Palaeontologia Electronica
palaeo-electronica.org

Solovievaia nomen novum for *Ovatella* Solovieva pre-occupied and revision of this fossil Foraminifera (Fusulinida, Profusulinellidae)

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ABSTRACT

The name *Ovatella* Solovieva in Rauzer-Chernousova, Bensh, Vdovenko, Gibshman, Leven, Lipina, Reitlinger, Solovieva, and Chediya, 1996, is pre-occupied by the gastropod *Ovatella* Bivona Bernardi, 1832. It is replaced here by *Solovievaia* Vachard and Le Coze nomen novum. Following this nomenclatural modification, a revision of this profusulinellid genus is proposed.

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Keywords: Foraminifera; Fusulinida; new genus name; early Moscovian; palaeobiogeography

Submission: 16 February 2018 Acceptance: 29 May 2018

INTRODUCTION

The genus name *Ovatella* Solovieva in Rauzer-Chernousova, Bensh, Vdovenko, Gibshman, Leven, Lipina, Reitlinger, Solovieva, and Chediya, 1996, (Foraminifera Fusulinida) being pre-occupied is replaced herein by *Solovievaia* Vachard and Le Coze nomen novum. The genus is briefly characterized and analysed.

SYSTEMATIC TAXONOMY

Phylum FORAMINIFERA d'Orbigny, 1826
Class FUSULINATA Fursenko, 1958 nom. correct. Vachard, Krainer, and Lucas, 2013
Subclass FUSULINANA Fursenko, 1958 nom. translat. Vachard, Pille, and Gaillot, 2010
Order FUSULINIDA Fursenko, 1958
Suborder FUSULININA Wedekind, 1937 nom. correct. Loeblich and Tappan, 1961 emend. Vachard, 2016

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Vachard, Daniel and Le Coze, François. 2018. *Solovievaia* nomen novum for *Ovatella* Solovieva pre-occupied and revision of this fossil Foraminifera (Fusulinida, Profusulinellidae). *Palaeontologia Electronica* 21.2.20A 1-6. https://doi.org/10.26879/858
https://palaeo-electronica.org/content/2018/2231-solovievaia-nomen-novum

Superfamily FUSULINOIDEA Möller, 1878 nom. translat. Ciry, 1952 non Miklukho-Maklay, Rauzer-Chernousova and Rozovskaya, 1958
Family PROFUSULINELLIDAE Safonova in Rauzer-Chernousova, Bensh, Vdovenko, Gibshman, Leven, Lipina, Reitlinger, Solovieva, and Chediya, 1996
Solovievaia genus nov.
Nom. nov. pro *Ovatella* Solovieva in Rauzer-Chernousova, Bensh, Vdovenko, Gibshman, Leven, Lipina, Reitlinger, Solovieva, and Chediya, 1996

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Etymology. Named in honor of the eminent Russian micropaleontologist, a specialist on Carboniferous fusulinids, Maria Nikolaevna Solovieva (1920–1994). The genus is feminine.

Type species. *Profusulinella ovata* Rauzer-Chernousova, 1938 (Figure 1). According to Rauzer-Chernousova (1938), the holotype and the figured specimens are deposited in the Museum of the Geological Institute, Academy of Sciences, Moscow; holotype, No. 18; figured specimens: No. 19 and 20.

Translated original Russian diagnosis. Type species—*Profusulinella ovata* Rauser, 1938 (p. 101), Middle Carboniferous, Vereiskiy horizon, Samara Bend, borehole 402, depth 508–511 m. Test ovoid, fairly constant in shape; external whorls with slightly convex sides, internal whorls rounded, truncated or rounded-sharpened. L/D ratio is usually 1.5–1.8 (up to 2.5); number of whorls up to 6–6.5; endothyroid coiling in the first whorls (1–2), uniform in the following whorls; test wall trilayered; septa are planar, in larger forms slightly wavy toward the axial ends; number of septa up to 85 in the fifth whorl; the chomata are usually distinct, rounded, often asymmetrical, less often subquadratic, or weakly developed; the aperture is narrow to moderate, rarely quite wide.

Emended diagnosis. Test involute, ovoid to truncated fusiform, moderately sized, entirely planispiral, or with a short nautiloid juvenarium due to a deviation of the coiling after the second whorl. The lateral slopes are regularly convex. Proloculus spherical and small. Juvenarium of typical aspect among the profusulinellids and schubertelloids ("endothyrid type"). Adult coiling relatively loose. Chambers numerous, wide, and subquadratic. Planar septa in the central parts and only moderately folded near the polar extremities. Chomata generally narrow, low, and asymmetrical. Tunnel narrow to broad, relatively regular. Wall unilayered, dark-microgranular. Aperture simple, terminal, and basal.

