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RESEARCH ARTICLE

BOLIVINOIDESELLA: A NEW ROTALIID BENTHIC FORAMINIFERAL GENUS

Haidar Salim Anan*

Department of stratigraphy and paleontology, former Vice president of Al Azhar University-Gaza, Palestine.
Corresponding Author Email: profanan@gmail.com

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ABSTRACT

This study describes the new Paleocene Rotaliid genus *Bolivinoidesella* of sample ODP 198-drilled on the Southern High of Shatsky Rise, Site 1210A- 24H-4(30–32), 219.70, Pacific Ocean, which located at tropical latitudes (~10ºN) around the K/Pg boundary from lower bathyal–upper abyssal environment (1500–2000 m). It is characterized by finely perforate calcareous wall with elongate large biserial test, nearly globular chambers increasing rapidly as added, surface ornamented with wrinkles, sutures obscured in the lower part of the test, but slightly depressed in the upper part, narrow opening basal aperture. The new genus *Bolivinoidesella* differs from the genus *Bolivinoides* by elongate test, wrinkled rugose ornamented surface than rhomboidal test with longitudinal costae may bifurcated distally.

KEYWORDS

Benthic foraminifera, Rotaliid, *Bolivinoidesella*, Paleogene, Pacific Ocean

1. INTRODUCTION

The present study is mainly devoted to the systematic description of the new genus *Bolivinoidesella* related Paleocene species from sample ODP 198-drilled on the Southern High of Shatsky Rise, Site 1210A- 24H-4(30–32), 219.70, Pacific Ocean, Figure 1 (after Alegret and Thomas, 2009).

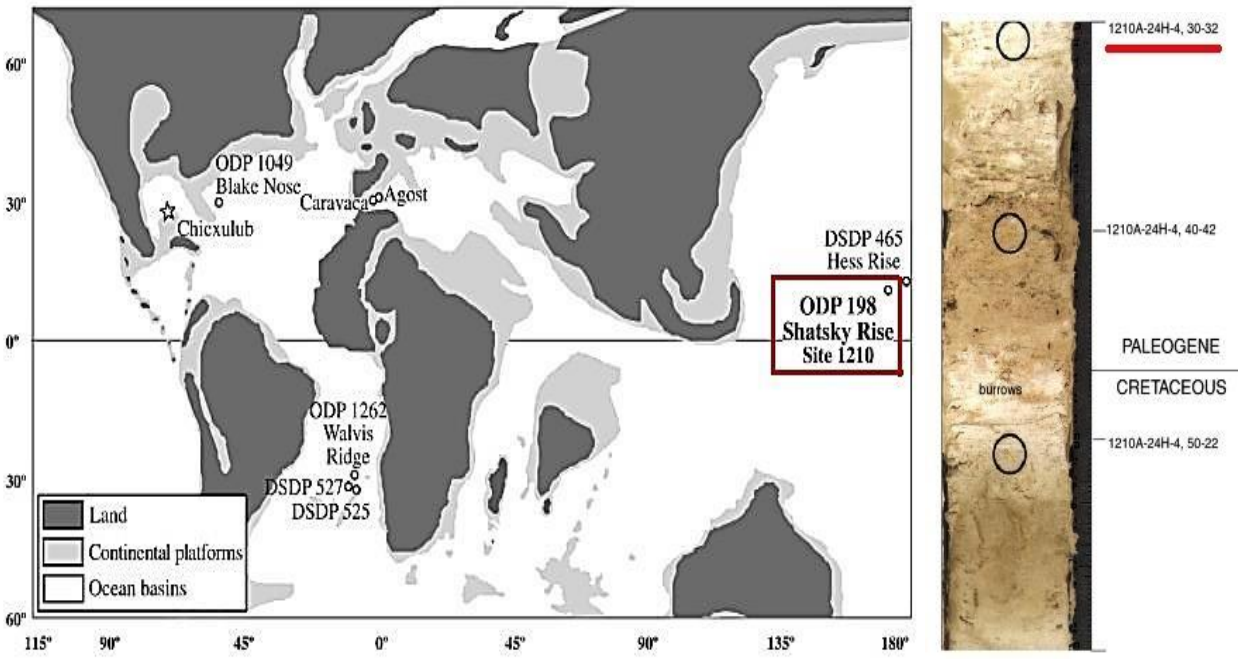

Figure 1: Location and stratigraphic level of the new genus *Bolivinoidesella*, Pacific Ocean (after Alegret & Thomas, 2009).

