

# *Buzasina antarctica* n. sp., a new lituolid foraminifer from the Upper Cretaceous at IODP Site 1512, Great Australian Bight

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**ABSTRACT:** The new foraminiferal species *Buzasina antarctica* n.sp. is described from the Upper Cretaceous (Turonian) from IODP Site U1512 drilled in the Great Australian Bight. Compared with the type species, the new species is characterized by its larger dimensions, greater number of chambers, and less embracing final chamber. It is the only representative of the genus *Buzasina* found thus far in the Cretaceous of the high austral latitudes.

**Keywords:** IODP Site 1512, Foraminifera, taxonomy, new species, Cretaceous, Australia.

## INTRODUCTION

The genus *Buzasina* Loeblich and Tappan is a deep-water agglutinated foraminifer, known from the Upper Cretaceous abyssal plain deposits of the Pacific and Indian Oceans (Krashenninikov 1973, 1974) and from Cretaceous to Eocene basinal deposits in the North Atlantic and Western Tethys (Bubík 1995, 2019; Kaminski et al. 2011; Setoyama and Kaminski 2015; Waśkowska 2015; Waśkowska et al. 2018). Modern representatives of the genus can be found beneath the CCD throughout the world ocean (Brady 1884; Jones 1994).

IODP expedition 369 (Australia Cretaceous Climate and Tectonics) to the Great Australian Bight recovered the first high southern latitude record of DWAF at Site U1512. The Cretaceous foraminiferal assemblages are diverse, and contain an admixture of species known from the Tethyan Cretaceous (such as *Uvigerinammina*) as well as some enigmatic forms that may be endemic to the area. In this paper we describe a new species of *Buzasina* from the Turonian of Hole U1512A.

## Study Area

IODP Expedition 369 drilled Hole U1512A in the area of the Great Australian Bight, with the purpose of documenting the break-up between Australia and Antarctica, and the paleoceanographic evolution of this sector of the Southern Ocean. The breakup of Eastern Gondwana and the formation of the Australo–Antarctic Gulf during the Late Cretaceous was followed by accelerated subsidence from the Albian onwards. The restricted, high-latitude paleogeographic setting favored a diverse deep water agglutinated foraminiferal fauna. Sediment recovered at Site U1512 records the Late Cretaceous history of the Australo–Antarctic Gulf, which is characterized by the gradual opening of this ocean basin. Site U1512 was drilled in 3070.9 meters of water (text-fig. 1), and recovered 631.86 meters of Cretaceous (lower Turonian through Santonian) sediment (Huber et al. 2019). The sediment consists of a uniform

succession of dark siltstone and claystone, which is largely noncalcareous. The microfossil assemblages consist of diverse agglutinated foraminifera with rare calcareous benthic and planktonic foraminifera in some samples. The age assignments were made based on the calcareous nannofossils (Huber et al. 2019). The report of the complete foraminiferal assemblage from Hole U1512A will be the subject of a future paper.

## METHODS

Cores from IODP Hole U1512A were sampled at a resolution of 3 samples per core for micropaleontology. The 20-cc samples were disaggregated by boiling in a soap and water solution, and sieved over a 45 micron screen. Samples were picked from the >125 micron fraction, and microfossils were mounted into standard cardboard faunal slides. Selected specimens were photographed using a Nikon SMZ-1500 photomicroscope with a Nikon DS-Ri2 digital camera.

