

Skelosophusa (Crustacea, Decapoda, Brachyura),
a New Genus of Potamonautid Freshwater Crab
from Madagascar, with Descriptions of
Two New Species

By

Peter K. L. NG

Department of Zoology, National University of Singapore,
Kent Ridge, Singapore 0511, Republic of Singapore

and

Masatsune TAKEDA

Department of Zoology, National Science Museum,
Shinjuku, Tokyo, 169 Japan

Abstract The Madagascan freshwater crab genus, *Madagapotamon* BOTT, 1965, of the family Potamonautidae, is redefined and restricted to only one species, *M. humberti* BOTT, 1965. A new genus, *Skelosophusa*, is established for *Madagapotamon gollhardi* BOTT, 1965, and two new species, *Skelosophusa eumeces* and *S. proluxa*, are described. The genus is characterized by the shape of the male abdomen, form of the anterolateral margin and shape of the carapace.

Several years ago, the second author received three specimens of freshwater crabs (family Potamonautidae) collected from caves in Madagascar, all of which had very long ambulatory legs. A joint study of these crabs revealed that these specimens belonged to two undescribed species. The study also required a reappraisal of the genus *Madagapotamon* BOTT, 1965, and a new genus, *Skelosophusa*, is established here as a result of these revisions. The present paper serves to characterize this new genus and describe the two new species. The affiliations of the new genus and species are also discussed.

The abbreviations G1 and G2 are used for the male first and second pleopods, respectively. Measurements, in millimetres, are of the carapace width and length, respectively. The specimens are deposited in the Muséum National d'Histoire Naturelle, Paris (MP), France, the Museo Regionale di Scienze Naturali, Torino (MRSN), Italy, and the National Science Museum, Tokyo (NSMT), Japan.

Family Potamonautidae

Subfamily Hydrothelphusinae

Genus *Skelosophusa* nov.

Type species. *Madagapotamon gollhardi* BOTT, 1965, by present designation.

Diagnosis. Carapace transverse, broader than long (Figs. 1 A, 3). Epigastric and postorbital cristae short, low but distinctly visible, gently rugose to sharp; epigastric cristae not joined postorbital cristae, separated by broad space; postorbital cristae stopping before beginning of cervical groove, not reaching epibranchial tooth (Figs. 1 A, 3). Anterolateral margin distinctly convex, cristate, serrated, external orbital angle broadly triangular, outer margin longer than inner; epibranchial tooth distinct but low, separated from external orbital angle by distinct notch; posterolateral margin gently concave, distinctly converging towards posterior margin of carapace (Figs. 1 A, 3). Third maxilliped ischium with deep median oblique sulcus, closer to inner margin; exopod reaching mid-length of merus, with long flagellum extending beyond width of merus (Fig. 6 A). Mandibular palp 2-segmented, terminal segment simple, not bilobed (Fig. 6 J, K). Ambulatory legs, especially meri, very long. Suture separating sternal segments 2 and 3 incomplete, not reaching edges of sternum. Male abdomen triangular, reaching imaginary line connecting posterior edges of bases of chelipeds; lateral margins of segments 2–7 straight or slightly concave (Fig. 6 M–O). G1 terminal and subterminal segments clearly demarcated (more apparent from dorsal view) (Figs. 1 C, E, 5 B, E, 6 C, E); terminal segment cone-shaped (Figs. 5 D–F, 6 D, E); groove for G2 ventral in position on subterminal segment; that on terminal segment ventral along proximal part, but marginal to submarginal along distal part (Figs. 1 D, F, 5 A, C, D, F, H, 6 B, D). G2 distinctly longer than G1,

Table 1. Differences between *Madagapotamon* BOTT, 1965, and *Skelosophusa* gen. nov.

<i>Madagapotamon</i>	<i>Skelosophusa</i>
Carapace subcircular in shape	Carapace distinctly transverse, oval in shape
Anterolateral margin strongly serrated, epibranchial tooth not visible	Anterolateral margin gently serrated, epibranchial tooth low but distinct
Male abdomen oval-shaped, lateral margins of segments 2–7 distinctly convex	Male abdomen distinctly triangular, lateral margins of segments 2–7 straight or gently convex
G1 terminal and subterminal segments not separated, demarcation between segments not visible	G1 terminal and subterminal segments clearly separated, demarcation between segments distinct
Groove for G2 on G1 terminal and subterminal segments clearly ventral in position	Groove for G2 on G1 subterminal segment ventral in position, that on terminal segment ventral on proximal part but marginal along distal part

with well developed distal segment, longer than half length of basal segment; tip of distal segment rounded (Fig. 1 G, 5 G, 6 F).

