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NEW GENUS AND SPECIES OF FORAMINIFERA FROM THE PLIOCENE FORMATION, SOUTHWESTERN HOKKAIDO

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Introduction and Acknowledgments

The present writer is engaged in a study of stratigraphy and of palaeontology, Pliocene in age, especially as concerned with the fossil foraminifera.

Many new forms have been found among these fossil foraminiferas at hand.

In the present note, there are described and illustrated a new genus and eight new species of foraminifera from the Pliocene Setana group (Setana formation and Nakanokawa formation (MS)*).

Before going into description, the writer wishes to express his hearty thanks to Prof. M. MINATO, Hokkaido Univ., who has guided him in the course of his study, also to Prof. K. ASANO, Tohoku Univ., who has given him valuable advice and has read the present note in manuscript.

Systematic Description

Family Nodosariidae

Genus *Saracenaria* DEFRANCE, 1824

Saracenaria minatoi SHIRAI n. sp.

Pl. I, figs. 1, 2.

Description—Test much elongate, curved, length 3 or more times greater than width of the broadest portion, triangular in transverse section, earlier chambers closely coiled, later ones uncoiling and not reaching to initial end, periphery acute with a keel; chambers distinct, rather uniform shape, inflated; sutures distinct, depressed, very slightly limbate, nearly straight; wall calcareous, thin, smooth, finely perforate; aperture terminal, radiate with a distinct slit. Holotype length 0.52 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No.

* The present writer plans before long to report as to these formations.

13558. Kaigara-sawa, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Nakanokawa formation, Pliocene.

Occurrence—The present species occurs rarely from the Nakanokawa formation but not from the Setana formation.

Remarks—The present species is close to *Saracenaria schencki* CUSHMAN et HOBSON but distinguished from it in having slender and curved test.

Family Nonionidae

Genus *Nonion* MONFORT, 1808

Nonion shiribeshiense SHIRAI n. sp.

Pl. I, figs. 3a-b.

Description—Test entirely involute, slightly compressed, periphery broadly rounded, umbilical region depressed, very slightly granulated; chambers distinct, inflated, of rather uniform shape, 6-7 in last whorl; sutures distinct, depressed, very slightly limbate, gently curved; wall calcareous, rather thin, smooth, finely perforate; aperture a small, low opening at base of apertural face. Holotype diameter 0.35 mm, thickness 0.21 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No. 13559. Kaigara-sawa, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Nakanokawa formation, Pliocene.

Occurrence—The present species is found rarely in the Nakanokawa formation but not in the Setana formation.

Remarks—The present species differs from *Nonion pompilioides* (FICHTEL et. MOLL) in having depressed and less limbate sutures, thinner wall and fewer chambers in last whorl. This species is different from *Nonion pacificum* (CUSHMAN) in respect to its more convex test and small number of chambers. The less compressed test and umbilicus without large stellate area of this species differentiates it from *Nonion akitaense* ASANO.

Family Elphidiidae

Genus *Elphidium* MONFORT, 1808

Elphidium nakanokawaense SHIRAI n. sp.

Pl. I, figs. 4a-b; 5a-b.

Description—Test rather small for the genus, slightly compressed, broadly oval in outline, periphery broadly rounded, margin lobulate; granular shell material filled on very slightly depressed umbilical area

and extended to peripheral margin along depressed sutures; chambers distinct, inflated, of uniform shape and increasing gradually in size as added, 7-8 in last whorl; sutures distinct, curved, retral processes few, usually obscure; wall calcareous, rather thin, smooth, finely perforate; aperture a narrow slit with small rounded pores at base of apertural face. Holotype diameter 0.26 mm, thickness 0.14 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No. 13560. Nakano-sawa, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Nakano-kawa formation, Pliocene.

Occurrence—The present species occurs commonly from the Nakano-kawa formation but not from the Setana formation.

