

Description of *Scabrotrophon pratasensis* spec. nov., a new Trophoninae (Gastropoda: Muricidae) from the South China Sea

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A new species of Muricidae assigned to the genus *Scabrotrophon* McLean, 1996 is described from the South China Sea. It is compared with nine species, six assigned to *Scabrotrophon*, two to *Nipponotrophon* Kuroda & Habe, 1971, a related genus and one to *Leptotrophon* Houart, 1995. All are extensively illustrated. *Scabrotrophon hawaiiensis* Houart & Moffitt, 2010 is assigned to the genus *Boreotrophon* P. Fischer, 1884.

Keywords: Gastropoda, Muricidae, *Scabrotrophon*, South China Sea, Pratas Islands.

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INTRODUCTION

The genus *Scabrotrophon* was established by McLean (1996) to distinguish it from *Boreotrophon* P. Fischer, 1884, *Trophonopsis* Bucquoy & Dautzenberg, 1882 and *Nipponotrophon* Kuroda & Habe, 1971, differing from these genera by the two dominant spiral cords of the early sculpture and by having a scabrous spiral sculpture of mature whorls. Apart from the type species (*Trophon maltzani* Kobelt, 1878), the genus then included four other northeastern Pacific species. Eight additional species were added to the genus by Houart & Lan (2001), seven from the Pacific Ocean and one, *Scabrotrophon fabricii* (Møller, 1842) from the northern Atlantic. Other species were subsequently described by Houart (2003), Houart & Sun (2004), Houart & Mof-

fitt (2010), Houart & Héros (2016), Houart et al. (2019) and Houart & Buge (2022); in addition, several previously known species from other genera were assigned to *Scabrotrophon*. An additional species is here described from Pratas Islands, southwest of Taiwan.

To date, 36 species are assigned to this genus (MolluscaBase eds., 2023) (Table 1). A species originally and currently included in *Scabrotrophon* in MolluscaBase (2023), *S. hawaiiensis* Houart & Moffitt, 2010 is here assigned to the genus *Boreotrophon* P. Fischer, 1884 (comb. nov.) for the same reason that *B. kamchatkanus* Dall, 1902 was assigned to this genus by Houart et al. (2019: 197), namely, for having the siphonal canal without spiral sculpture.

MATERIALS AND METHODS

The characters used to describe shell morphology address the general aspect of the shell including its shape, size, and colour, the shape of the spire including the number and features of the protoconch and teleoconch whorls, details of the suture and of the subsutural ramp, details of axial and spiral sculpture, the aperture and the siphonal canal. The shell was measured with a digital calliper to the nearest 0.5 mm. The method used to determine diameter and height, and to count the number of protoconch whorls follows Bouchet & Kantor (2004); the size of the protoconch was determined in using a 0.1 mm ocular micrometer.

The terminology used to describe the spiral cords follows Merle (2001, 2005) (Figs 1f-g). Abbreviations used are: P: primary cord; adis: adapical secondary spine on subsutural ramp; IP: infrasutural primary cord (primary cord on subsutural ramp); P1: shoulder cord; P2-P5: primary cords of the convex part of the teleoconch whorl; ABP: abapertural primary cord on the siphonal canal; MP: median primary cord on the siphonal canal; ADP: adapertural primary cord on the siphonal canal.