Etymology. The name is derived from the Greek "skelos" for leg, in arbitrary combination with a common ending for many freshwater crabs, alluding to the long legs possessed by members of the genus. Gender feminine.

Remarks. BOTT (1965) established the genus *Madagapotamon* for a new cavernicolous potamonautid crab from Madagascar, *M. humberti*, and included two other species, *M. ankaraharae* (NOBILI, 1906) and *M. gollhardi* BOTT, 1965, in it. This classification is, however, highly unsatisfactory. Beside their generally similar G1s, the three species are so different from one another in almost all the other features that they should probably be classified in three separate genera.

The present collection of crabs from Madagascar shows that the genus *Madagapotamon* should be restricted to the type species, *M. humberti*. *Madagapotamon gollhardi* BOTT, 1965, is referred to a new genus, here named *Skelosophusa* gen. nov. Two new species in the genus are also described, *S. proluxa* sp. nov. and *S. eumeces* sp. nov. The major differences between *Madagapotamon* and *Skelosophusa* are listed in Table 1. The generic position of *Potamon (Geothelphusa) ankaraharae* NOBILI, 1906, is uncertain. The ambulatory legs of *Skelosophusa gollhardi*, *S. proluxa* and *S. eumeces*, as well as their epigastric and postorbital cristae, are also differently structured compared to *Potamon ankaraharae* (cf. NOBILI, 1906 and BOTT, 1965). As we have no specimens of *Potamon ankaraharae* before us, a decision on its classification must be deferred until a later date. The genus *Madagapotamon*, as redefined at present, contains only one species, *M. humberti* BOTT, 1965.

A Note on Potamon pittarellii. In his treatment of the Madagascan freshwater crabs, BOTT (1965) did not discuss the status of *Potamon (Potamon) Pittarellii* NOBILI, 1905, a species described on the basis of a small 19.0 by 15.5 mm specimen from Moramanga. From the description and figure in NOBILI (1905: 2, fig.), *Potamon pittarellii* seems to resemble members of the genus *Skelosophusa*. BALSS (1929) had synonymized *Potamon pittarellii* under *Thelphusa madagascariensis* A. MILNE EDWARDS, 1872 (presently referred to the genus *Hydrothelphusa* by BOTT, 1965), but he subsequently (1934) recognized it as a distinct species. BALSS (1934: 520, pl. 1 fig. 1) had also recorded a male and a female specimen of *P. pittarellii* from Mananjiba, Ankara, in the Ambilobé district. COLOSI (1920: 25), however, noted that in *P. pittarellii*, "Il palpo mandibolare è bilobo." This would mean that *P. pittarellii* is actually a species of the Gecarcinidae, and probably a species of *Gecarcinautes* BOTT, 1960. BOTT (1965) recognized three taxa in the genus *Gecarcinautes*, *G. antongilensis antongilensis* (RATHBUN, 1905), *G. antongilensis vondrozi* BOTT, 1965, and *G. goudoti* (H. MILNE EDWARDS, 1853). *Potamon pittarellii* should now be recognized as a fourth *Gecarcinautes* taxon.

Skelosophusa gollhardi (BOTT, 1965), comb. nov.

(Fig. 1)

Madagapotamon gollhardi BOTT, 1965: 346, fig. 8, pl. 5 figs. 19–22.

Material examined. Holotype, male (23.2 by 16.1 mm) (MP), Ankara, Madagascar.

