by De Man (1928), who identified them as *C. japonica* and *C. harmandi* Bouvier, 1901, and clearly figured their diagnostic features; De Man's material all came from Bingo, Japan. De Man's findings generally have been ignored by subsequent students of the group. Sakai (1969) synonymized *C. harmandi* with *C. japonica* and recognized *C. petalura* Stimpson, 1860 as a distinct species.

As numerous studies on the biology of these species are in preparation by Tamaki and his colleagues and students, we decided to prepare this preliminary account to correct the specific names and make the generic name available. A more detailed account of the new genus and all three species assigned to it is in preparation by us.

Family Callianassidae Dana, 1854
Subfamily Callianassinae Dana, 1854
Nihonotrypaea, new genus

Diagnosis.—Carapace lacking rostral spine, minute median spinule present or absent. Cornea dorsal, subterminal, disc-shaped (Fig. 1*a*, *b*). Antennular and antennal peduncles similar. Third maxilliped (Fig. 1*c*, *d*) lacking exopod, ischium-merus suboperculiform, merus projecting beyond articulation with carpus; latter, propodus and dactylus slender. Chelipeds unequal, both with meral hook. First pleopod slender, uniramous in both sexes (Fig. 1*e*, *f*). Second pleopod absent in male, slender, biramous in female (Fig. 1*g*). Third to fifth pleopods with stubby, projecting appendices internae (Fig. 1*h*) in both sexes.

Type species.—*Callianassa japonica* Ortmann, 1891, by present designation.

Included species.—*Nihonotrypaea japonica* (Ortmann, 1891), new combination; *N. petalura* (Stimpson, 1860), new combination; and *N. harmandi* (Bouvier, 1901), new combination.

Etymology.—The generic name is formed by combining the Japanese name

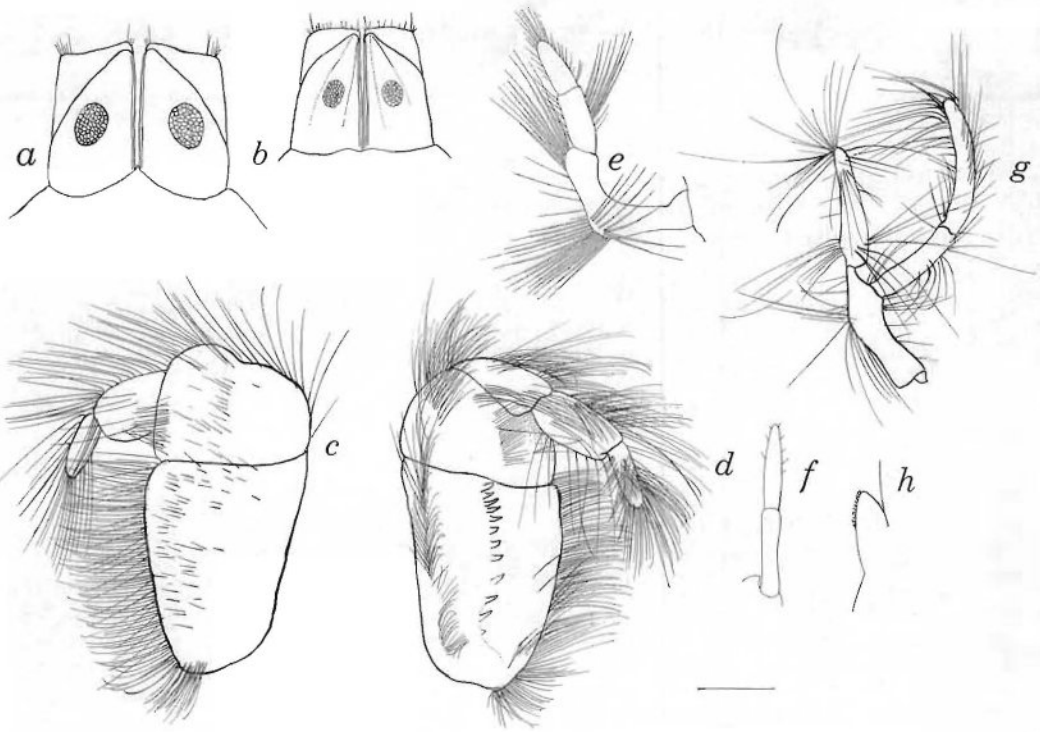

Fig. 1. *Nihonotrypaea harmandi* (Bouvier, 1901). *a*, Front and eyes; *c*, Third maxilliped, outer surface; *d*, Third maxilliped, inner surface; *e*, First pleopod of female; *f*, First pleopod of male; *g*, Second pleopod of female; *h*, Appendix interna of third pleopod of male (*a*, *e*, *f*, *h*, from De Man 1928: pl. 5, fig. 10, as *Callianassa* (*Trypaea*) *japonica*). *b*, *N. japonica* (Ortmann, 1891), from De Man 1928:pl. 3, fig. 6, as *Callianassa* (*Trypaea*) *harmandi*); *c*, *d*, *g*, female from Tomioka (National Museum of Natural History, Smithsonian Institution, Washington, D.C.). Scale = 1 mm, *c*, *d*; 0.5 mm, *g*.

for Japan, Nihon, with the generic name *Trypaea*. The gender is feminine.

