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TAXONOMIC REVISION OF *PSEUDOLITUONELLA MARIAE* GENDROT, 1968 (FORAMINIFERA) FROM THE SANTONIAN OF SOUTHERN FRANCE

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Abstract. *Pseudolituonella mariae* Gendrot from the Santonian of southern France represents the only post-Cenomanian Upper Cretaceous species of the genus. The test morphology, inner and wall structure however are not in conformity with the characteristic features of *Pseudolituonella* Marie. *P. mariae* is taxonomically revised and transferred to the genus *Gerochella* Neagu thereby becoming the second species of the genus besides the lowermost Cretaceous Romanian type-species *G. cylindrica*. Other specimens of *Gerochella* described in open nomenclature from the late Maastrichtian of SW Iran show that the genus was widely distributed in Cretaceous shallow-water carbonates.

Keywords: Foraminifera, taxonomy, Upper Cretaceous, France

INTRODUCTION

The Upper Cretaceous (Coniacian–Santonian) strata exposed in the southeastern part of France are known for its richness in (larger) benthic foraminifera (Marie, 1959; Maync, 1959; Gendrot, 1963, 1964, 1968). In her monographic work, Gendrot (1968) described six new species among *Pseudolituonella mariae* dedicated to P. Marie the author of the genus *Pseudolituonella*. Afterwards, *P. mariae* was not recorded again in the literature. The belonging of the French taxon to *Pseudolituonella* was already considered as uncertain by Schlagintweit & Yazdi-Moghadam (2020). In fact, the features of the French species fit very well to the genus *Gerochella* established by Neagu (1997) from the lowermost Cretaceous of Romania (Fig. 1.1-1.2) leading to the proposed new combination *Gerochella mariae* (Gendrot).

SYSTEMATIC PALAEONTOLOGY

Phylum Foraminifera d'Orbigny, 1826
Order Loftusiida Kaminski & Mikhalevich in Kaminski, 2004
Suborder Ataxophragmiina Fursenko, 1958
Superfamily Ataxophragmiaceae Schwager, 1877
Family Ataxophragmiidae Schwager, 1877
Subfamily Gerochellinae Kaminski 2004

Definition of the monogeneric subfamily: *Test with a trochospiral early stage with 4 chambers per whorl; an intermediate short irregularly uniserial stage with 2-3 chambers, and a(n) uniserial adult stage* (Kaminski, 2004, p. 251).

Genus ***Gerochella*** Neagu, 1997
Type-species: *Gerochella cylindrica* Neagu, 1997

Gerochella mariae (Gendrot, 1968) comb. nov.
(Fig. 1.3-1.8)

1968 *Pseudolituonella mariae* sp. nov. – Gendrot, p. 678-679, pl. 6, figs. 4-12.

Description (Gendrot, 1968, p. 678): "*Le test est formé de loges enroulées en une trochospire au départ, puis unisériées, à section circulaire. L'ouverture est constituée par un crible qui comprend une quinzaine de gros pores espacés, limités à la partie centrale de la face aperturale de la dernière loge*". The test is composed of chambers initially coiled in a trochospiral arrangement, then becoming uniserial, with a circular cross-section. The aperture consists of a sieve with about fifteen large, spaced pores, restricted to the central part of the apertural face of the last chamber (English translation).

Dimensions: Test length = 0.60 mm to 1.0 mm; length of the trochospiral stage = 0.45 mm to 0.60 mm; test diameter = 0.60 mm to 0.80 mm.

Remarks: Although the general test morphology is similar to *Pseudolituonella* Marie, '*Pseudolituonella*' *mariae* Gendrot is not compatible with the characteristics of the genus because of its prominent trochospiral stage, the (obvious) lack of any apertural rims surrounding the foramina and stretching into the chamber lumen, and the lack of a pseudokeriothecal wall structure (Fig. 1.14-1.17). The latter feature, however, is rarely preserved in the Cenomanian type-species *Pseudolituonella reicheli* Marie (Schlagintweit & Yazdi-Moghadam, 2020). Instead, the Santonian species fits well to the genus *Gerochella* (type-species *G. cylindrica* Neagu, 1997) described from the uppermost Berriasian to lower Valanginian of Romania. Interestingly, already Neagu (1997) compared his new genus *Gerochella* with *Pseudolituonella*. With the tranferation of *P. mariae* to the genus *Gerochella*, the post-Cenomanian Upper Cretaceous strata now lack any representative of