Diagnosis. Carapace cervical grooves very shallow; frontal regions smooth; anterolateral regions not granulated, almost smooth; posterolateral regions with very faint oblique and lateral striae (Fig. 1 A). Frontal margin gently sinuous, lined with very small, low rounded granules, appearing almost smooth; supraorbital margin lined

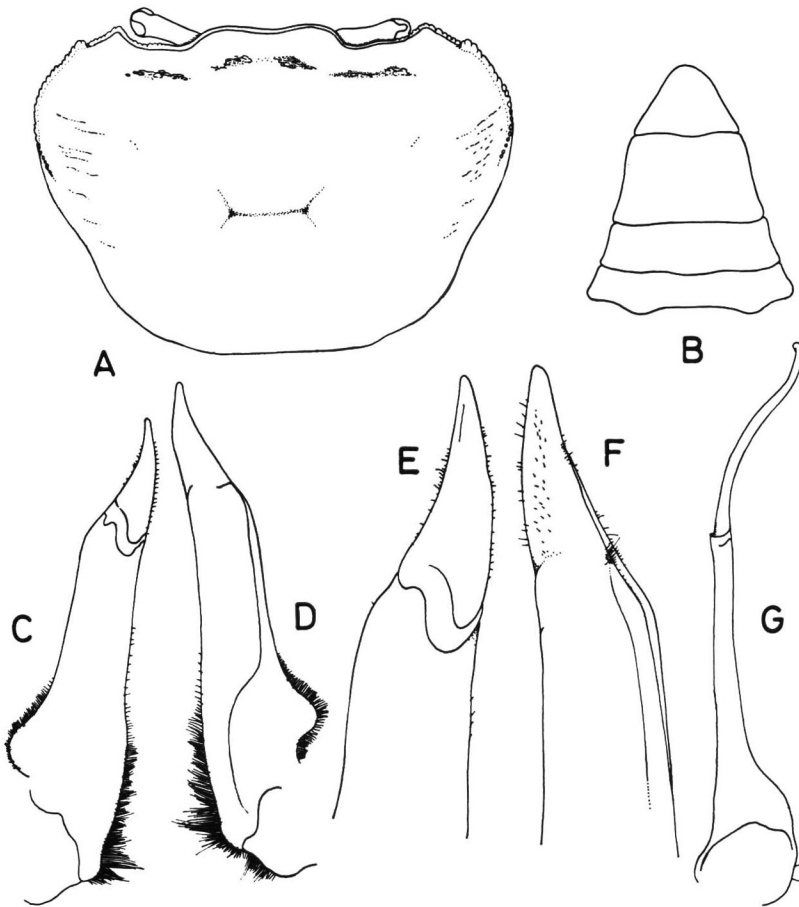


Fig. 1. *Skelosophusa gollhardi* (BOTT, 1965). Holotype male (23.2 by 16.1 mm) (MP). A, Dorsal view of carapace; B, last 4 segments of abdomen; C–F, right G1; G, right G2. C, E, Dorsal view; D, F, ventral view.

with very small, rounded granules along entire length; outer margin of external orbital angle about 3 times length of inner margin, lined with small rounded granules; epi-branchial tooth distinct, small, separated from external orbital angle by small notch; anterolateral margin appears serrated (Fig. 1 A). Epigastric cristae rugose, very low but distinct, separated by very shallow, indistinct Y-shaped groove; postorbital cristae rugose, low but distinct, outer edges just reaching below inner edge of external orbital angle (Fig. 1 A). Cornea of eye small (Fig. 1 A). Cheliped carpus with strong, sharp spine on inner distal margin, with several spines and sharp denticles on its proximal base; inner margins of merus with rows of sharp granules, no subdistal spine on outer margin. Ambulatory legs very long, second pair longest; merus of last leg 0.87 times carapace length; dorsal margins of meri gently serrated, each with dorsal subdistal knob, no spine. Suture separating male sternal segments 2 and 3 gently convex towards buccal cavity. Male telson shorter than abdominal segment 6; lateral margins of telson distinctly concave; lateral margins of segment 6 almost straight (Fig. 1 B). G1 terminal segment cone-shaped, curves gently upwards, 0.32 times length of subterminal segment (Fig. 1 C–F). G2 distal segment 0.63 times length of basal segment (Fig. 1 G).

Remarks. *Skelosophusa gollhardi* is known from only one specimen collected from a cave near Ankara, although the precise locality was not given. The main differences between *S. gollhardi*, *S. proluxa* and *S. eumeces* are listed in Table 2. The male holotypes of the three species are all comparable in size (23.2 by 16.1 mm, 25.6 by 18.1 mm, and 22.7 by 15.8 mm respectively) and the differences are unlikely to be associated with size and age. *Skelosophusa gollhardi* is closest to *S. proluxa* in carapace features, but differs very significantly in the form of their G1s and proportions of the last ambulatory leg, the merus of *S. gollhardi* being distinctly longer (0.87 vs. 0.73–0.74, relative to carapace length) (see Table 2).

