HOKKAIDO UNIVERSITY

| | |
|---|---|
| Title | A New Species of Nerinea from Central Hokkaido |
| Author(s) | Fukada, Atsuo |
| Citation | Journal of the Faculty of Science, Hokkaido University. Series 4, Geology and mineralogy, 8(3), 211-216 |
| Issue Date | 1953-03 |
| Doc URL | https://hdl.handle.net/2115/35866 |
| Type | departmental bulletin paper |
| File Information | 8(3)_211-216.pdf |

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

# A NEW SPECIES OF NERINEA FROM CENTRAL HOKKAIDO

By

Atsuo FUKADA

(With 1 Figure and 2 Plates)

Contribution from the Department of Geology and Mineralogy, Faculty of Science, Hokkaido University, Sapporo; No. 480

Between the lower course of the Sorachi-gawa in the north and Kanayama in the south, there is developed a thick complex of the Lower Ammonite beds (Aptian to Gault) in the lower part of which is intercalated a thin lens of limestone (*Orbitolina* limestone), containing *Orbitolina discoidea-conoidea* var. *ezoensis* YABE and HANZAWA, *Praecaprotina yaegashii* (YEHARA), *Toucasia carinata* (MATHERON) var. *orientalis* NAGAO, some calcareous algae including *Pterophyton miyakoense* YABE and *Nipponophycus ramosus* YABE and TOYAMA and some reef-building corals.

In addition to this fauna a thick shelled forms of *Nerinea* are also yielded from the *Orbitolina* limestone, but they have remained undescribed, until now, owing mainly to the bad state of preservation of the fossils.

The geological age of this limestone was, first, determined by H. YABE and H. HANZAWA as Aptian and afterwards, through the discovery of the pachyodont bivalves T. NAGAO found a strong support as to the Aptian age of the fauna.

In the autumn of 1950, when the writer was carrying on a stratigraphical survey along the upper course of the Sôshubetsu-gawa, Shimekapp-mura, Hidaka Province, he found numerous specimens of *Nerinea* accompanied by *Orbitolina* and some pachyodont bivalves from the cliff of the *Orbitolina*-limestone exposed a new path along the valley in the neighbourhood of Takimibashi (Nibantaki).

This paper is the description of a new *Nerinea* occurred from Central Hokkaido.

The writer wishes to express his sincere thanks to Prof. I. HAYASAKA for his kind aid and criticism.

According the writer's observation, the succession of strata is, in descending order, as follows (Fig. 1);

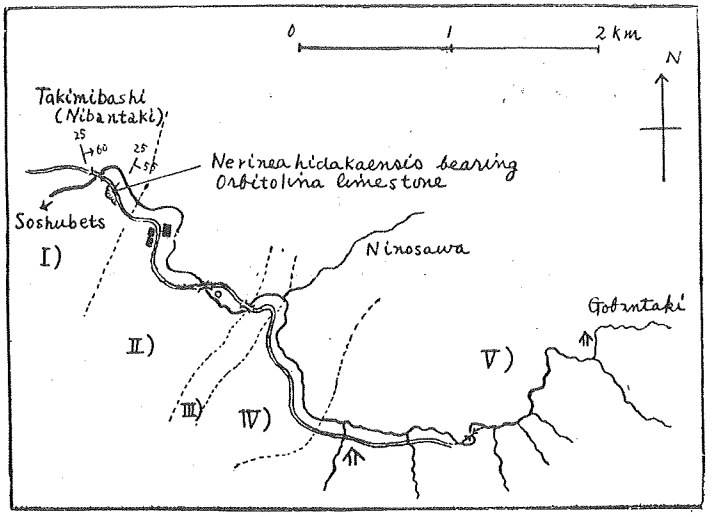



Fig. 1. Geological Rout-map of the Upper course of Soshubetsu-gawa, Hidaka.

I) ····· Thin alternation of fine grained sandstone and silicious shale belonging to the typical Lower Ammonite beds which intercalates two lenses of fossiliferous limestone (*Orbitolina* limestone), very rarely containing subangular pebbles of silicious rock. Each limestone lens is 5–6m thick, and about 7m apart from each other.