## SYSTEMATIC TAXONOMY

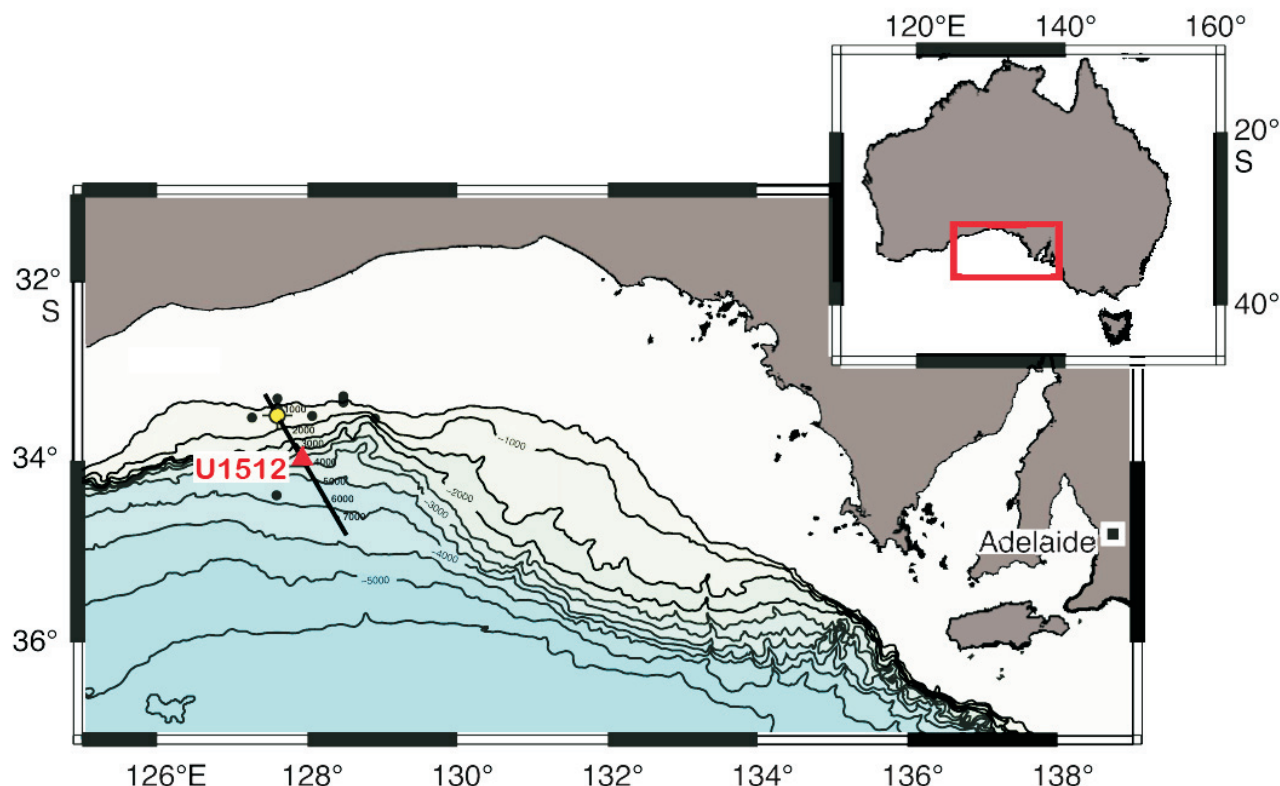
Suborder LITUOLINA Lankester 1885  
Superfamily LITUOLOIDEA de Blainville 1827  
Family HAPLOPHRAGMOIDIDAE Maync 1952  
Genus *Buzasina* Loeblich and Tappan 1985

*Buzasina antarctica* Kaminski, Wolfgring and Waśkowska, n. sp.  
Plate 1, figures 1a–5b

*Material:* 20 specimens from nine samples.

*Derivation of Name:* Named after the southern continent of Antarctica.

*Description:* Test free, planispirally enrolled, five to six rapidly enlarging chambers in two to three whorls, final chamber comprising about one-third the test. Sutures radial and straight, depressed. Umbilicus depressed. Wall thin, finely agglutinated, consisting of equidimensional silt grains with considerable ce-



TEXT-FIGURE 1

Locations of Site U1512, Jerboa-1 commercial well (yellow circle), and ODP Leg 182 sites (black circles), modified after Huber et al. (2019).

ment. Aperture areal, equatorial, and arched, with downturned corners of the arch, completely bordered by a thin lip.

*Remarks:* The genus *Buzasina* differs from *Trochammina* and *Cystammina* in being planispiral, from *Haplophragmoides* in possessing an areal aperture, and from *Labrospira* in its very fine-grained wall, with few chambers per whorl that increase rapidly in size as added, and in its deep water habitat.

The current species shows features that are transitional to *Labrospira* – the wall is finely agglutinated, but perhaps not as finely agglutinated as the type species of *Buzasina*, (*Trochammina ringens* Brady, 1879). Additionally, compared

with *B. ringens*, the new species has on average one extra chamber per whorl, and the final chamber embraces the early part of the test to a lesser degree. It has a depressed umbilicus, whereas in the type species the final chamber covers the umbilicus. Nevertheless, considering its wall structure and apertural features, we prefer to assign it to the genus *Buzasina*, rather than to *Labrospira*.