Table 2. Main differences between *Skelosophusa gollhardi* BOTT, 1965, *S. proluxa* sp. nov. and *S. eumeces* sp. nov.

	<i>S. gollhardi</i>	<i>S. proluxa</i>	<i>S. eumeces</i>
Epigastric and postorbital cristae	distinct, but cristae weak, rugose	very weak, cristae very low, smooth	strong, cristae rugose, sharp
Cervical groove	very short, shallow	long but very shallow	broad and distinct
Ratio of last ambulatory merus to carapace length	0.87	0.73, 0.74	0.82
Ratio of last ambulatory merus to carapace width	0.60	0.73, 0.74	0.82
Ratio of G1 terminal to subterminal segments	0.32	0.38, 0.40	0.43

Skelosophusa prolixa sp. nov.

(Figs. 2, 3 A, 5, 6 H, I, K–N)

Material examined. Holotype, male (25.6 by 18.1 mm) (MRSN), Grotte Nord Ankara, Berges Sable, Madagascar. Paratype, male (16.7 by 12.5 mm) (NSMT), Grotte Ankara, Bengier, Rivere canon Forestier, Madagascar.

Diagnosis. Carapace cervical grooves broad, shallow (Fig. 2 A); frontal regions smooth, without trace of granules; anterolateral regions almost smooth, except for scattered very low rounded granules, especially near epibranchial tooth area; posterolateral regions smooth, without striae; pterygostomial region setose on proximal one-third (Fig. 3 A). Frontal margin sinuous; inner part of supraorbital margin gently lined with small, rounded granules; outer margin of external orbital angle uneven, about 3 times length of inner margin; epibranchial tooth low, blunt, separated from external orbital angle by small but distinct notch; anterolateral margin gently serrated (Fig. 3 A). Epigastric cristae very low, separated by distinct but shallow Y-shaped groove; postorbital cristae weak, outer edges not reaching below inner edge of external orbital angle (Figs. 2 B, 3 A). Cornea of eye small (Figs. 3 A, 6 L). Cheliped carpus with strong, sharp spine on inner distal margin, with several spines and sharp denticles on its proximal base (Fig. 6 H, I); inner margins of merus with rows of sharp granules, no subdistal spine on outer margin. Ambulatory legs very long, second pair longest; merus of last leg 0.73–0.74 times carapace length; dorsal margins of meri gently serrated, each with dorsal subdistal knob, but no spine. Suture separating male sternal segments 2 and 3 almost straight. Male telson shorter than abdominal segment 6; lateral margins of telson gently concave; lateral margins of segment 6 almost straight (Figs. 2 C, 6 M, N). G1 terminal segment cone-shaped, gently curves upwards, 0.38–0.40 times length of subterminal segment (Fig. 5 A–F, H, I). G2 distal segment 0.71 times length of basal segment (Fig. 5 G).

Etymology. The specific name is derived from the Greek “prolixus”, alluding to the long legs of the species.

Remarks. The two type males of *S. prolixa* sp. nov. agree very well in all the characters mentioned, although the smaller paratype male is distinctly smaller than the holotype male. The main differences between *S. prolixa* and *S. gollhardi*, the most closely related species, have been discussed earlier (see Table 2).

Skelosophusa eumeces sp. nov.

(Figs. 3 B, 4, 6 A–G, J, O)

Material examined. Holotype, male (22.7 by 15.8 mm) (MRSN), Andrafibae, Madagascar.