Abbreviations used for repositories are: CRH: Collection

Species	Distribution
<i>Scabrotrophon bondarevi</i> (Houart, 1995)	Kurile Islands, 110–340 m
<i>S. buldirensis</i> Houart, Vermeij & Wiedrick, 2019	Aleutian Islands, Alaska, 226–384 m
<i>S. callosus</i> (Nomura & Hatai, 1940)	Japan (no other data)
<i>S. cerritensis</i> (Arnold, 1903)	Santa Rosa Island to San Diego, California, 110–270 m
<i>S. chunfui</i> Houart & Lan, 2001	Taiwan and Japan, 200–250 m
<i>S. clarki</i> J. H. McLean, 1996	Monterey to Santa Rosa Island, California, 213 m
<i>S. densicostatus</i> (Golikov, 1985)	Okhotsk Sea, Alaska to northern California, around 70 m
<i>S. densilamellatus</i> (Golikov & Gulbin, 1977)	Okhotsk Sea, 5–180 m
<i>S. emphaticus</i> (Habe & Ki. Ito, 1965)	Kurile Islands, 33–600 m
<i>S. fabricii</i> (Møller, 1842)	Northern Atlantic, intertidal to 210 m
<i>S. fedosovi</i> Houart & Buge, 2022	South China Sea, 1151–1278 m
<i>S. grovesi</i> J. H. McLean, 1996	San Luis Obispo County to San Diego County, California, 70–590 m
<i>S. inspiratus</i> Houart, 2003	Vanuatu, Solomon Islands and Papua New Guinea, 307–1360 m
<i>S. kantori</i> Houart, Vermeij & Wiedrick, 2019	Santa Catalina Island, California, 46–55 m
<i>S. lani</i> Houart & C.-L. Sun, 2004	South China Sea, 250–350 m
<i>S. lasius</i> (Dall, 1919)	British Columbia to northern California, 90–550 m
<i>S. lima</i> Houart, Vermeij & Wiedrick, 2019	Aleutian Islands, Alaska, 168–226 m
<i>S. macleani</i> Houart, Vermeij & Wiedrick, 2019	Vancouver Island, British Columbia, intertidal
<i>S. maestratii</i> Houart & Héros, 2016	Papua New Guinea, 440 m
<i>S. maltzani</i> (Kobelt, 1878)	Aleutian Islands, Alaska to northern California, intertidal to 300 m
<i>S. manai</i> Houart & Héros, 2016	Papua New Guinea, 470–1000 m
<i>S. maranii</i> Houart & Héros, 2016	Papua New Guinea, 615–750 m
<i>S. moresbyensis</i> Houart, Vermeij & Wiedrick, 2019	Queen Charlotte Islands, British Columbia, 1170 m
<i>S. nodulosus</i> (Golikov, 1985)	Northern Japan, Sakhalin Island, 57–103 m
<i>S. norafosterae</i> Houart, Vermeij & Wiedrick, 2019	Aleutian Islands, Alaska, 166–263 m
<i>S. pratensis</i> spec. nov.	South China Sea, 700 m (dd)
<i>S. puillandrei</i> Houart & Héros, 2016	Papua New Guinea, 307–1019 m
<i>S. regina</i> (Houart, 1986)	Philippines, 682–970 m
<i>S. rossicus</i> (Egorov, 1993)	Kurile Islands, 180 m
<i>S. scarlatoi</i> (Golikov & Sirenko, 1992)	Okhotsk Sea, 17–600 m
<i>S. scitulus</i> (Dall, 1891)	Northern Japan, Okhotsk Sea, Alaska to northern California, 160–400 m
<i>S. stuarti</i> (E. A. Smith, 1880)	Bering Sea, intertidal to 100 m
<i>S. tegularis</i> (Golikov & Gulbin, 1977)	Okhotsk Sea, 5–129 m
<i>S. trifidus</i> Houart, Vermeij & Wiedrick, 2019	Aleutian Islands, Alaska, 160 m
<i>S. undocostatus</i> (Golikov & Sirenko, 1992)	Kurile Islands, 140–150 m
<i>S. yurii</i> (Egorov, 1994)	Okhotsk Sea, 50–160 m

Table 1. List of *Scabrotrophon* species and their distribution. The distribution data are based on the personal collection of the author, the original descriptions, information about the LACM collection by the late J. McLean, Kantor & Sysoev (2006) and Tsuchiya (2017).

of the first author; LACM: Los Angeles County Museum of Natural History, California, U.S.A.; MNHN: Muséum national d'Histoire naturelle, Paris, France; USNM: National Museum of Natural History, Washington, D.C., U.S.A.

SYSTEMATICS

Family Muricidae Rafinesque, 1815

Subfamily Trophoninae Cossmann, 1903

Genus *Scabrotrophon* J. H. McLean, 1996: 93

Type species (by original designation): *Trophon maltzani* Kobelt, 1878.

***Scabrotrophon pratensis* spec. nov.**

Figs 1a-g

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Type material. — Holotype MNHN-IM-2000-38799.

Type locality. — Pratas Islands, South China Sea, 700 m, obtained by Taiwanese trawler (Fig. 16).

Distribution. — Currently only known from the holotype.