The present study aims at throwing light on modern paleontological consideration of the Paleocene genus *Bolivinoidesella* from the Pacific Ocean, to detect its paleoenvironments, and to study the holotypes of the described other three related Rotaliid genera of the Superfamily Bolivinacea Glaessner (1937): *Bolivina* d'Orbigny (1839), *Latibolivina* Srinivasan (1966) and *Bolivinoides* Cushman (1927) (Table 1).

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Table 1: The morphocharacters of four Bolivinid genera: *Bolivina*, *Latibolivina, Bolivinoides* and the new genus *Bolivinoidesella*.

Character / Genus	arrangement of chambers	ornamentation	sutures	test shape	aperture shape, position
Bolivina	biserial	ornamented with irregularly anastomosing costae or smooth	slightly depressde	elongate to rhomboide	narrow loop basal
Latibolivina	biserial	ornamented with heavy sculpture of anastomosing longitudinal costae	obscured by surface ornamentation	elongate	narrow loop basal
Bolivinoides	biserial	ornamented with thick longitudinal costae that may bifurcate distally	commonly obscured by ornamentation	rhomboidal	narrow opening basal
Bolivinoidesella	biserial	ornamented with wrinkled surface without costae	obscured lower part depressed upper part	elongate	narrow opening basal

2. Faunal Discussion

The *Bolivinoidesella* n. gen. is compared with other three related Bolivinid genera: *Bolivina, Latibolivina* and *Bolivinoides* (Table 1), which has a diagnostic characters of its large elongate test with biserial arrangement chambers and wrinkled rugose ornamented surface.

3. Taxonomy

The taxonomic classification of Loeblich and Tappan of the new genus *Bolivinoidesella* as well as the other recorded three genera of the Rotaliid benthic foraminifera is followed (Loeblich and Tappan, 1988). The illustrated taxa have been shown in Plate (1).

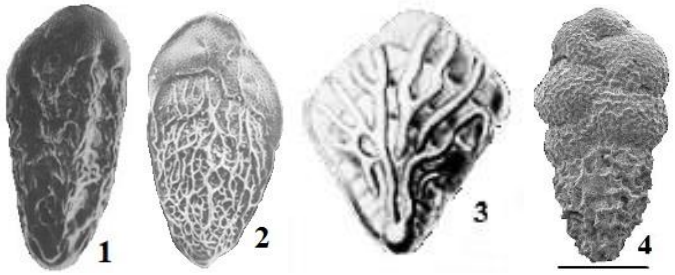

Plate 1: Figure 1. 1. *Bolivina* d'Orbigny (1839), 2. *Latibolivina* Srinivasan (1966), 3. *Bolivinoides* Cushman (1927), 4. *Bolivinoidesella* Anan, n. gen

Superfamily Bolivinacea Glaessner, 1937

Family Bolivinidae Glaessner, 1937

Bolivina d'Orbigny (1839**),** Plate 1, Figure 1.

Latibolivina Srinivasan (1966**),** Plate 1, Figure 2.

Family Bolivinoididae Loeblich & Tappan, 1984

Bolivinoides Cushman (1927), Plate 1, Figure 3.

Bolivinoidesella pacifica Anan, n. gen. n. sp.

Holotype: Plate 1, Figure 4.

Etymology: after the location Pacific Ocean of the new genus and species.

Stratigraphic level: Paleocene, sample ODP 198-drilled on the Southern High of Shatsky Rise, Site 1210A- 24H-4(30–32), 219.70, Pacific Ocean (Figure 2).