Diagnosis. Carapace cervical grooves very shallow; frontal regions with numerous small granules and rugae; anterolateral regions covered with numerous small flattened granules or striae, surface appearing very rugose; posterolateral regions with

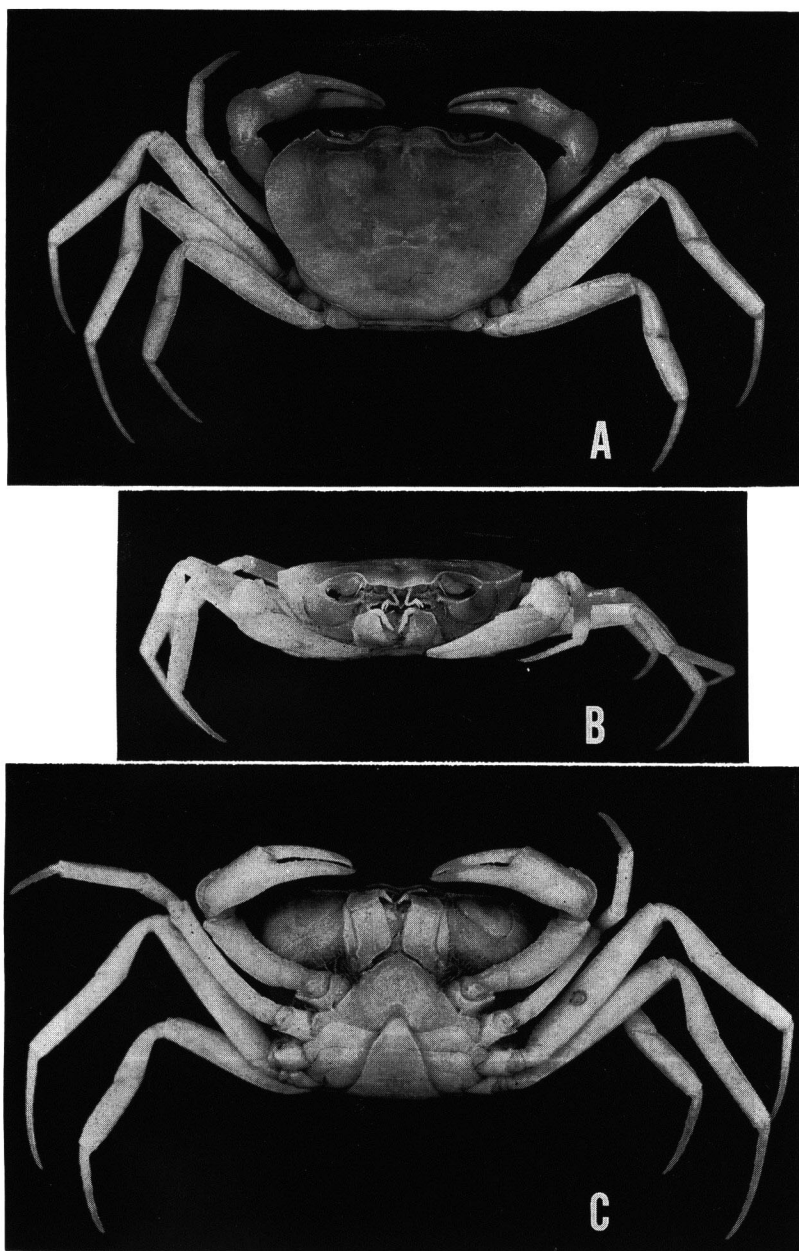


Fig. 2. *Skelosopusa prolixa* sp. nov. Holotype male (25.6 by 18.1 mm).

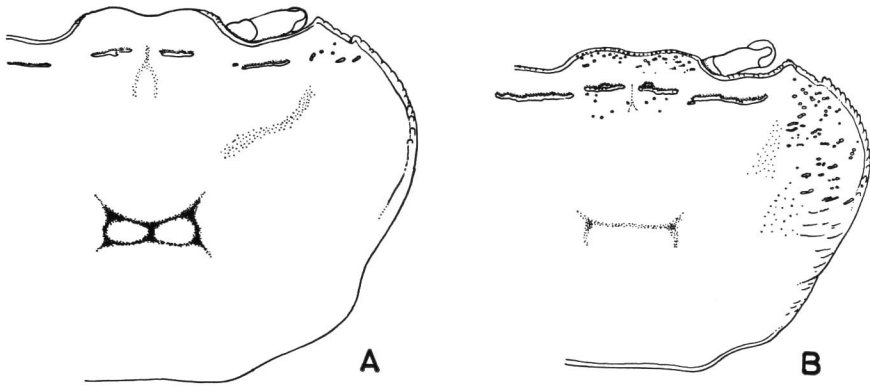


Fig. 3. Dorsal view of carapaces. A, *Skelosophusa prolixa* sp. nov., holotype male (25.6 by 18.1 mm); B, *Skelosophusa eumeces* sp. nov., holotype male (22.7 by 15.8 mm).