Description. — Shell entirely greyish white. Shell medium sized for the genus, 39.4 mm in length. Length/width ratio 1.66, including spines. Slender, biconical, broadly ovate, strongly spinose, lightly built. Subsutural ramp broad, weakly sloping, weakly convex.

Spire high with 1.5 protoconch whorls and teleoconch of 5 broad, convex, strongly shouldered, spinose whorls. Suture of whorls impressed. Protoconch partly eroded, large, broad. Whorls rounded, width 1600 µm, height 2100 µm. Terminal lip eroded.

Axial sculpture of teleoconch whorls consisting of low, narrow, flattened varices, each varix with long dorsally recurved, broadly open, blunt, primary spines. Shoulder spine longest and broadest. Other axial sculpture of very low, shallow, growth lamellae. Axial sculpture of first whorl partly eroded, second with 14 varices, third with 16, fourth with 15, last whorl with 10 varices. Spiral sculpture of high, narrow, rounded, smooth primary cords. P₁ and P₂ cords visible from first to penultimate whorl, P₃ covered or partly covered by next teleoconch whorl. Spiral cords forming narrow, broadly open, abaxially recurved spine at crossing with axial sculpture, increasing in size from first to last whorl, with weakly longer shoulder spine. Last teleoconch whorl with low adis, obvious IP with small spinelets, P₁–P₅, s₅ on convex part of whorl, slowly decreasing in length from P₂ to P₅, and ADP, MP, ABP spinose cords on siphonal canal.

Aperture large, broadly ovate. Columellar lip narrow,

smooth, rim erect, weakly adherent at adapical extremity. Anal notch shallow, broad. Outer lip narrow, erect, wavy, smooth within. Siphonal canal long, narrow, partly broken on outer edge and at tip, broadly open, with ADP, MP and ABP cords and short spinelets.

Remarks. — *Scabrotrophon pratensis* spec. nov. has a fairly smooth shell compared to other *Scabrotrophon* species, but the general aspect, the obvious spiral sculpture, in particular the two, sometimes three, spiral cords that are clearly visible on the first teleoconch whorls (Fig. 1f), the broadly ventrally open spines and the large paucispiral protoconch suggesting intracapsular larval development are characters shared with other species assigned to this genus. It differs from a few related *Scabrotrophon* species and is here compared with *S. regina* (Houart, 1986), *S. chunfui* Houart & Lan, 2001, *S. inspiratus* Houart, 2003, *S. lani* Houart & Sun, 2004, *S. manai* Houart & Héros, 2016 and *S. puillandrei* Houart & Héros, 2016.

Scabrotrophon regina (Figs 2-3) from the Philippine Islands has a narrower, less shouldered shell with a narrower subsutural ramp, much shorter and broader spines, a more ovate aperture, and a shorter and broader siphonal canal.

Scabrotrophon chunfui from Taiwan (Figs 4a-d) has a more elongate, spineless or almost spineless shell with an ovate aperture and a different spiral sculpture with obvious secondary cords.

Scabrotrophon inspiratus (Figs 5-6) from Vanuatu, the Solomon Islands and Papua New Guinea and *S. manai* (Figs 7-8) from Papua New Guinea both differ in having 3 or 4 primary spiral cords instead of 5 in *S. pratensis* spec. nov., also in having flattened spines, a more triangular shaped last teleoconch whorl and previous spire whorls with more obvious and longer spines on the P₁ spiral cord.