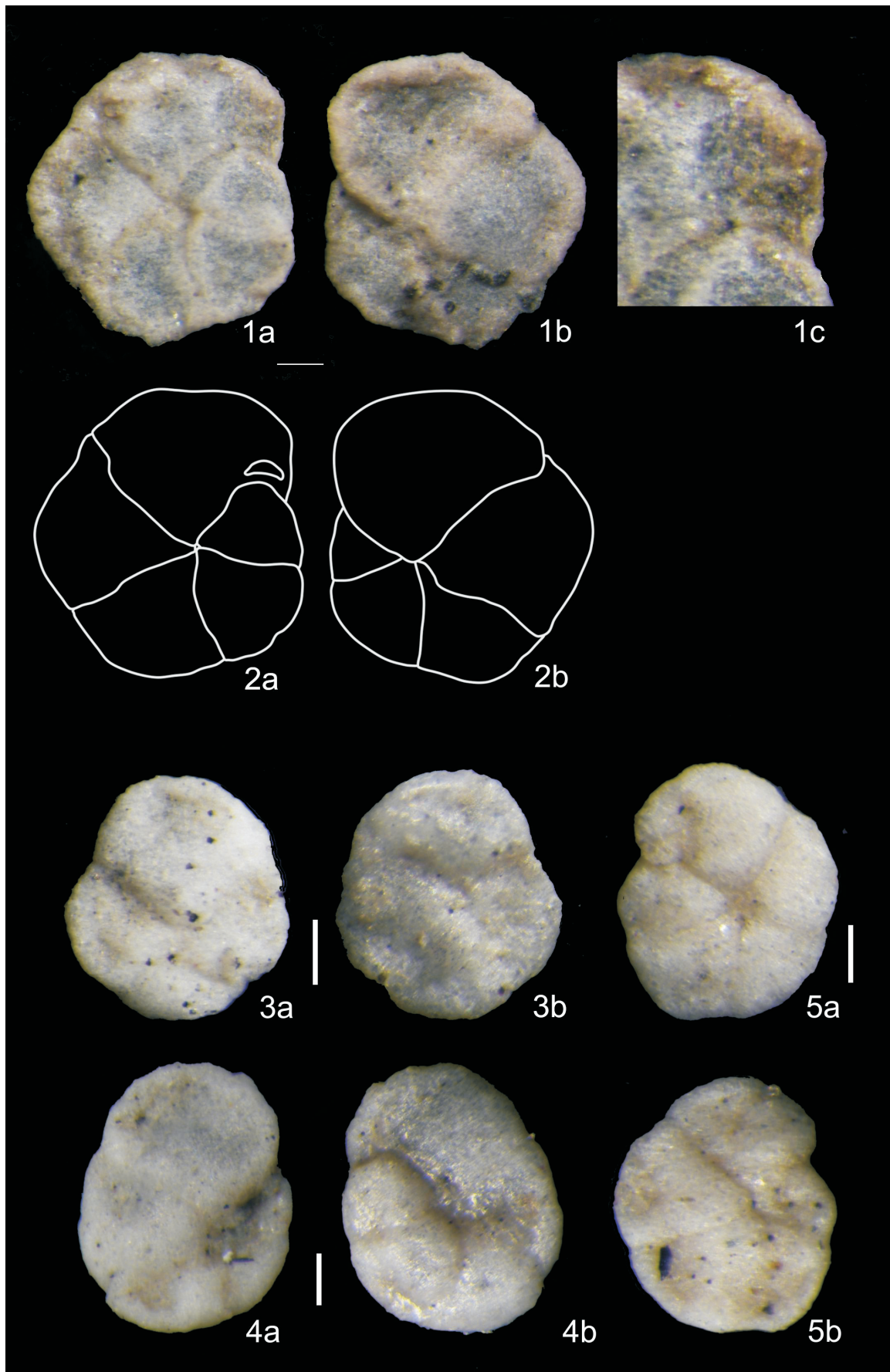
*Type Level:* Turonian. The holotype is from Sample U1512A, 48R-1W, 40-44 cm. Most specimens are from samples collected from Cores U1512A-42R to -50R, with an age of mid-Turonian.

## PLATE 1

Type specimens of *Buzasina antarctica* n.sp. from the Great Australian Bight, all scale bars are 100 microns.

1a-2b Holotype, sample U1512A, 48R-1W, 40-44 cm. 1a-c. Lateral views of the holotype with details of the aperture. Image 2a-b is a sketch of the holotype showing the position of the aperture.

3a-5b Paratypes, Sample U1512A, 46R-1W, 41-45 cm, lateral views. In image 4b, an areal aperture in the shape of the letter D rotated 135° counterclockwise is visible in the center of the apertural face.