Remarks.—With the addition of *Nihonotrypaea*, nine genera are now recognized in the callianassid subfamily Callianassinae. *Nihonotrypaea* can be distinguished from those with projecting appendices internae on pleopods 3–5 as follows: from *Biffarius* Manning & Felder, 1991 in that the size of adults is larger, the antennal and antennular peduncles are similar in size and shape, and the third maxilliped is much narrower; from *Calliapagurops* de Saint Laurent, 1973 by its subterminal corneas; from *Notiax* Manning & Felder, 1991 in lacking a strong median spine on the carapace and in having the merus of the third maxilliped projecting beyond its articulation with the carpus; from *Poti* Rodrigues & Manning, 1992, by the presence of a complete *linea thalassinica* on the carapace; from *Trypaea* Dana, 1852 in having a much smaller and shorter antennular peduncle.

In the three other genera in the subfamily (*Callianassa* Leach, 1814; *Gilvossius* Manning & Felder, 1992; and *Neotrypaea* Manning & Felder, 1991), the appendices internae of pleopods 3–5 are embedded in the margin of the endopod. That feature alone distinguishes members of these three genera from *Nihonotrypaea*, in which the appendices internae are projecting from the margin of the endopod.

One of the three species assigned to *Nihonotrypaea*, *N. petalura*, lives among boulders in the intertidal zone of ocean-

front beaches. The two other species, *N. japonica* and *N. harmandi*, live on protected flats in estuaries. The range of *N. petalura* is identical to that of *N. harmandi*.

Although De Man (1928) was correct in recognizing *C. japonica* and *C. harmandi* as distinct species, he assigned the wrong name to each of them, for he did not have access to their types and the original accounts were quite short. The two species can be distinguished by the size of their cornea alone, as shown by De Man (1928). In *N. harmandi* (Fig. 1*a*) the cornea is relatively large, at least half the width of the stalk, whereas in *N. japonica* (Fig. 1*b*) the cornea is much smaller, one-third to one-fifth the width of the stalk. In *N. harmandi*, the front often is ornamented with a minute spinule, which is lacking in *N. japonica*.

All members of the genus are relatively small, total lengths up to about 65 mm.

The two species also differ in aspects of biology, habitat, and their parasites (Manning & Tamaki, in preparation).

The original citations of the two species are:

Callianassa subterranea var. *japonica* Ortmann, 1891:56, pl. 1, fig. 10a [=*Callianassa* (*Trypaea*) *harmandi* sensu De Man, 1928:13, pl. 3, fig. 6].

Callianassa Harmandi Bouvier, 1901:333 [=*Callianassa* (*Trypaea*) *japonica* sensu De Man, 1928:13, pl. 5, fig. 10].

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Literature Cited

Bouvier, E.-L. 1901. Sur quelques Crustacés du Japon, offerts au Muséum par M. le Dr. Harmand.—Bulletin du Muséum d'Histoire Naturelle, Paris 7:332–334.

Dana, J. D. 1852. Macroura. Conspectus Crustaceorum &. Conspectus of the Crustacea of the Exploring Expedition under Capt. C. Wilkes, U.S.N.—Proceedings of the Academy of Natural Sciences of Philadelphia 6:10–28.

de Man, J. G. 1928. A contribution to the knowledge of twenty-two species and three varieties of the genus *Callianassa* Leach.—Capita Zoologica 2(6):1–56, pls. 1–12.

de Saint Laurent, M. 1973. Sur la systématique et la phylogénie des Thalassinidea: définition des familles de Callianassidae et des Upogebiidae et diagnose de cinq genres nouveaux (Crustacea Decapoda).—Comptes Rendus Hebdomadaires de Séances de l'Académie des Sciences, Paris (series D) 277:513–516.

Leach, W. E. 1814. Crustaceology. *In* D. Brewster, ed., Edinburgh Encyclopaedia 7(2):385–437, Edinburgh.

Manning, R. B., & D. L. Felder. 1991. Revision of the American Callianassidae (Crustacea: Decapoda: Thalassinidea).—Proceedings of the Biological Society of Washington 104(4):764–792.

———, & ———. 1992. *Gilvossius*, a new genus of callianassid shrimp from the eastern United States.—Bulletin of Marine Science 49(1–2)[for 1991]:558–561.

Ortmann, A. E. 1891. Die Abtheilungen der Reptantia Boas: Homaridea, Loricata und Thalassinidea. Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und den Liu-Kiu-Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen, III Theil.—Zoologische Jahrbücher, Abtheilung für Systematik, Geographie und Biologie der Tiere 6:1–58, pl. 1.

Rodrigues, S. de A., & R. B. Manning. 1992. *Poti*

gaucho, a new genus and species of ghost shrimp from southern Brazil (Crustacea: Decapoda: Callianassidae).—Bulletin of Marine Science 51(1):9–13.

Sakai, K. 1969. Revision of Japanese callianassids based on the variations of larger cheliped in *Callianassa petalura* Stimpson and *C. japonica* Ortmann (Decapoda: Anomura).—Publications of the Seto Marine Biological Laboratory 17(4): 209–252, pls. 9–15.

Stimpson, W. 1860. Crustacea Macrura. Prodromus descriptionis animalium evertebratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers ducibus, observavit et descripsit, Pars 8.—Proceedings of the Academy of Natural Sciences of Philadelphia 1860:22–47.

Tamaki, A., H. Tanoue, J. Itoh, & Y. Fukuda. 1996. Brooding and larval developmental periods of the callianassid ghost shrimp, *Callianassa japonica* (Decapoda: Thalassinidea).—Journal of the Marine Biological Association of the United Kingdom 76:675–689.

———, B. Ingole, K. Ikebe, K. Muramatsu, M. Taka, & M. Tanaka. 1997. Life history of the ghost shrimp, *Callianassa japonica* Ortmann (Decapoda, Thalassinidea), on an intertidal sandflat in western Kyushu, Japan.—Journal of Experimental Marine Biology and Ecology 210:223–250.