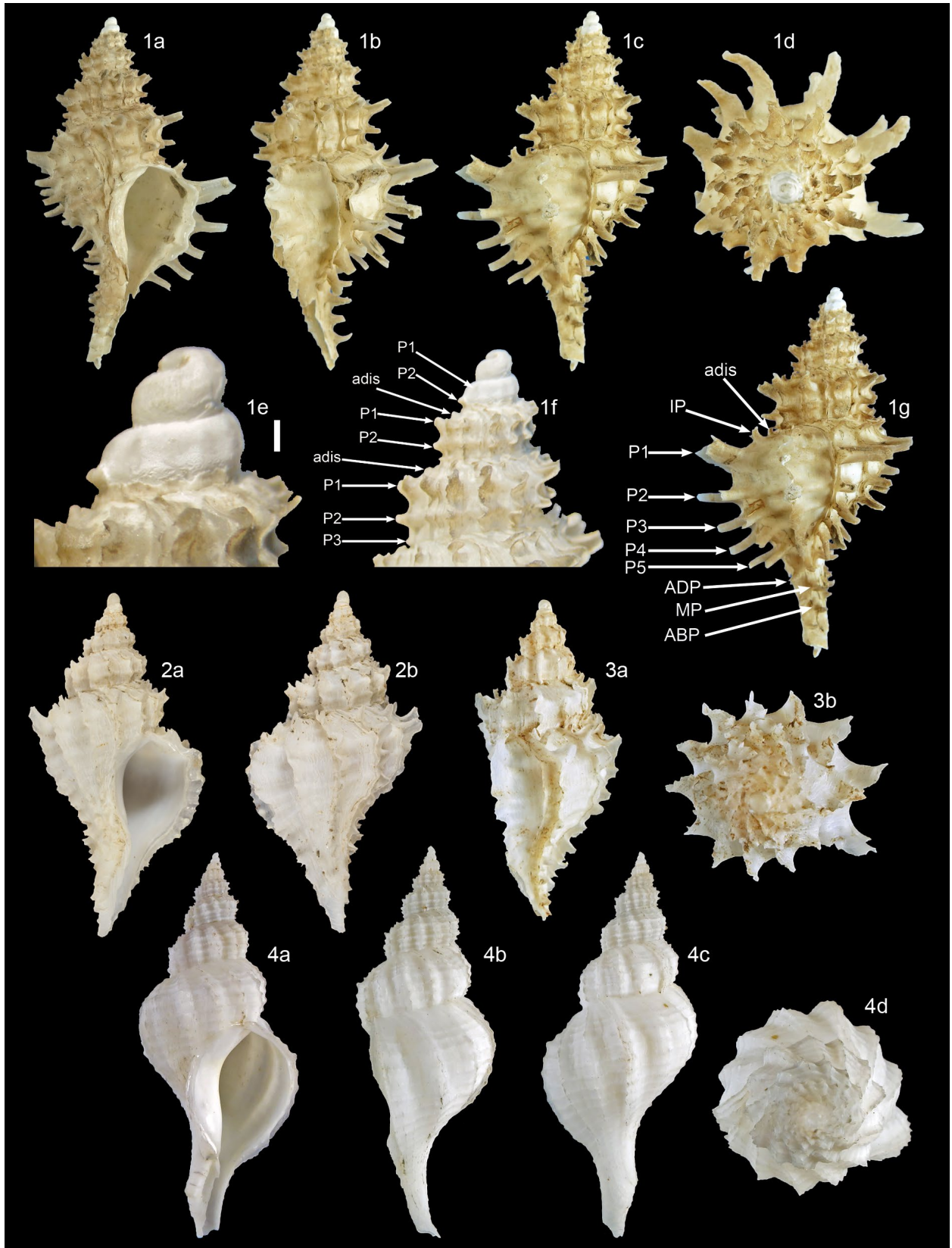
Scabrotrophon lani (Figs 9a-d) from the South China Sea and southern Japan also differs in having a thicker shell with obviously broader, fimbriate varices, shorter spines, and a broader, shorter siphonal canal. It also has secondary spiral cords, absent in *S. pratensis* spec. nov.

Scabrotrophon puillandrei (Figs 10-12) has a smaller, narrower shell with a higher spire, 15 or 16 spinose lamellae on the last teleoconch whorl and a shell with secondary and tertiary spiral cords while these are absent in *S. pratensis* spec. nov.

Two species of *Nipponotrophon* Kuroda & Habe, 1971, a related genus, may also be compared.

Nipponotrophon echinus (Dall, 1918) (Figs 13a-d) and *N. gorgon* (Dall, 1913) (Figs 14a-d) have fewer axial varices, 5 or 6 on last teleoconch whorl instead of 9 in *S. pratensis* spec. nov., in having less obvious spiral cords, a broader siphonal canal, shorter and broader, ventrally open spines at intersection of spiral cords with axial varices and a broader aperture.