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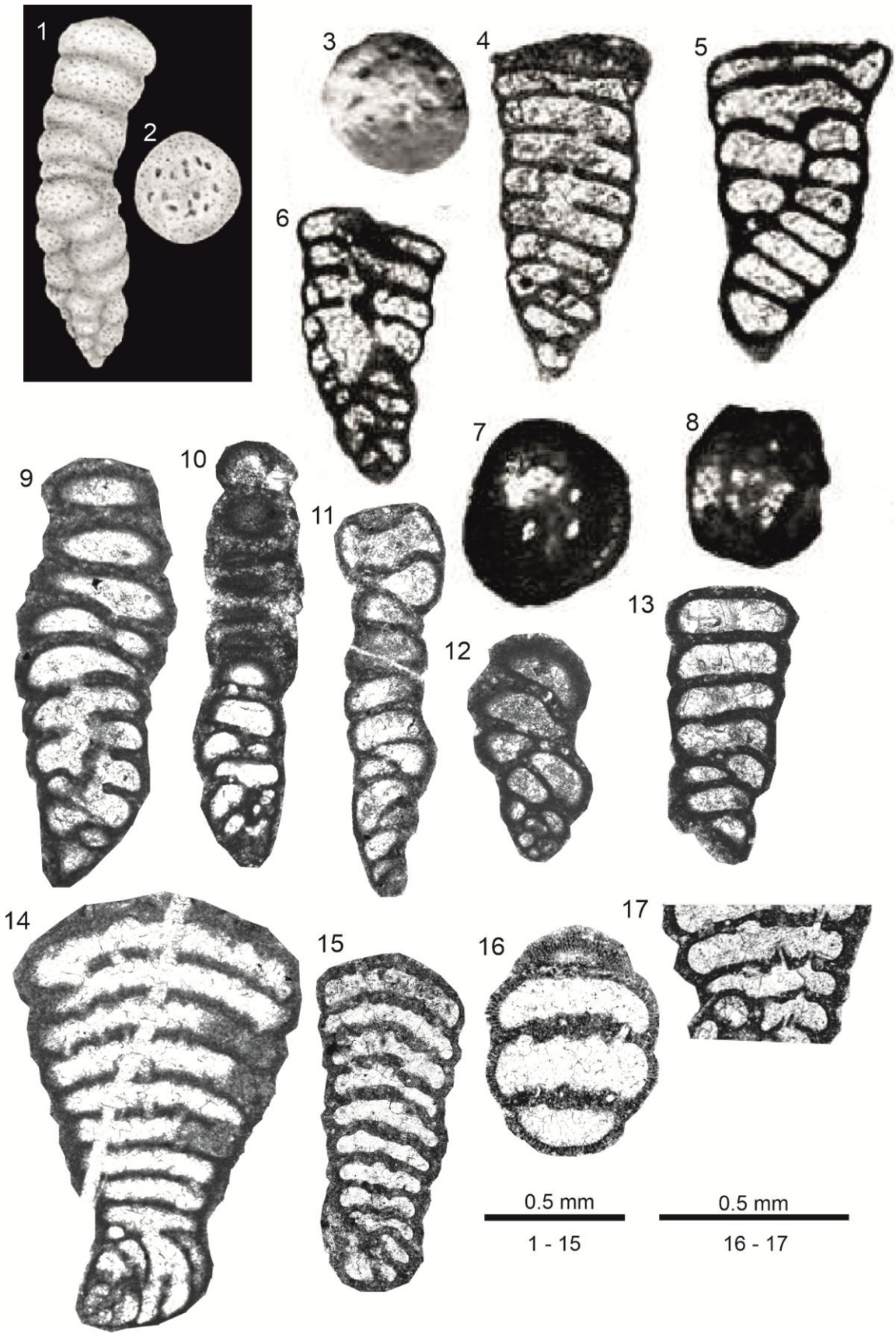

Fig. 1. **1-2:** *Gerochella cylindrica* Neagu, latest Berriasian–early Valanginian of Romania (from Kaminski, 2000, fig. 27, extracted from Neagu, 1997, fig. 1.39 and 1.41). **3-8:** *Gerochella mariae* (Gendrot) comb. nov. (from Gendrot, 1968, pl. 6, figs. 5-10; Copyright by Swiss Geological Society), Santonian of southern France. **9-13:** *Gerochella* sp., late Maastrichtian Tarbur Formation of southwestern Iran. **14-17:** *Pseudolituonella reicheli* Marie, middle–late Cenomanian Sarvak Formation of southwestern Iran.

Pseudolituonella, re-appearing later in the Eocene with the large-sized *P. robineti* (Serra-Kiel et al., 2016).

Comparisons: As the name implies, *G. cylindrica* has a cylindrical test while in *G. mariae* the chambers of the uniserial stage are continuously widening resulting in a high-conical test morphology. Therefore, the test thickness of *G. cylindrica* is distinctly smaller (0.24 mm to 0.29 mm) than in *G. mariae* while the length is in a comparable range (0.48 mm to 1.36 mm). The specimens of *Gerochella* reported in open nomenclature from the upper Maastrichtian Tarbur Formation of SW Iran (Fig. 1.9 to 1.13) attain a length of up to 1.65 mm with a maximum diameter of 0.55 mm. From the Campanian of Croatia (Island of Brač), rare specimens comparable to the Maastrichtian forms were observed (unpublished results).

CONCLUSIONS

The so far monospecific lowermost Cretaceous genus *Gerochella* Neagu now gets a second Upper Cretaceous species with *Gerochella mariae* (Gendrot) differing from *G. cylindrica* Neagu mainly by its conical test morphology. The presence of representatives of *Gerochella* in the Campanian of Croatia and Maastrichtian provides evidence that it had a rather wide distribution in Cretaceous shallow-water carbonates.

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