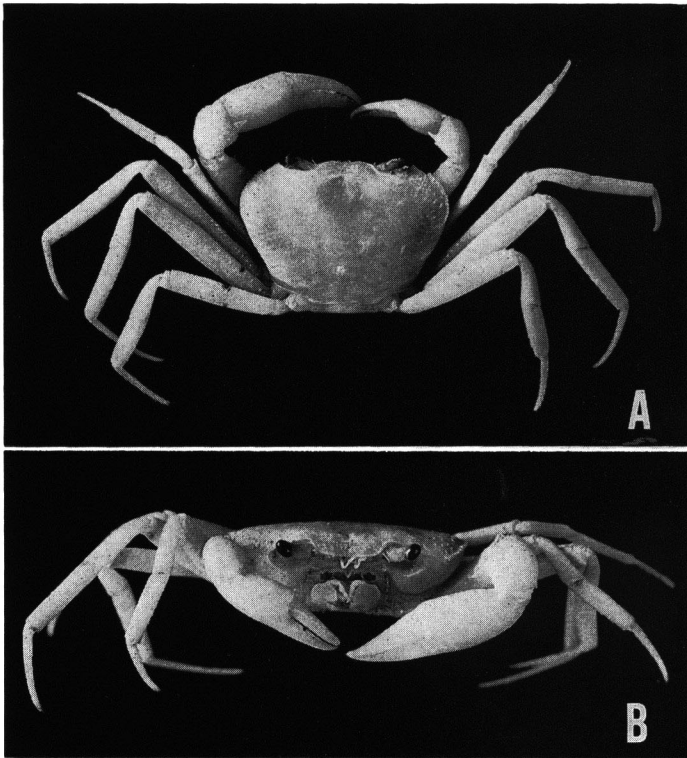


Fig. 4. *Skelosophusa eumeces* sp. nov. Holotype male (22.7 by 15.8 mm).