*Type Locality:* IODP Site U1512, Great Australian Bight, Southern Ocean.

*Type Specimens:* Deposited in the European Micropaleontological Reference Centre, Kraków Poland, and cataloged as numbers 7/21a/4 (holotype) and 7/21a/5 (figured paratypes).

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## REFERENCES

- BUBÍK, M., 1995. Cretaceous to Paleogene agglutinated foraminifera of the Bilé Karpaty Unit (West Carpathians, Czech Republic). In: Kaminski, M. A., Geroch, S. and Gasinski, M. A., Eds., *Proceedings of the Fourth International Workshop on Agglutinated Foraminifera*, 71–116. London: Grzybowski Foundation Special Publication, 3.
- , 2019. Remarks on the quantitative analysis of deep-sea agglutinated foraminiferal taphocoenoses with special attention to tubular astrophorids. *Micropaleontology*, 65: 63–74.
- BRADY, H. B., 1879. Notes on some of the Reticularian Rhizopoda of the “Challenger” Expedition. Part I. On new or little known arenaceous types. *Quarterly Journal of Microscopical Science*, new ser. 19: 20–63.
- , 1884. Report on the foraminifera dredged by H.M.S. CHALLENGER during the years 1873–1876. In: Murray, J. Ed., *Reports of the scientific results of the voyage of the H.M.S. Challenger*. Zoology, 9, 1–814.
- HUBER, B. T., HOBBS, R. W., BOGUS, K. A., BATENBURG, S. J., BRUMSACK, H.-J., DO MONTE GUERRA, R., EDGAR, K. M., EDVARDSEN, T., GARCIA TEJADA, M. L., HARRY, D. L., HASEGAWA, T., HAYNES, S. J., JIANG, T., JONES, M. M., KURODA, J., LEE, E. Y., LI, Y.-X., MACLEOD, K. G., MARITATI, A., MARTINEZ, M., O'CONNOR, L. K., PETRIZZO, M. R., QUAN, T. M., RICHTER, C., RIQUIER, L., TAGLIARO, G. T., WAINMAN, C. C., WATKINS, D. K., WHITE, L. T., WOLFGRING, E. and XU, Z., 2019. Site U1512. In: Hobbs, R. W., Huber, B. T., Bogus, K. A., and the Expedition 369 Scientists *Proceedings of the International Ocean Discovery Program*, 369, doi.org/10.14379/iodp.proc.369.103.2019.
- LOEBLICH, A. R., Jr. and TAPPAN, H., 1985. Some new and redefined genera and families of agglutinated foraminifera I. *Journal of Foraminifera Research*, 15: 91–104.
- JONES, R. W., 1994. *The Challenger Foraminifera*. Oxford University Press. 149 pp + 117 pl + 5 figs.
- KAMINSKI, M. A., CETEAN, C. G. BĂLC, R. and COCCIONI, R., 2011. Upper Cretaceous Deep-Water Agglutinated Foraminifera from the Contessa Highway Section, Umbria-Marche Basin, Italy: Taxonomy and Biostratigraphy. In: Kaminski, M.A. & Filipescu, S., Eds., *Proceedings of the Eighth International Workshop on Agglutinated Foraminifera*, 71–106. London: Grzybowski Foundation Special Publication, 16.
- KRASHENNINIKOV, V. A., 1973. Cretaceous benthonic foraminifera, Leg 20, Deep Sea Drilling Project. *Initial Reports of the Deep Sea Drilling Project*, 20: 205–221.
- , 1974. Upper Cretaceous benthonic agglutinated foraminifera, Leg 27, Deep Sea Drilling Project. *Initial Reports of the Deep Sea Drilling Project*, 27: 631–661.
- SETOYAMA, E. and KAMINSKI, M. A. 2015. Upper Cretaceous agglutinated foraminifera from a red interval in the southern Norwegian Sea. *Micropaleontology*, 61 (3): 237–256.
- WAŚKOWSKA, A. 2015. The Eocene Hieroglyphic Beds of the Silesian Nappe in the Western Polish Carpathians – their development and foraminiferal record. *Geological Quarterly*, 59: 271–299.
- WAŚKOWSKA, A., GOLONKA, J., MACHOWSKI, G., and PSTRUCHA, E. 2018. Potential source rocks in the Ropianka Formation of the Magura Nappe (Outer Carpathians, Poland) – geochemical and foraminiferal case study. *Geology, Geophysics & Environment*, 44 (1): 49–69.