

# *Paratrochamminoides waskowskiae* n. sp., a new deep-water agglutinated foraminifera from the Paleocene of the Tasman Sea

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**ABSTRACT:** A new species belonging to the genus *Paratrochamminoides* is here described from the Paleocene at IODP Site U1511 in the Tasman Sea. The species *Paratrochamminoides waskowskiae* n.sp. is characterized by its streptospiral coiling and elongated pseudochambers. A key to the identification of the *Paratrochamminoides* species is provided. Species are identified on the basis of their chamber shape and predominant mode of coiling.

**Key words:** Foraminifera, Paleocene, Tasman Sea, Taxonomy.

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## INTRODUCTION

The genus *Paratrochamminoides* is a common component of Late Cretaceous and Paleogene abyssal agglutinated assemblages in the world ocean (Kaminski and Kuhnt 2004). First described by Grzybowski (1896, 1898, 1901) under the name “*Trochammina*” from the Carpathian flysch deposits, species that are currently assigned to the genus *Paratrochamminoides* have subsequently been described from Mexico (Cushman 1926), the abyssal Indian and Pacific Oceans (Krashenninikov 1973, 1974), and offshore Angola (Kender et al. 2006). Even now, because of difficulties in recognizing the various species, many forms that belong to the genus are simply left in open nomenclature, reported as “*Paratrochamminoides* spp.”.

The purpose of this paper is to describe a new species of *Paratrochamminoides* from the Tasman Sea, and to provide a key to assist in the identification of the various Cretaceous to Paleogene *Paratrochamminoides* species from deep-water sediments.

## STUDY AREA

IODP Site U1511 was drilled during Expedition 371 in the northeastern Tasman Sea, namely at coordinates 37.5611°S and 160.3156°E. Drilling took place at a water depth of 4847 m. The location of the site is in the Tasman Abyssal Plain, which is on the opposite side of the DSDP Site 283 on the conjugate margin. Hole U1511B underwent drilling operations, resulting in the extraction of 47 cores. The combined length of these cores amounted to 431.4 meters, and the average amount of core material successfully recovered was 65% (Sutherland et al. 2019). According to paleogeographic and paleobathymetric reconstructions, Site U1511 has been situated at abyssal depths since the Paleocene. In contrast, the Lord Howe Rise region had

bathyal and even shallower environments during the same period (Sutherland et al. 2020). Currently, this location is situated far below the regional lysocline (Bostock et al. 2011).

The lower Paleocene to lower Eocene claystones from Cores U1511B-33R to U1511B-47R at Site U1511 include a variety of benthic foraminiferal assemblages. These assemblages are mostly composed of agglutinated foraminifera that display excellent preservation (Kaminski et al. 2021), making them suitable for detailed taxonomic study.

## METHODS

A comprehensive analysis was conducted for sixty samples from IODP Hole 1511B. Sample disaggregation was performed by simmering in a solution of sodium carbonate and water. Foraminiferal content was examined and individuals >125 microns in size were isolated and glued into cardboard microslides. Plesiotypes were photographed using a JEOL JCM-7000 scanning electron microscope housed at KFUPM Micropaleontology Lab. Permanent storage of microscopic specimens will be maintained at the European Micropaleontological Reference Centre in Kraków, Poland.

## SYSTEMATIC TAXONOMY

Suborder AMMODISCINA Mikhalevich 1980  
Superfamily LITUOTUBOIDEA Loeblich and Tappan 1984  
Family LITUOTUBIDAE Loeblich and Tappan 1984  
Genus *Paratrochamminoides* Soliman 1972

*Paratrochamminoides waskowskiae* Kaminski, Korin and Hikmahtiar, n. sp.  
Plate 1, figures 1a–5c

TABLE 1

Examples of non-chambered (ammodiscids) and pseudochambered (*Paratrochamminoides* and *Trochamminoides*) species (with elongated or rounded chambers) based on the mode of coiling.