Remarks—The present species is similar to *Elphidium etigoense* HUSEZIMA et MARUHASHI but distinguished from it in having subglobular test. This species is different from *Elphidium subgranulosum* ASANO by small number of chambers and from *Elphidium hughesi foraminosum* CUSHMAN by less number of chambers and stronger curved sutures.

Family Rotaliidae

Genus *Discotruncana* SHIRAI n. gen.

Genotype *Discotruncana japonica* SHIRAI n. sp.

Description—Test rotaliform, much compressed, all chambers visible on dorsal side, only those of last whorl on ventral side, periphery sharply truncate, sides flattened; wall calcareous, finely perforate; aperture a rounded opening at ventral border of base of apertural face, supplementary foramina at near umbilical region.

Remarks—The present genus may probably be related to *Planulinoides*. Sharply truncate periphery, apertural position and apertural shape of this genus distinguish it from *Planulinoides*, *Discorbis* and allied genera.

Discotruncana japonica SHIRAI n. sp.

Pl. I, figs. 6a-c.

Description—Test trochoid, broadly oval in outline, much compressed, nearly plate-like but dorsal side slightly convex, ventral side slightly depressed, periphery sharply truncate with a double peripheral keel, sides flat; chambers distinct, about 7 in last whorl, increasing gradually in size as added; sutures distinct, limbate, curved on both sides, strongly raised on dorsal side, flush on ventral side; wall calcareous, finely perforate, on

ventral side with tubercles near umbilicus; aperture a rounded opening with a distinct lip at ventral border of base of apertural face, supplementary foramina has excavated irregularly bifid indentation near umbilical region but usually almost filled with secondary shell material. Holotype diameter 0.49 mm, thickness 0.16 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No. 13561. Soibetsu-gawa, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Nakanokawa formation, Pliocene.

Occurrence—The present species is known rarely from the Nakanokawa formation and very rarely from the Pleistocene Nopporo formation in the Ishikari Depression.

Genus *Eponides* MONFORT, 1808

Eponides asanoi SHIRAI n. sp.

Pl. II, figs. 1a-c.

Description—Test subcircular in outline, biconvex, periphery sub-acute to acute with a thick keel; chambers 8-9 in last whorl, increasing gradually in size as added; sutures much limbate, flush, oblique on dorsal side, usually obscure, radiate on ventral side; wall calcareous, finely perforate, on dorsal side marked by beads of clear shell material; aperture a narrow slit on ventral margin of last chamber. Holotype diameter 0.61 mm, thickness 0.33 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No. 13562. Akadamobuchi, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Setana formation, Pliocene.

Occurrence—A few specimen of the present species are found in the Setana formation in Kuromatsunai, Kunnui, Hanaishi and Imagane districts but not in the Nakanokawa formation.

Remarks—The present species is variable in rate of convexity of the test, peripheral angle and distribution of beads of shell material on ventral side.

This species is close to *Eponides tanai* UCHIO but distinguished from it by test which shows beads of clear shell material scattered almost all over the ventral side.

Genus *Buccella* ANDERSEN, 1952

Buccella kuromatsunaiensis SHIRAI n. sp.

Pl. II, figs. 2a-c.

Description—Test rather small for the genus, subcircular in outline,

biconvex, dorsal side more convex than ventral side, periphery acute with a keel, umbilical region not depressed; chambers 6–7 in last whorl; sutures limbate, flush or very slightly raised and strongly oblique on dorsal side, often obscure, flush to very slightly depressed and usually filled with clear shell material nearly half way to periphery on ventral side; wall calcareous, finely perforate; aperture a narrow slit at ventral border of last chamber. Holotype diameter 0.47 mm, thickness 0.24 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No. 13563. Kaigara-sawa, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Nakanokawa formation, Pliocene.

Occurrence—The present species is found abundantly in the Nakanokawa formation and commonly in the Setana formation.

Remarks—The present species is similar to *Buccella frigida* (CUSHMAN) and *B. inusitata* ANDERSEN but distinguished from them in having non-translucent wall, obscure surface and filling of clear shell material on ventral sutures. The absence of pustulose shell material near umbilicus, less depressed sutures on ventral side and small number of chambers of this species distinguish it from *Buccella anderseni* MCLEAN, *B. depressa* ANDERSEN, *B. parkerae* ANDERSEN and *B. hannai* (PHLEGER et. PARKER).

