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A New Species of *Lurifax* (Gastropoda: Heterobranchia: Orbitestellidae) from Sumisu Caldera, Southern Japan

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Abstract: A new species of the genus *Lurifax* is described from Sumisu Caldera, southern Japan. It is the second Recent species of the genus and the first record from the Northwest Pacific, following *L. vitreus* Warén & Bouchet, 2001 from the Mid-Atlantic Ridge and the Mediterranean. The two species are distinguished from each other by the form and sculpture of the teleoconch whorls.

Keywords: new species, *Lurifax*, Orbitestellidae, chemosynthesis-based biological community

Introduction

In the course of systematic studies on vent/seep-associated molluscs from Japanese waters, an unidentified species of discoidal gastropod was found among samples collected from Sumisu Caldera, southern Japan (see Sasaki *et al.*, 2003: fig. 1 for its location). It has a trochid- or vitrinellid-like shell, but close observations on the teleoconch, protoconch and radula revealed that it is a new species of the genus *Lurifax*, which was recently described from the Mid-Atlantic Ridge (Warén & Bouchet, 2001). The taxonomic description of the new species is given as follows.

Description

Subclass Heterobranchia Gray, 1840
Family Orbitestellidae Iredale, 1917

Genus *Lurifax* Warén & Bouchet, 2001

Remarks: See Warén & Bouchet (2001: 207) for diagnosis and discussion on its higher systematic position.

***Lurifax japonicus* n. sp.**
(Fig. 1A-C)

Material: Holotype (Fig. 1A-C): Sumisu Caldera, 31°27.97′N, 140°4.44′E, 676 m, *Shinkai 2000* Dive 1017, May 26, 1998, 1.5 (width) × 0.8 (height) mm, deposited at Department of Historical Geology and Paleontology, The University Museum, The University of Tokyo. UMUT-RM 28655 Paratype (Fig. 1D): Same locality. Shell originally broken and unmeasurable. Radula extracted. UMUT-RM 28656.

Diagnosis: Whorls discoidal, markedly depressed with rather low spire, flattened smooth subsutural ramp, sharply carinate spiral keels above periphery.