Other species. *Profusulinella arta* Leontovich in Rauzer-Chernousova et al., 1951; *P. arta* var. *kamensis* Safonova in Rauzer-Chernousova et al., 1951; *P. carasaica* Dzhenchuraeva, 1979; *P. cavis* Dalmatskaya, 1961; *P. cavis* subsp. *arbejalensis* van Ginkel, 1965; *P. chaohuensis* Wang, 1981; *P. compacta* Rumyantseva, 1974; *P. constans* Safonova in Rauzer-Chernousova et al., 1951; *P. hinodensis* Kobayashi, 1994; *P. montichomata* Sheng and Wang, 1976; *P. muruntavica* Rumyantseva, 1974; *P. nuratavensis* Solovieva, 1977; *P. nuratavenis* forma *longa* Dzhenchuraeva, 1979; *P. omiensis* Watanabe, 1973; *P. ovata* subsp. *meridi-*

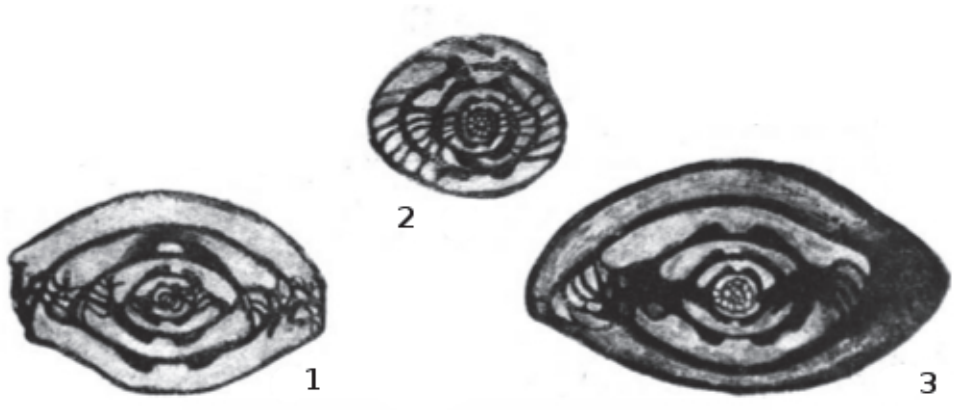

FIGURE 1. Holotype and paratypes of *Solovievaia ovata* (modified from table 1 of Rauzer-Chernousova, 1938). **1.** Axial section, Holotype, borehole No. 402, depth 508–511 m, Vereian Horizon (Substage), x 30, specimen No. 18. **2.** Transverse section, borehole No. 401, depth 543–545 m, Kashirian Horizon, x 30, specimen No. 20. **3.** Axial section of a typical specimen, borehole No. 401, depth 584–585 m, Kashirian Horizon, x 30, specimen No. 19.

ana Bensh, 1969; *P. ovata* var. *nytvica* Safonova in Rauser-Chernousova et al., 1951; *P. ovata* subsp. *penduelensis* van Ginkel, 1983; *P. oblonga* sensu Ivanova, 1999 non Potievskaya, 1964; *Ovatella panjensis* Leven, 1998; *Neofusulinella praecursor* Deprat, 1913; *Profusulinella rhombiformis* var. *ferganensis* Bogush, 1963; *P. sokolensis* Ivanova, 2000; *P. subovata* Safonova in Rauzer-Chernousova et al., 1951; *P. subovata* var. *bosdonica* Rumyantseva, 1974; *P. tchotchiai* Grozdilova and Lebedeva, 1960; and *Profusulinella* sp. A Igo and Adachi, 1981.

DISCUSSION

Phylogeny

Rauzer-Chernousova et al. (1951) identified six groups of species in the genus *Profusulinella* Rauzer-Chernousova in Rauzer-Chernousova, Belyaev and Reitlinger, 1936: *P. ovata* group; *P. parva* group; *P. prisca* group; *P. rhomboides* group; *P. librovitchi* group; and *P. mutabilis* group. The *P. rhomboides* group, which contains the type species, *P. pararhomboidalis* Rauzer-Chernousova in Rauzer-Chernousova, Belyaev and Reitlinger, 1936, corresponds, therefore, to *Profusulinella* sensu stricto. The *librovitchi* group was first described as another genus under the name *Taitzehoella* Sheng, 1951. Then, the *prisca* group was included under the genus *Depratina* Solovieva in Rauzer-Chernousova et al. (1996) and revised by Kulagina (2009), and the *ovata* group was included under the genus *Ovatella* Solovieva in Rauzer-Chernousova et al. (1996). Here, we replace this latter, pre-occupied name by *Solovievaia* nom. nov.