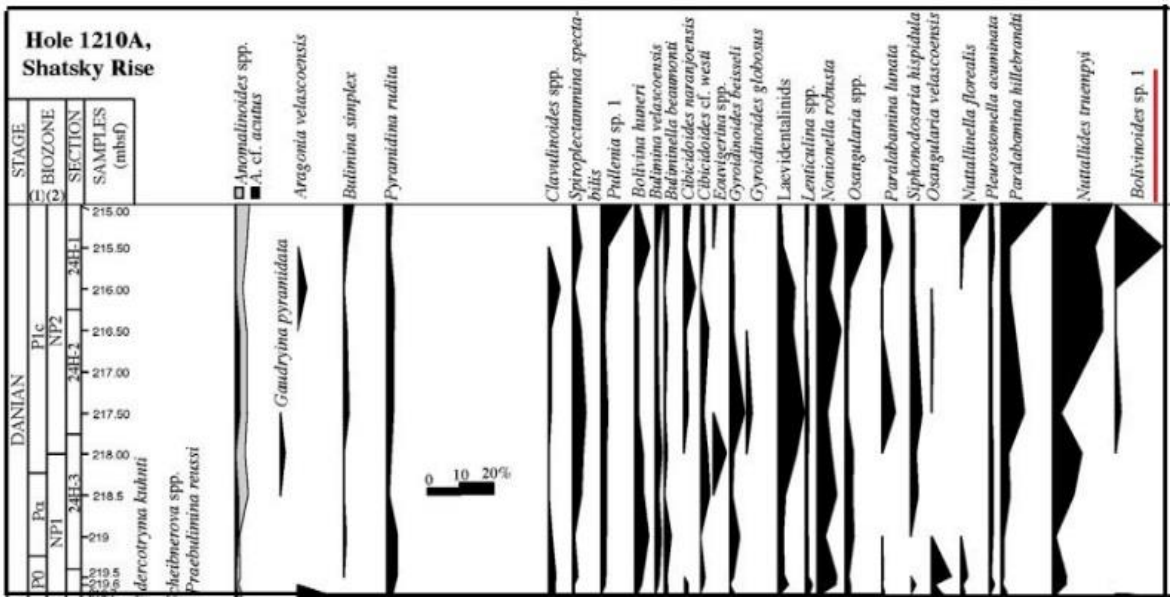

Figure 2: Stratigraphic range of the new genus *Bolivinoidesella* (=*Bolivinoides* sp. 1).

Diagnosis: It is characterized by its finely perforate calcareous wall with elongate large biserial test, chambers nearly globular increasing rapidly as added, surface ornamented with wrinkles not irregularly anastomosing costae, periphery broadly rounded, sutures obscured in the lower part of the test, but slightly depressed in the upper part, narrow opening basal aperture.

Remarks: This new genus and species has been previously assigned to the genus *Bolivinoides*, but it differs by its elongate test, wrinkled ornamented surface and anastomosing costae than rhomboidal test with longitudinal costae may bifurcated distally. *Bolivinoidesella pacifica* also differs from *Bolivina huneri* Howe by elongate test with nearly parallel periphery than rhomboid outline test.

4. PALEOENVIRONMENT

Alegret and Thomas noted that the food supply to the deep sea in the Pacific Ocean thus apparently increased rather than decreased in the earliest Danian (Alegret and Thomas, 2009). The low benthic diversity during a time of high food supply indicates a stressed environment, and the global deep-sea floor became severely food-depleted following the K/Pg extinction due to the mass extinction of primary producers (Figure 3). The Paleocene new genus *Bolivinoidesella* represent the lower bathyal–upper abyssal (1500–2000 m).

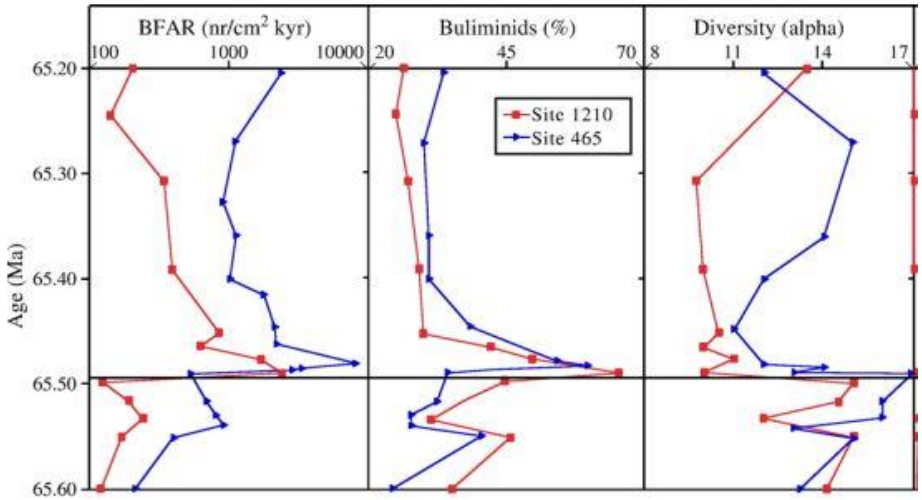

Figure 3: Benthic foraminiferal accumulation rates (BFAR), percentages of Buliminid taxa, Fisher-α diversity index, across the K/Pg transition at Sites 1210 (Shatsky Rise) and 465 (Hess Rise), for the locations of the two rises, see Figure 1 (Alegret and Thomas, 2009).

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