Family Cassidulinidae

Genus *Epistominella* HUSEZIMA et. MARUHASHI, 1944

Epistominella suttsuensis SHIRAI n. sp.

Pl. II, figs. 3a-c.

Description—Test very small, trochoid, equally biconvex or dorsal side slightly more convex than ventral side, periphery subrounded, margin slightly lobulated, umbilical region depressed, entirely closed; chambers distinct, 7–8 in last whorl, inflated; sutures distinct, depressed, limbate, oblique on dorsal side, nearly radial, slightly limbate on ventral side; wall calcareous, translucent, finely perforate; aperture an elongate slit, nearly parallel to coiling plane. Holotype diameter 0.2 mm, thickness 0.1 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No. 13564. Kaigara-sawa, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Nakanokawa formation, Pliocene.

Occurrence—The present species is found abundantly in the Nakanokawa formation and rarely in the Setana formation.

Remarks—The present species is similar to *Epistominella naraensis* (KUWANO) but distinguished from it by more compressed test and more number of chambers. This species is different from *Epistominella pul-*

chella HUSEZIMA et MARUHASHI and *E. japonica* (ASANO) in having smaller size, more chambers and not a peripheral keel. The dorsal convexity is stronger than that of ventral side of this species distinguish it from *Epistominella takayanagii* IWASA.

Epistominella hokkaidoensis SHIRAI n. sp.

Pl. II, figs. 4a-c.

Description—Test medium size for the genus, broadly oval in outline, trochoid form, biconvex, dorsal side slightly more convex than ventral side, periphery bluntly acute, umbilical region slightly depressed, entirely closed; chambers distinct, 6-7 in last whorl, slightly inflated, final chamber occupies 1/3 or more of the area of ventral side; sutures distinct, much limbate, strongly oblique on dorsal side, limbate, nearly radial, flush on ventral side; wall calcareous, finely perforate, dorsal surface marked by a double row of small rounded pores along sutures which are usually spinose because of amorphous shell material; aperture large, elongate on ventral border of peripheral margin, nearly parallel to periphery. Holotype diameter 0.52 mm, thickness 0.24 mm.

Holotype—Inst. Geol. Miner., Fac. Sci., Hokkaido Univ., Reg. No. 13565. Soibetsu-gawa, Kuromatsunai Machi, Suttsu Gun, Hokkaido. Nakanokawa formation, Pliocene.

Occurrence—The present species occurs rarely from the Nakanokawa formation but not from the Setana formation.

Remarks—The present species typically has a double row of small pores along the dorsal sutures. This character of this species is different from any of other species of *Epistominella*.

