

GASTROPOD MOLLUSKS FROM THE BRIGHTSEAT FORMATION (PALEOCENE: DANIAN) OF MARYLAND

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ABSTRACT

The Brightseat Formation, exposed near the inner margin of the Salisbury Embayment in Maryland and Virginia, represents the earliest Paleocene sediments that crop out in this region of the northern Atlantic Coastal Plain. The formation is placed within the middle part of the Danian Stage, as defined by the presence of the *Chiasmolithus danicus* calcareous nannofossil Zone (NP3). Although a number of studies have investigated the microfauna of the Brightseat, no similarly thorough evaluation has been afforded to the macrofauna. This study provides the first extensive taxonomic treatment of the gastropods, collected largely from now-inaccessible Brightseat localities near the original type section in the lower Potomac River Valley, east of Washington, D. C.

The diverse gastropod fauna of the Brightseat Formation consists of 52 species or forms assigned to 41 genera distributed among 25 families. Twenty-five species or subspecies are described as new: *Kapalmerella mortoni protomortoni* n. ssp., “*Turritella*” *prehumerosa* n. sp., *Sigmesalia palm-eræ* n. sp., *Sigmesalia?* *gnoma* n. sp., *Neverita* (*Neverita*) *potomacensis* n. sp., *Pseudocirsope feorra* n. sp., *Pasitheola marylandensis* n. sp., *Anticlimax?* *gardneræ* n. sp., *Cyclostremiscus sobli* n. sp., *Solariorbis laurelæ* n. sp., *Vitrinella* (*Vitrinellops*) *clarkmartinorum* n. sp., *Eulima brightseatensis* n. sp., *Calyptrea aldrichi* n. sp., *Lacina pygmaea* n. sp., *Siphonalia potomacensis* n. sp., *Pseudolina longicostata* n. sp., *Acrocoelum richardsi* n. sp., *Mathilda* (*Fimbriatella*) *crebricosta* n. sp., *Mathilda* (*F*) *marylandensis* n. sp., *Mathilda* (*Mathilda*) *kauffmani* n. sp., *Acteon danicus* n. sp., *Zikkuratia danica* n. sp., *Scaphander* (*Priscaphander*) *potomacensis* n. sp., *Creonella obscuriplica* n. sp., and *Puposyrnola toulmini* n. sp. The author of all these new species is Govoni.

The Brightseat gastropods include a mixture of genera indicative of both northern mild-temperate and southern warm-temperate affinities, and we compare the assemblage to faunas of similar age from elsewhere in the Coastal Plain of North America, from West Greenland, and from northwestern Europe. In overall composition, the Brightseat fauna more strongly resembles the Danian to Selandian shelf faunas of the north-central and western margins of the North Atlantic Basin (West Greenland, Denmark, and Belgium), within the Danian Northern Mild-Temperate (NMT) Marine Zoogeographic Province, than it does contemporaneous faunas to the southwest in the Gulf Coastal Plain (in Texas, Mississippi, and Alabama), on the northern margin of the Southern Warm-Temperate (SWT) Province. This mixture of elements of differing biogeographic affinities suggests that the Brightseat gastropods flourished on a portion of the eastern North American continental shelf situated within a zone of overlapping northern and southern influence that marked the boundary between the two Danian North Atlantic marine zoogeographic provinces.

INTRODUCTION

The Brightseat Formation is a lower Paleocene (middle Danian) marine deposit lying between the Upper Cretaceous Severn Formation and the upper Paleocene Aquia Formation in the lower Potomac River Valley near Washington, D. C. (Bennett and Collins, 1952). Although the microfossils of the Brightseat are well known (Berggren, 1965a,b; Hazel, 1968; Loeblich and Tappan, 1957a,b; Self-Trail et al., 2022, 2023a,b), very few published studies have appeared on either the composition or significance of the diverse and relatively well-

preserved molluscan macrofauna, which constitutes the richest lower Paleocene assemblage of its kind preserved in the Atlantic Coastal Plain. Previous studies that have focused on the mollusks (e.g., Kauffman and Beauchamp, 1969; Bretsky, 1974; Bretsky and Kauffmann, 1977) have been concerned primarily with Bivalvia. To date, no attempt has been made to describe systematically either the bivalve or the gastropod fauna, or to explore their potential value in biostratigraphic or biogeographic analysis, yet the Brightseat Formation occupies a key geographic and stratigraphic position for transatlantic correlation and comparison. The Brightseat fauna is the most northern and eastern lower Paleocene assemblage in North

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