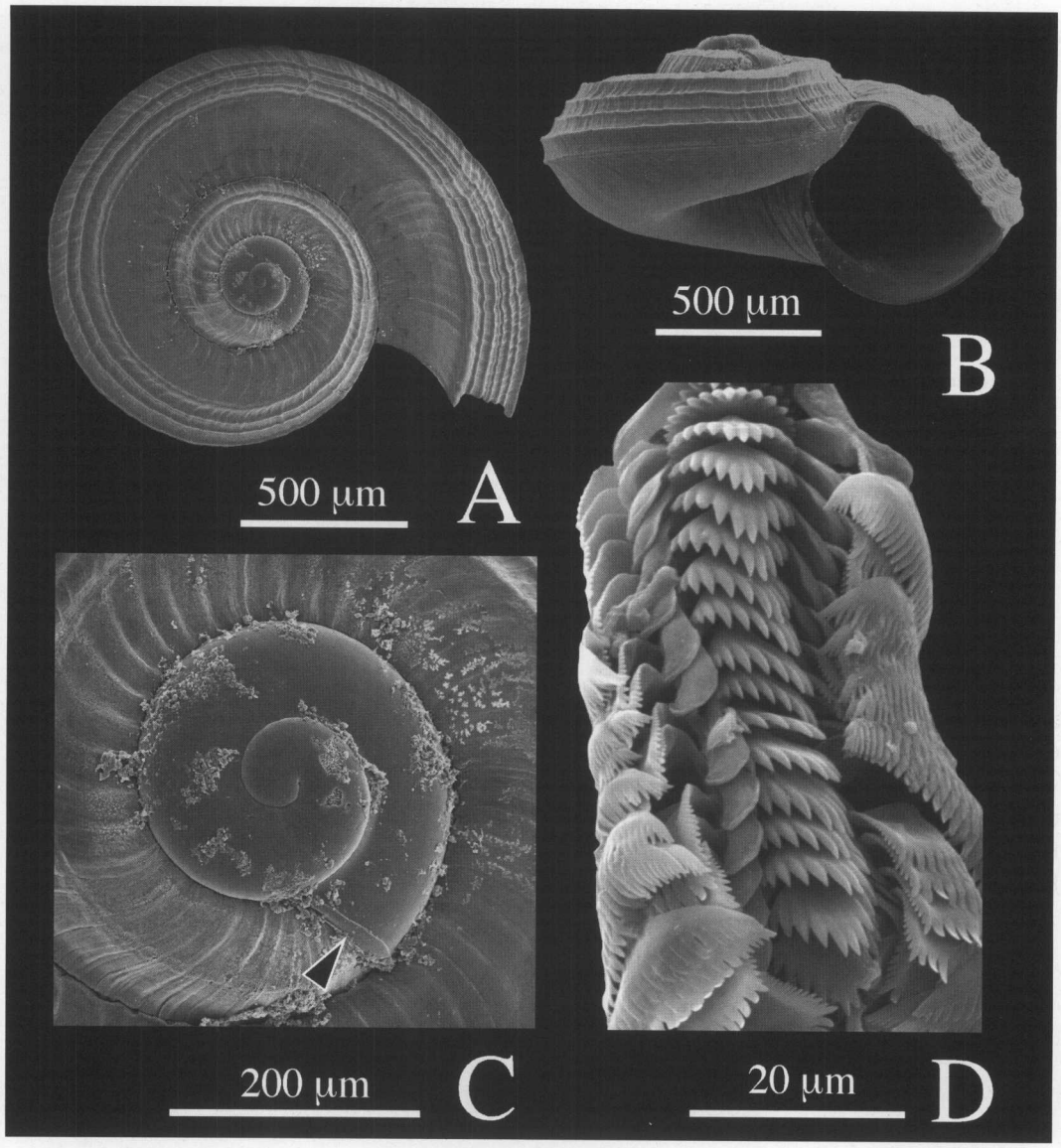

Fig. 1. *Lurifax japonicus* n. sp. **A-C.** Shell, holotype UMUT-RM 28655. A. Apical view, B. Frontal view. C. Enlarged view of protoconch. Arrowhead indicates boundary between protoconch and teleoconch. **D.** Radula, paratype UMUT-RM 28656.

Description: Shell depressed, discoidal, consisting of *ca.* 1+1/8 whorls of protoconch and 2 teleoconch whorls. Protoconch entirely smooth; division between protoconch I and II not discernible; final part of protoconch aperture thickened, forming distinct varix, prosocline relative to coiling axis, not parallel to growth lines of teleoconch. Whorls of teleoconch sharply carinate with 2 strong keels on shoulder and periphery, respectively. Interspace of keels initially devoid of spiral sculpture; first spiral rib appearing at 1/2 whorl; one more spiral rib intercalated at 3/4 whorls; finally 3 more spiral ribs added at final 1/4 whorl. Subsutural ramp mostly smooth, ornamented with delicate collabral sinusoidal lines along suture. Umbilicus wide, deeply

perforated. Aperture subrhomboic; peristome not thickened nor reflected. Parietal wall narrow; most of inner lip disjunct from body whorl; basal lip rounded. Aperture of holotype partly broken, but growth lines showing sinusoidally curved outline.

Radula formula 1-1-1-1-1. Central tooth transversely wide, rather thickened compared to other teeth, consisting of triangular cusp (Fig. 1D) in center and posterolaterally extended bases; cusp sharply crenulated with 13 denticles. Lateral teeth thin; cusp more elongated longitudinally than that of central tooth; cutting edge finely serrated with denticles gradually increasing in size outwards; bases not observed. Marginal teeth thin, wing-like, more transversely larger than lateral teeth; cutting edge serrated with deep slit between denticles; bases not observed.

Etymology: The species name "*japonicus*" is given for its occurrence in Japan. The gender of *Lurifax* is masculine (Warén & Bouchet, 2001: 207).