II ····· Light bluish-gray, coarse-grained, massive sandstone, occasionally conglomeratic, and sometimes cherty in appearance.

III ····· Intermediate part predominantly silicious, cherty sandstone.

IV ····· More or less greenish schalstein or fine sandstone, occasionally intercalating cherty beds.

V ····· Schalstein and its agglomerate, occasionally intercalating saccharoidal, non-fossiliferous limestone lenses (the so-called "Schalstein formation proper.")

These strata, exposed along the Sôshubetsu-gawa, trend, as a whole, NNE (N25°–30°E), and dip about 55°–70° toward SE, forming an overturned monoclinal structure as shown in Fig. 1. Consequently, the formations exposed are older toward upstream.

None of the specimens collected, more than fifteen in number, are

perfect, either umbo or aperture being very difficult to observe if not impossible. Nevertheless, by means of polishing the limestone containing these Nerineas, the internal structure of the shell has been comparatively well observed in profiles.

### *Nerinea hidakaensis* n. sp. (Pl. 12 and 13)

*Dimensions*:

One of cotypes (preserving presumably from 12th to 18th whorls)
Height: 165 mm
Diameter: 65 mm in the anterior end, about 50 mm in the posterior

Another specimen of cotypes (4 whorls are preserved)
Height: 97 mm
Diameter: 65 mm in the anterior end

*Description*:

Shell thick and test gigantic (roughly estimated to be more than 400 mm in height in one specimen, and about 80 mm in diameter near the body whorl in another incomplete specimen.), high-turreted, composed of numerous whorls (presumably about 15 whorls to 25 whorls). Several early whorls (up to about nineth whorl) comparatively rapidly taper towards the apex, which is frequently worn out, subsequent whorls increasing more slowly in diameter; consequently the apical angle in the subsequent whorls is less than 20 degrees; the last whorl a little larger than the penultimate one.

Whorls being a little broader than, or almost as braod as, high, without changing the ratio from the anterior to the posterior; consecutive whorls are separated by a weak groove-like suture; surface of the shell is apparently flat and smooth except for the slight convexity in the suprasutural portion of the whorl; in consequence the lateral side of the whorl is slightly concave in the middle of the depth.

The thick exterior part of the shell being eroded away the interior surface facing the lateral wall is shown, where two spiral, broad ridges in each whorl are recognized; the upper ridge is broad and subangular, and the lower narrow and elevated, the interspaces being rather deep.

Compared with the distinct uneveness of interior surface, the exterior surface is almost even and smooth.

Aperture is imperfectly preserved, but presumably rhombic or

subquadrangular with the thin outer lip as is suggested in cross-section. Interior of the shell penetrated by a strong and thick columella which is twisted, hollow, and provided with plications. Of the two columellar plications, the anterior one lying a little below the middle of the columella is stronger than the parietal fold which is situated at the posterior corner of the whorl.

*Remarks*:

The genus *Nerinea* reached their acme in the Jurassic and the early Cretaceous, rapidly declined in the late Cretaceous, and disappeared before the close of the Cretaceous time.

Up to the present, the classification of the genus *Nerinea* has been tried by many palaeontologists such as M. COSSMAN, H. G. BRONN, A. PERON, W. O. DIETRICH, W. WENZ, *etc.*

Although remains of *Nerinea* have been frequently found from the Jurassic and Cretaceous formations in Japan, the identified species are very rare, including only the following three species beside some other indetermined ones.

1) *Nerinea naumanni* SUGIYAMA and ASAO
2) *Nerinea naumanni neumayri* SUGIYAMA and ASAO
3) *Nerinea rigida* NAGAO

A well known *Nerinea* cf. *visurgis* ROEMER which was first described by NAUMANN and NEUMAYR from the Torinosu limestone in Shikoku, South-western Japan, was subsequently decided by SUGIYAMA and ASAO to include the following two forms, *Nerinea naumanni* and *Nerinea naumanni neumayri*.

These Upper Jurassic species are easily distinguished from *Nerinea hidakaensis* in having much broader whorls, distinct spiral ridges, tubercles on the suprasutural swelling, and the different shape of columellar folds.