Literature

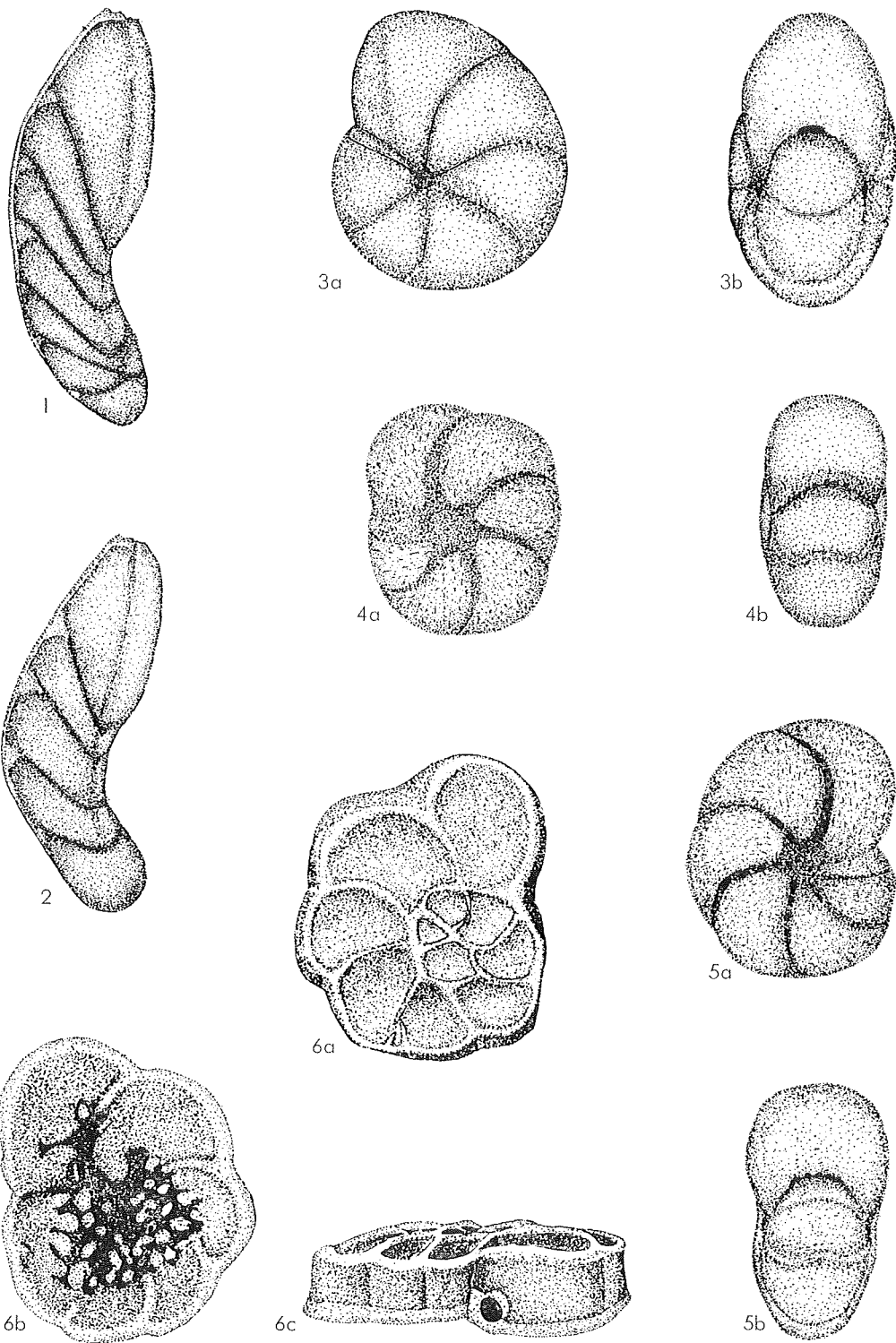
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Explanation of
Plate I

Explanation of plate I

- Fig. 1. *Saracenaria minatoi* SHIRAI n. sp. (Holotype) ($\times 120$)
Fig. 2. *S.* *minatoi* SHIRAI n. sp. ($\times 120$)
Figs. 3a-b. *Nonion shiribeshiense* SHIRAI n. sp. (Holotype) ($\times 120$)
Figs. 4a-b. *Elphidium nakanokawaense* SHIRAI n. sp. ($\times 146$)
Figs. 5a-b. *E.* *nakanokawaense* SHIRAI n. sp. (Holotype) ($\times 146$)
Figs. 6a-c. *Discotruncana japonica* SHIRAI n. sp. (Holotype) ($\times 94$)



Explanation of
Plate II

Explanation of plate II

- Figs. 1a-c. *Eponides asanoi* SHIRAI n. sp. (Holotype) ($\times 75$)
Figs. 2a-c. *Buccella kuromatsunaiensis* SHIRAI n. sp. (Holotype) ($\times 100$)
Figs. 3a-c. *Epistominella suttsuensis* SHIRAI n. sp. (Holotype) ($\times 155$)
Figs. 4a-c. *E. hokkaidoensis* SHIRAI n. sp. (Holotype) ($\times 88$)