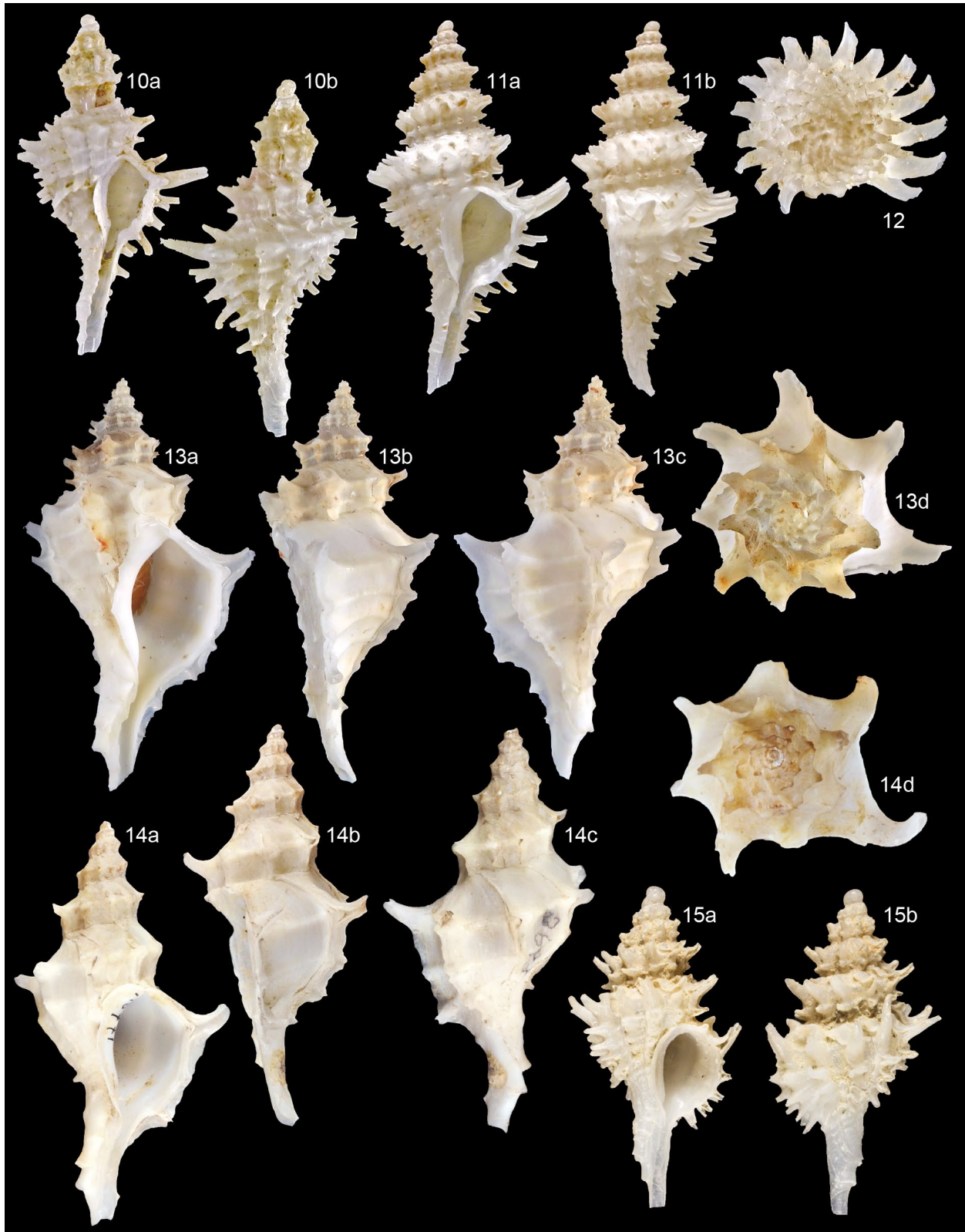
Finally, another spinose shell from Indonesia, in yet



Figs 1-3. *Scabrotrophon* species. **Figs 1a-g.** *Scabrotrophon pratensis* spec. nov., Pratas Islands, South China Sea, 700 m, holotype MNHN-IM-2000-38799, 39.4 mm. (1e), protoconch; (1f), spiral cords of the first teleoconch whorls; (1g), spiral sculpture of the last whorl. **Figs 2-3.** *Scabrotrophon regina* (Houart, 1986), between Luzon and Lubang, 13°44'N, 120°32'E, Philippines, 682–770 m. **2a-b**, holotype MNHN-IM-2000-929, 31.0 mm (photos M. Caballer, MNHN). **3a-b**, paratype CRH, 27.6 mm. **Figs 4a-d.** *Scabrotrophon chunfui* Houart & Lan, 2001, Northeast Taiwan, in 200–250 m, paratype CRH, 39.0 mm. Scale bar: 0.5 mm.