*Nerinea rigida* NAGAO occurred in a certain horizon (*Nerinea* zone) from the Hiraiga sandstone of Miyako series (Aptian) seems to have some characters in common with *Nerinea hidakaensis*. But the modes of fossilization of these two species are quite different, that is, the former is found in sandstone, and the latter in limestone.

However, having no material of the former at hand, it is beyond my power to make comparison between them. But our species is widely apart from *Nerinea archimedi* and *N. vogotiana* which were considered by NAGAO as akin to his *Nerinea rigida*.

On the other hand, *Nerinea gigantea* D'HOMBRE-FIRMAS from the Upper Barremian of France which sometimes reaches to 600 mm in height, and 100 mm in diameter, is closely similar to ours; but the surface of the shell of the former is more uneven than in the latter. Moreover, our specimens lack the strong suture band with nodose swellings of *Nerinea gigantea*. Regarding the details of the cross-section, especially the nature of strong columella, it is not easy to find any difference between them because of such a state of preservation of specimen.

*Nerinea epelys* WOODRING which was recently described by W. P. WOODRING from the south western Oriente Province, Cuba, can be readily distinguished from *Nerinea hidakaensis* in its higher whorls, uneven nodose rows with corresponding axials along the sutural bands, and two columellar folds facing to the strong spindel.

From what has been stated above, it seems that the *Nerinea* from Hokkaido is a new species with the considerably gigantic shell and strong, thick and hollow columella. To this I propose the specific name *hidakaensis*.

It is remarkable, however, that Nerineas from the sandstone facies such as those of Hiraiga sandstone of Miyako series, Lower Cretaceous Oshima formation of Rikuzen, and Middle Jurassic Tsukinoura formation of Ozika Peninsula, are, as a rule, comparatively small in their growth size in comparison to the present extraodinarily gigantic species in the limestone facies.

As far as the writer has learned from various sources, it seems possible that Nerineas in limestone, in general, grow larger than those in sandy and shaly facies of sediments. Much more material is necessary to draw any definite conclusion to this problem, however.

## References

BRONN, H. G. (1836). Übersicht und Abbildungen der bis jetzt bekannten Nerinea-Arten: Neues Jahrbuch f. Min. u. s. w. pp. 545–566, pl. 6.

COSSMANN, M. (1898). Contribution a la Paléontologie Française des terrains jurassiques: Gastropodes Nérinées: Mem. Soc. Géol. Fr., Pal., Mém. Tome VIII, fas. I et II.

DIETRICH, W. C. (1925). Gastropoda Mesozoica, Family Nerineidae: Fossilium Catalogus, I: Animalia: pars 31, pp. 1–164.

LEVASSEUR, M. (1935). Contribution a l'étude des Nerineidae du Rauracien de Lorraine: Bull. Soc. Géol. Fr., (5), IV.

NAGAO, T. (1932). A New Variety of *Toucasia carinata* (MATHERON) from the Lower Cretaceous of Japan, Jour. Fac. Sci. Hok. Univ., Ser. IV, Vol. III, No. 2.

NAGAO, T. (1932). Occurrence of *Toucasia* in the Lower Cretaceous of Japan, Proc. Imp. Acad., VIII, No. 10.

NAGAO, T. (1934). Cretaceous Mollusca from the Miyako District, Honshu, Japan, Jour. Fac. Sci. Hok. Univ., Ser. IV, Vol. II, No. 3.

SUGIYAMA, T. & ASAO, S. (1942), On *Nerinea* cf. *visurgis* ROEMER from the Torinosu-limestone, Japan, (in Japanese), Jour. of Geol. Japan, Vol. 49. No. 590, pp. 438–443.

WOODRING, W. P. (1952). A *Nerinea* from Southwestern Oriente Province, Cuba: Jour. of Paleontology, Vol. 2, No. 1. pp. 60–62.

# Explanation of Plate

# 1 2

# Plate 12

*Nerinea hidakaensis* n. sp.