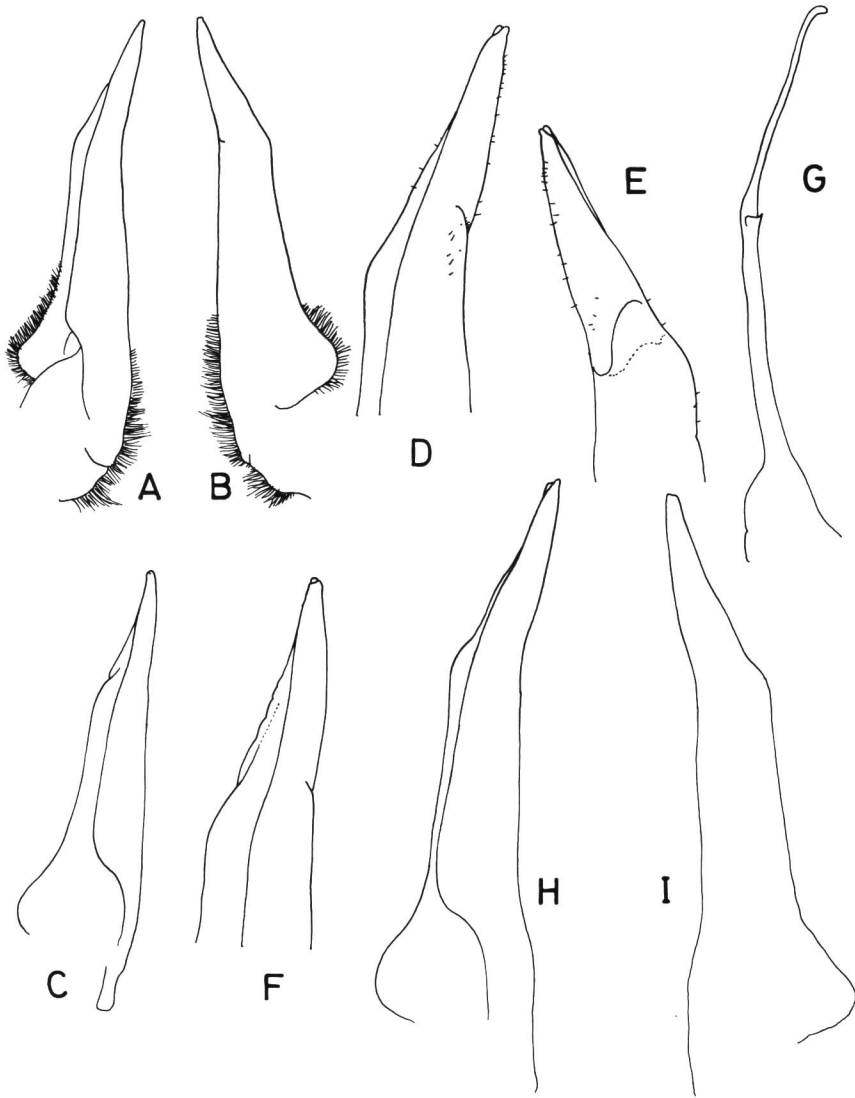


Fig. 5. *Skelosophusa prolixa* sp. nov. A-G, Holotype male (25.6 by 18.1 mm); H, I, paratype male (16.7 by 12.5 mm). A-F, H, I, Left G1s; G, left G2. C-F, Drawn from different orientations; A, C, D, F, H, ventral views; B, E, I, dorsal views.

distinct oblique and lateral striae (Fig. 4 A); pterygostomial region densely setose on entire surface (Fig. 3 B). Frontal margin sinuous, lined with small rounded granules; supraorbital margin lined with small, rounded granules along entire length; outer margin of external orbital angle uneven, about 3 times length of inner margin; epibranchial tooth distinct, small, separated from external orbital angle by distinct