Figs 5-9. *Scabrotrophon* species. **Figs 5-6.** *Scabrotrophon inspiratus* Houart, 2003. **5a-b.** Vanuatu, 14°49'S, 167°15'E, 1360 m, holotype MNHN-IM-2000-3632, 39.0 mm (photos M. Caballer, MNHN). **6a-b.** South of Lae, Gulf of Huon, 06°54'S, 147°05'E, Papua New Guinea, 395–400 m, CRH, 34.4 mm. **Figs 7-8.** *Scabrotrophon manai* Houart & Héros, 2016. **7a-b.** Off Woodlark Islands, Papua New Guinea, 09°11'S, 152°16'E, 540–585 m, holotype MNHN-IM-2009-15290, 31.4 mm (photos M. Caballer, MNHN). **8a-b.** Eastern Kotako, 04°19'S, 145°37'E, Papua New Guinea, 1000–1045 m, CRH, 30.7 mm. **Figs 9a-d.** *Scabrotrophon lani* Houart & Sun, 2004, southern Japan, trawled, 250 m, CRH, 38.9 mm.



Figs 10-15. *Scabrotrophon*, *Nipponotrophon* and *Leptotrophon* species. **Figs 10-12.** *Scabrotrophon puillandrei* Houart & Héros, 2016. **10a-b.** East Kotakot, 04°19'S, 145°37'E, Papua New Guinea, 1000–1045 m, holotype MNHN-IM-2013-41021, 16.1 mm (photos M. Caballer, MNHN). **11a-b.** South of Lae, Gulf of Huon, Papua New Guinea, 700–740 m, paratype MNHN-IM-2000-31011, 16.4 mm (photos M. Caballer, MNHN). **12.** South of New Hanovre, 02°44'S, 150°00'E, Papua New Guinea, 1019–1390 m, paratype CRH, 15.8 mm. **13a-d.** *Nipponotrophon echinus* (Dall, 1918), off Jogashima, Sagami Bay, Japan, 250–300 m, CRH, 46.7 mm. **14a-d.** *Nipponotrophon gorgon* (Dall, 1913), Honshu Island, Sagami Bay, Japan, 280 m, holotype USNM 110771, 38 mm (photos Stephanie Boyle, USNM). **15a-b.** *Leptotrophon kastoroae* Houart, 1997, Kai Islands, 05°17'S, 132°41'E, 212–221 m, Indonesia, holotype MNHN-IM-2000-988, 11.2 mm.

another genus, *Leptotrophon kastoroae* Houart, 1997, has a much smaller and thicker shell, not exceeding 11 mm in length, with additional secondary cords, denticles within the aperture and a broader, straighter, spineless, siphonal canal (Figs 15a-b).

Etymology. — Named after the type locality, Pratas Islands.

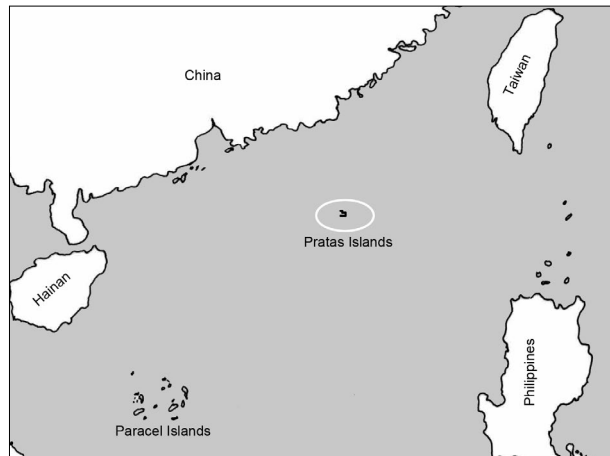


Fig. 16. Distribution of *Scabrotrophon pratensis* spec. nov.

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