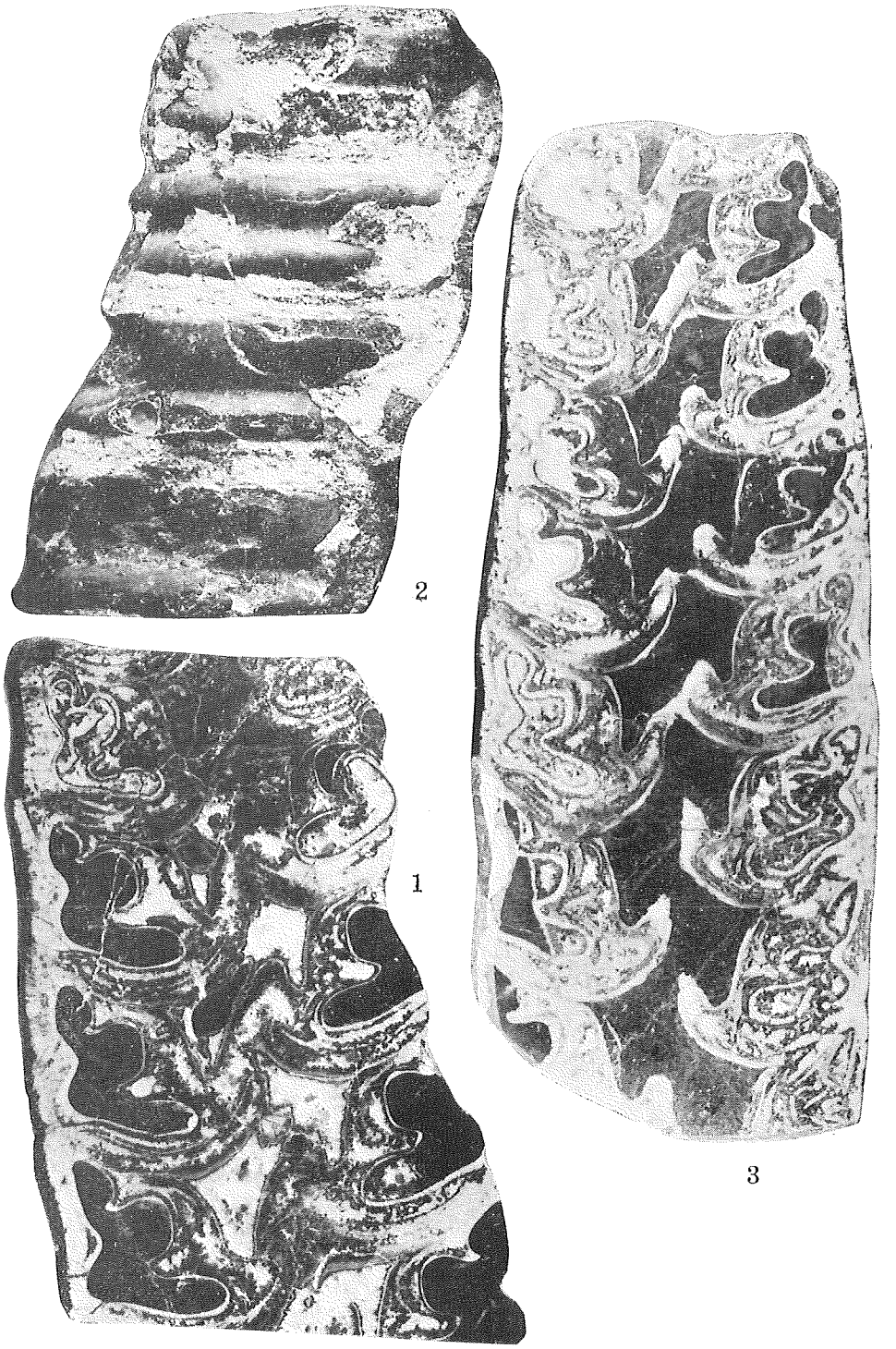
The Upper course of Sôshubetsu-gawa, Shimekapp-mura, Hidaka Province; Orbitolina Limestone

(Figures except 3, in natural size)

**Fig. 1.** One of cotypes, longitudinal section

**Fig. 2.** The external surface of the same specimen

**Fig. 3.** Another specimen of cotypes, longitudinal section. × 0.9



A. Fukada : *Nerinea hidakaensis* Kumano Photo

# Explanation of Plate

# 1 3

## Plate 13

*Nerinea hidakaensis* n. sp.