The true *Profusulinella* are more rhombic than the *Solovievaia* and have more developed chomata; they are principally late Bashkirian in age. *Depratina* is more globular with small chomata and is principally earliest Moscovian (Vereian) in age. *Solovievaia* is more ovoid and middle to late early Moscovian in age (Tsninian-Kashirian). *Taitzehoella* is easily differentiated from all these genera by its type of tunnel, aligned and exhibiting a regular increasing in width between symmetrical chomata.

Many species of the *parva* group (including *P. parva* itself) and some species of the group *mutabilis* (such as *P. arta* and *P. arta kamensis*) were assigned to *Solovievaia/Ovatella* by Isakova (2001); this assignment is relatively disputable in relation to the criteria of Rauzer-Chernousova et al. (1951, 1996).

Occurrence

Early middle Pennsylvanian (middle to late Moscovian) in Western and Central Palaeotethys (northern Spain [Spanish Basque Pyrenees]: Delvolvé et al., 1987; Cantabrian Zone: van Ginkel, 1983; Villa, 1995; southern Turkey: Altiner, 1981; Kobayashi, 2011; Tunisia: Ghazzay-Souli et al., 2015; Iran: Leven and Gorgij, 2011; Darvaz: Leven, 1998); Moscow Basin (Rauzer-Chernousova et al., 1951; Isakova, 2001); the southern, central, and northern Urals (Grozdilova and Lebedeva, 1960; Grozdilova et al., 1975; Malakhova, 1980; Ivanova, 1999, 2000, 2008); Kazakhstan (Marfenkova, 1991); Southwestern Siberia (Bogush, 1963); Uzbekistan (Bensh, 1969; Rumyantseva, 1974; Solovieva, 1977); Kyrgyzstan (Dzhenchuraeva, 1979); Tarim (Zhao et al., 1984); North China (Wang et al., 1992); South China (Shen et al., 1976; Zhang and Rui, 1980; Wang, 1987); northern Thailand (Vachard et al., 1992; Ueno and Igo, 1997), Vietnam (Deprat, 1913; Nguyen Van Liêm, 1967); Laos (Deprat, 1913); and Japan (Watanabe, 1973; Igo and Adachi, 1981; Kobayashi, 1994). In our opinion, the forms of the USA, such as for example *Profusulinella marblensis* Thompson, 1947, more probably belong to *Depratina* rather than to *Solovievaia/Ovatella* sensu stricto (see Kulagina, 2009). Contrary to Solovieva in Rauzer-Chernousova et al. (1996), we infer that *Solovievaia* is not present in the USA.

CONCLUSION

Solovievaia is a nomen novum for *Ovatella* Sosnina, pre-occupied. This genus differs from *Depratina* and *Profusulinella* by morphological characters of the test and the coiling. *Solovievaia* is the more advanced form of the profusulinellid lineages. It appears in the late Vereian, but is particularly common in the Kashirian. *Solovievaia* probably appeared in the southern Urals due to the continuity of the lineages in this area. Then, it migrated along the entire Urals to Timan, and to the northern border, Perilaurentian, of the Paleotethys from the Basque Pyrenees (France-Spain border) and Cantabrian Zone (northern Spain) to Central Asia (Kyrgystan; Tarim). It has very rarely been mentioned on the southern, Perigondwanan border of the Paleotethys (Tunisia, southern Turkey; and currently was rarely found in Iran). It also migrated to the Eastern Paleotethyan North China, South China and Indonesia blocks, and some Panthalassan localities of Japan, via probably North China. Nevertheless, it is absent from the Ameri-

cas, both in the northern seaway via connections with the northern Urals, and in the southern seaway in the southern part of USA, Mexico and northern part of South America (e.g., Colombia and Venezuela), where only *Depratina* and true *Profusulinella* are known.

ACKNOWLEDGEMENTS

Thanks to A.B. Doweld for providing several Russian references, and to E. Kulagina and the Editorial Board of Palaeontologia Electronica for their constructive criticisms and advice.

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