Coiling mode	ammodiscids	<i>Paratrochamminoides/ Trochamminoides</i>	
		Elongated chambers	Rounded chambers
Irregularly planispiral	<i>Ammodiscus</i> spp. Reuss, 1862	<i>T. kaminskii</i> Anjos-Zerfass, Cetean, Mouro, Ng, Zerfass, and Moreira, 2022 <i>T. dubius</i> (Grzybowski, 1901) <i>T. septatus</i> (Grzybowski, 1898) <i>T. velascoensis</i> (Cushman, 1926) <i>T. folius</i> (Grzybowski, 1898)	<i>T. proteus</i> (Karrer, 1866) <i>T. grzybowskii</i> Kaminski and Geroch, 1992
glomospiral	<i>Glomospira gordialis</i> (Jones and Parker, 1860)	<i>P. olszewskii</i> (Grzybowski, 1898) <i>P. semipellucidus</i> Krashenninikov, 1973	<i>P. vitreus</i> Krashenninikov, 1973 <i>P. corpulentus</i> Krashenninikov, 1973 <i>P. deflexiformis</i> (Noth, 1912) emend. Kender et al. 2005
milioline	<i>Glomospira serpens</i> (Grzybowski, 1898)	<i>P. gorayskii</i> (Grzybowski, 1898) <i>P. gorayskiformis</i> Kender, Kaminski and Jones, 2006	<i>P. mitratus</i> (Grzybowski, 1901)
trochospiral	<i>Arenoturrspirillina</i> spp. Tairov, 1956	Not observed	<i>P. acervulatus</i> (Grzybowski, 1896) <i>P. heteromorphus</i> (Grzybowski, 1898) <i>P. uviformis</i> (Grzybowski, 1901)
streptospiral	<i>Glomospira irregularis</i> (Grzybowski, 1898)	<b><i>P. waskowskiae</i> n.sp.</b>	<i>P. intricatus</i> Krashenninikov, 1973, 1974
thalmanamminiiform	<i>Arenomeandrospira</i> spp. Jones and Wonders, 2000	Not observed	<i>Paratrochamminoides</i> sp. 5 of Kaminski and Kuhnt, 2004

**Diagnosis:** Differs from other species of *Paratrochamminoides* with elongated chambers in possessing streptospiral coiling.

**Description:** Test free, coiling is irregularly streptospiral. Chambers are elongated tubular, with visible constrictions. Wall medium to finely agglutinated with a smooth surface, imperforate, with organic cement. Aperture a round areal opening, the open end of the tube.

**Remarks:** Differs from *Glomospira irregularis* (Grzybowski) in possessing elongated pseudochambers that have visible constrictions.

**Derivation of name:** In honour of Prof. Anna Waškowska (AGH), our co-author on a previous study of the agglutinated foraminifera from Site U1511 (Kaminski et al. 2021).

**Type Locality:** IODP Site U1511 (4847 m water depth) in the northeastern Tasman Sea (37.5611°S, 160.3156°E).

**Type Level:** Sample U1511B-42R-2W, 60-62 cm, late Paleocene.

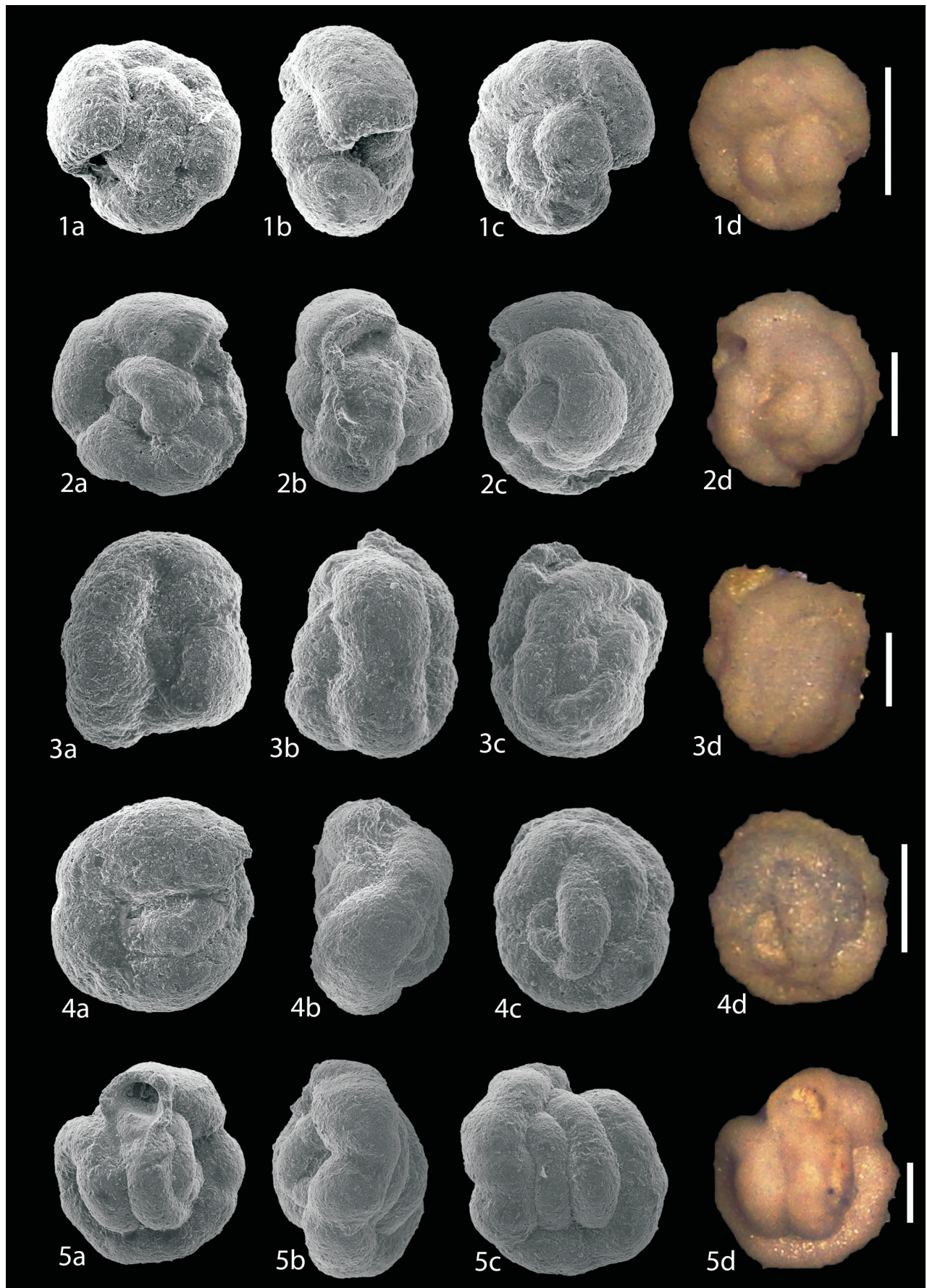
**Type Specimens:** Deposited in the collection of primary types at the European Micropalaeontological Reference Centre,