Distribution: Known only from the type locality. Topographical and geophysical features of the habitat were reported by Iwabuchi (1999). The locality is the marginal part of a submarine caldera formed in the Pleistocene. Water temperature near the sampling site was about 12 degrees. A colony of *Bathymodiolus* sp. was observed in the same dive (Iwabuchi, 1999: photo 8).

Discussion

The morphology of shell and radula suggests the species described above belongs to the genus *Lurifax* established by Warén & Bouchet (2001) based on *L. vitreus* from Menez Gwen to Lucky Strike in the Mid Atlantic Ridge at depths of *ca.* 850-1800 m. The type species and *L. japonicus* n. sp. share apparent similarities in shell and radular morphology: discoidal whorls with a slightly elevated spire, spiral keels and ribs of variable thickness, and delicate radial sculpture in the subsutural ramp, a smooth rounded base, and a deeply open umbilicus. The protoconch (Fig. 1C; Warén & Bouchet, 2003: figs. 37c-d) is also similar, with the same number of orthostrophic whorls, a small pit in the coiling center, a smooth surface without division between protoconch I and II, and a final aperture that is thickened and oblique to teleoconch growth lines. Common features in the radula are the number of teeth, the serrated rhomboic cusp and anterolaterally extended bases of the central tooth, and the finely serrated ovate-triangular wing-like lateral and marginal teeth. The combination of these characters is possessed only by these two species among known gastropods, and thus well characterizes the genus.

The separation of *L. japonicus* n. sp. from the type species is supported by morphological differences in the form and sculpture of the teleoconch whorls. (1) The whorls of *L. japonicus* n. sp. (Fig. 1B) are more depressed than those of *L. vitreus* (Warén & Bouchet, 2003: fig. 44e-g). The subsutural ramp is particularly flattened, and the peripheral keel is situated at a more adapical level. (2) The sculpture of the whorls is also different, when compared at equivalent growth stages. At the end of the second teleoconch whorl, the subsutural ramp is more densely ornamented with sinuous spiral lines and there is a larger number of spiral ribs between the shoulder and peripheral keels in *L. vitreus* than in *L. japonicus* n. sp.

Warén & Bouchet (2001: 207) noted that a subrecent species described as *Pterolabella* sp. by Lewis & Marshall (1996) probably belongs to *Lurifax*. Their close relation is supported by the discoidal shell with a smooth protoconch, the thickened aperture of the protoconch, sinusoidal spiral lines along the suture, several spiral ribs between shoulder and peripheral keels, the weakly swollen, smooth base and the deep umbilicus. Differences between the new species and the unidentified species from New Zealand are the more highly elevated spire, more densely sculptured subsutural ramp and larger number of spiral ribs between shoulder and peripheral keels in the latter species. Thus, the genus *Lurifax* currently includes two Recent species from the Mid-Atlantic Ridge, Mediterranean, and Northwest Pacific, and possibly a single subrecent species from New Zealand.

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スミスカルデラから発見されたシンカイウズマキガイ属（新称）（腹足綱：異鰓亜綱：ミジンハグルマガイ科）の1新種

佐々木猛智・奥谷喬司

要　約

海洋研究開発機構（旧：海洋科学技術センター）の潜水調査船「しんかい2000」により伊豆諸島沖のスミスカルデラから未知の平巻の腹足類が採集された。本種は，貝殻の外形からはニシキウズガイ科，あるいはイソマイマイ科の一種であるかのように見える。しかし，原殻と歯舌の形態を観察した結果，Warén & Bouchet (2001) によって異旋類のミジンハグルマガイ科の新属として記載された *Lurifax* 属の新種 *L. japonicus* ニッポンシンカイウズマキガイ（和名新称）であることが判明した。本新種は大西洋中央海嶺産の模式種 *L. vitreus* Warén and Bouchet, 2001 に次いで *Lurifax* 属に確実に同定される種であり，本属の北西大平洋新記録である。