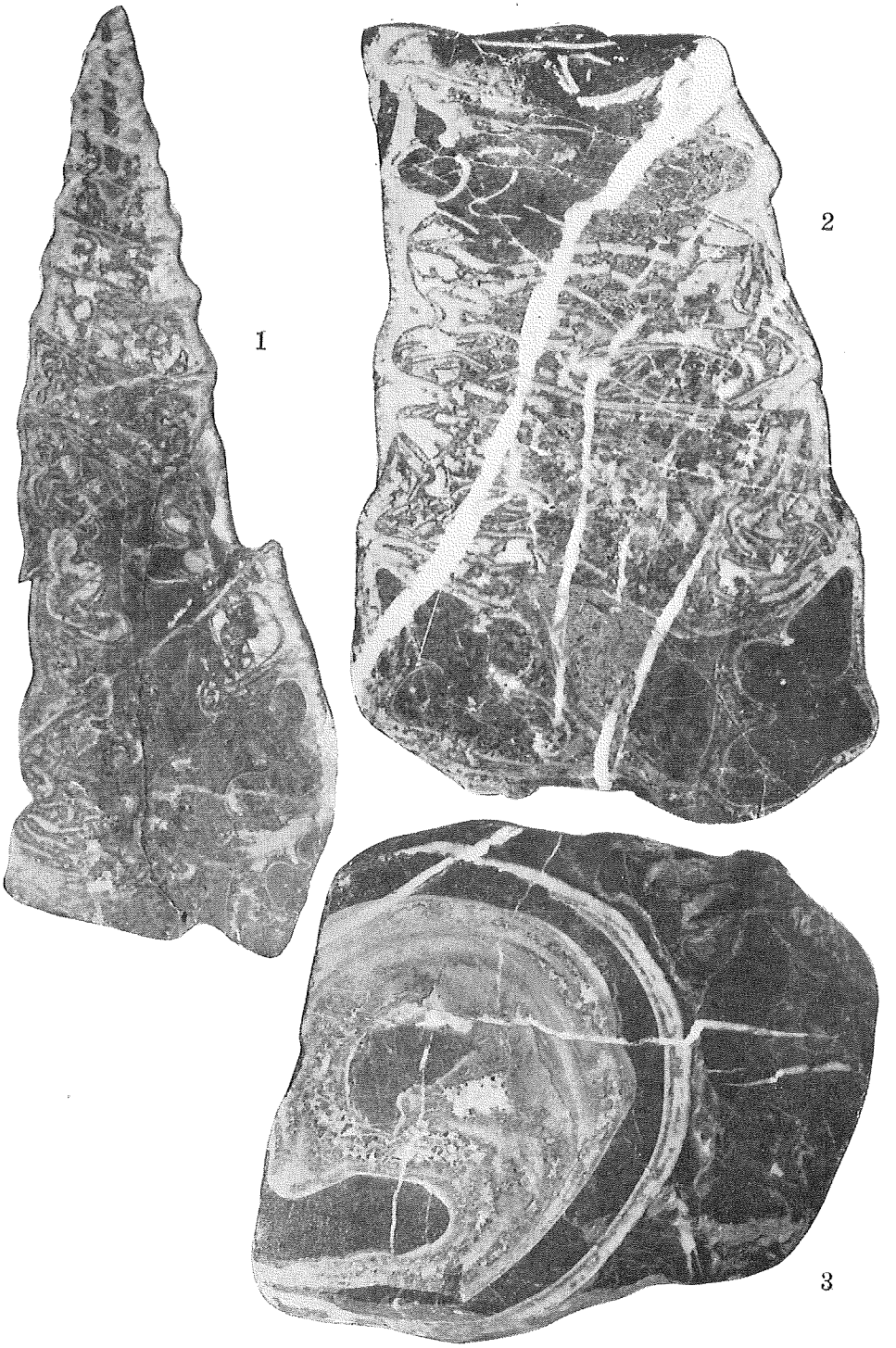
The Upper course of Sôshubetsu-gawa, Shimekapp-mura, Hidaka Province; Orbitolina Limestone

(All figures, in natural size)

**Fig. 1.** The apical part of one of cotypes

**Fig. 2.** The whorls near the aperture

**Fig. 3.** The transverse section of the whorl




A. Fukada: *Nerinea hidakaensis* Kumano Photo