**PLATE 1**

Type specimens of *Paratrochamminoides waskowskiae* n. sp.  
All specimens are from Sample U1511B-42R-2W, 60-62 cm, late Paleocene.  
Scale bars = 100 microns.

1a-c Holotype, (EMRC 7/11c-7).

2a-5a Paratypes (EMRC 7/11c-8). Figures a-c are SEM images, figure d is a light microcope image.



Kraków, Poland. The holotype is registered as 7/11c-8. Figured paratypes are registered as 7/11c-7.

## DISCUSSION

Our discovery of a streptospirally-coiled species of *Paratrochamminoides* at Site U1511 fills in a gap in the matrix of possible morphologies and coiling modes displayed by the known species (Table 1). The species belonging to the genus *Paratrochamminoides* are primarily recognized based on the predominant coiling mode and the length of the pseudochambers (Kaminski and Kuhnt 2004). The coiling mode may be mostly planispiral in the case of *Trochamminoides*, or “enrolled” as in the case of *Paratrochamminoides* (Loeblich and Tappan 1987). The differences in coiling between *Trochamminoides* and *Paratrochamminoides* are comparable to those between *Glomospirella* and *Glomospira*. Species with two or more planispiral whorls are placed in *Trochamminoides*, though the initial whorls may be slightly irregular. Although the coiling in *Paratrochamminoides* has been simply described as “enrolled” (Loeblich and Tappan 1987), there is often a dominant and recognizable coiling mode that aids in the identification of species. The group of *Paratrochamminoides* that possesses elongated chambers has recognizable isomorphs among the ammodiscids, such that for example *P. gorayskii* (Grzybowski) and *P. gorayskiformis* Kender, Kaminski, and Jones have the same coiling mode as *Glomospira serpens* (Grzybowski). In the case of our new species, the equivalent species of *Glomospira* is *G. irregularis* (Grzybowski). Based on the “missing species” in Table 1, we predict that a trochospirally-coiled form with elongated chambers will be discovered in the future.

## CONCLUSIONS

We provide a formal description for the new species *Paratrochamminoides waskowskiae*, n.sp., a species that displays streptospiral coiling and elongated pseudochambers. The species fills a gap in the matrix of coiling modes that are possible among the *Paratrochamminoides*, and is the pseudochambered isomorph of *Glomospira irregularis* (Grzybowski). The species is known from the Paleocene of IODP Site U1511 in the Tasman Sea, but because the genus is cosmopolitan in deep-water assemblages, it likely has a wider geographical distribution.

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