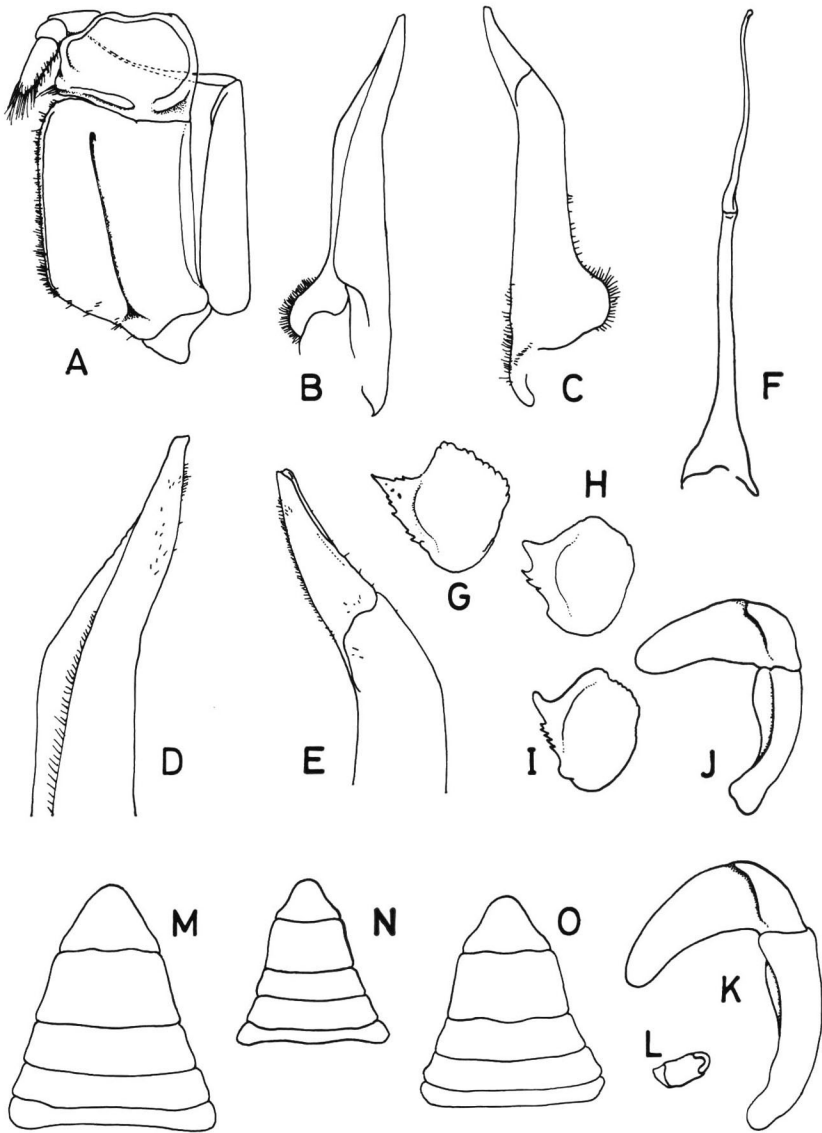


Fig. 6. A–G, J, O, *Skelosophusa eumeces* sp. nov., holotype male (22.7 by 15.8 mm). H, I, K–N, *Skelosophusa proluxa* sp. nov.; H, K, M, holotype male (25.6 by 18.1 mm); I, L, N, paratype male (16.7 by 12.5 mm). A, Left third maxilliped; B–E, left G1; F, left G2; G–I, left cheliped carpus; J, K, left mandibular palp; L, right eye; M–O, last 5 segments of abdomen.

notch; anterolateral margin serrated (Fig. 3 B). Epigastric cristae rugose, distinct, separated by very shallow, indistinct Y-shaped groove; postorbital cristae rugose, distinct, outer edges just reaching below inner edge of external orbital angle (Figs. 3 B, 4 B). Cornea of eye large, well developed (Fig. 3 B). Cheliped carpus with strong, sharp spine on inner distal margin, with several spines and sharp denticles on its proximal base; inner margins of merus with rows of sharp granules, no subdistal spine on outer margin (Fig. 6 G). Ambulatory legs very long, second pair longest; merus of last leg 0.82 times carapace length; dorsal margins of meri gently serrated, with dorsal subdistal knob, no spine. Suture separating male sternal segments 2 and 3 gently convex towards buccal cavity. Male telson shorter than abdominal segment 6; lateral margins of telson distinctly concave; lateral margins of segment 6 almost straight (Fig. 6 O). G1 terminal segment cone-shaped, curving upwards, 0.43 times length of sub-terminal segment (Fig. 6 B–E). G2 distal segment 0.71 times length of basal segment (Fig. 6 F).

Etymology. The name “eumeces” is derived from the Greek word for structures of a good length, alluding to the long ambulatory legs of the species. It is used as a noun in apposition.

Remarks. *Skelosophusa eumeces* has the most rugose carapace of the three known *Skelosophusa* species. The cornea of *S. eumeces* (Fig. 3 B) is also relatively more developed compared to those of *S. gollhardi* and *S. proluxa* (Figs. 1 A, 3 A), suggesting that it is not a cavernicolous species.

Acknowledgements

The authors are most grateful to Dr. Danièle GUINOT (MP) for kindly sending us the type of *S. gollhardi* for this study. Dr. Elena GAVETTI kindly offered us the specimens on which this study is based. The first author’s study in Japan was supported by the JSPS (Japanese Society for the Promotion of Science) Program with the National University of Singapore, and partially by a research grant (RP 900360) from the same university.

References

- BALSS, H., 1929. Über ostafrikanische Potamonidae (Decapoda). Mit Anhang: Potamoniden von Madagascar. *Zool. Jahrb., (Syst.)*, **58**: 339–358.
- 1934. Sur quelques Décapodes brachyours de Madagascar. *Faune des Colonies Françaises*, **5**: 501–528, pl. 1.
- BOTT, R., 1965. Die Süßwasserkrabben von Madagaskar (Crustacea, Decapoda). *Bull. Mus. natn. Hist. nat., Paris*, (2), **37** (2): 335–350, pls. 1–4.
- 1970. Die Süßwasserkrabben von Europa, Asien, Australien und ihre Stammesgeschichte. Eine Revision der Potamoidea und Parathelphusoidea (Crustacea, Decapoda). *Abh. Senckenb. nat. Ges., Frankfurt*, **526**: 1–338, pls. 1–58.
- COLOSI, G., 1920. I Potamonidi del R. Museo Zoologico di Torino. *Boll. Mus. Zool. Anat. comp.*

R. Univ. Torino, **35** (734): 1–39.

NOBILI, G., 1905. Descrizione di un nuovo Potamonide di Madagascar. *Boll. Mus. Zool. Anat. comp. R. Univ. Torino*, **20** (507): 1–4.