

OLDEST SCLERACTINIAN FAUNA FROM JAMAICA (HAUTERIVIAN, BENBOW INLIER)

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ABSTRACT—From the oldest Cretaceous marine sediments of Jamaica, the Copper Limestone within the Devils Racecourse Formation (Benbow Inlier, Clarendon Block), the oldest known coral fauna of the Caribbean is described. The small but diverse fauna encompasses 18 species in 17 genera of the suborders Amphipora, Archeoceniina, Heteroceniina, Faviina, Fungiina, Microsolenia, and Stylinina. The fauna contains the first representatives of the suborder Amphipora in the Caribbean and the Americas. One genus of the family Amphiporidae, *Monoaulastrea*, and three species—*Monoaulastrea rawi*, *Latusastrea rubrolineata*, *Camptodocis corralesii*—are described as new. The preoccupied coral genus *Floria* is replaced by the new name *Floriastrea*. The new fauna shows relationships to faunas from the late Berriasian to late Albian. Most species are shared with the Hauterivian faunas from Georgia in the central Tethys and the Paris Basin in the Boreal, but also with younger faunas such as the Barremian of Central Mexico, the early Aptian of Greece and the early Albian of the Bisbee Basin (Northern Mexico).

INTRODUCTION

THE LATE Jurassic to very Early Cretaceous was marked by extensive formation of coral reefs globally, with a very distinct composition of amphiporids, faviids, rhipidogyrids, and stylinids (Eliášová, 1981; Kolodziej, 2003; Kuzmicheva, 2002; Löser and Mori, 2002). Presumably with the fall in global sea level that started during the late Berriasian and the sudden decrease of the Mg^{2+}/Ca^{2+} proportion in marine waters (Stanley and Hardie, 1998), this reef formation terminated, accompanied by the extinction of various genera (about 90; Sepkoski, 2002; Löser, 2005) of the above mentioned suborders. The remarkable sea level rise at the beginning of the Hauterivian coincided with the beginning of a faunal explosion of Cretaceous corals (Löser, 2005). Numerous new genera and species appear at this time (about 40 during the Hauterivian; Sepkoski, 2002; Löser, 2005), though the fauna is concentrated in certain areas (Götz et al., 2005). The increase in taxonomic richness persisted during the Barremian and Aptian until anoxic event 1b in the earliest Albian (Erba, 2004). Coral-rich outcrops are far more common from the Barremian onward (Löser, 1998). Most Cretaceous coral localities, including numerous species-rich outcrops, date from the Barremian and Aptian and therefore global taxonomic richness is highest for this part of the Early Cretaceous (Löser, 1998). This is only partly true for faunas of the Caribbean and the Americas, where coral faunas older than Aptian are rare. There are two small Hauterivian to Barremian faunas from Chile (Prinz, 1991), various small Hauterivian faunas from Mexico (Durango and Coahuila; Wells, 1946), a single record from the Hauterivian to Barremian of Peru (Scott and Alemán, 1984), and one late Berriasian to Valanginian outcrop in Texas (USA; Scott, 1984). The only known large Barremian fauna from the western hemisphere is reported from Puebla (Mexico, 42 species; Löser, 2006).

Rudist bivalves are well known from the oldest Early Cretaceous marine sediments of the Benbow Inlier, Jamaica (Copper and Benbow limestones, Devils Racecourse Formation, Seafield Limestone; Chubb, 1968, 1971; Skelton and Masse, 1998), but records of corals are very sparse in the literature. Although the Benbow Inlier was investigated in the 1960s by the Geological Survey of Jamaica (Burke et al., 1969), corals were not reported. Coates (1977) did not list records for any corals from the limestones of the Devils Racecourse Formation, and only a single record, *Elasmophyllia*, from the Albian Seafield Limestone. Thus, Coates' (1973, p. 171) summary diagram for Tethyan coral endemicity lacks any pre-Albian data for the Caribbean Region.

Kauffman et al. (1989) is the only record of pre-Albian corals; specifically, *Microsolenia* sp. and ?*Microsolenia* sp. from the Jubilee (=Copper) Limestone.

The newly discovered fauna from Jamaica is therefore almost isolated. Moreover, the Benbow Inlier of central Jamaica contains the only pre-Albian limestone sequences on the Caribbean Plate. It therefore provides a unique insight into the paleogeographical distribution of organisms during the Early Cretaceous.

GEOLOGICAL SETTING

The oldest rocks exposed in Jamaica are found in the Benbow Inlier on the northeastern part of the Clarendon Block (Figure 1). The stratigraphy of the inlier was worked out by Matley and Raw (1942), Chubb (1960), and Burke et al. (1969). The oldest rocks in the inlier were called the Devils Racecourse Formation by Burke et al. (1969). They consist of lavas and associated volcanics, and four limestone members have previously been recognized. Recent mapping by SM and Ian Brown (University of the West Indies) suggests that the large number of limestones in the lower part of the Devils Racecourse Formation is due, at least in part, to duplication by faulting. Currently two major limestone units are recognized: a lower unit (variously called the Copper, Jubilee, Bonnet, or Phillisburg Limestone) and an upper unit (Benbow Limestone). We studied sections in the Copper Limestone exposed on the road between Linstead and Guys Hill (Figure 1). In order to understand the age of the coral assemblage from the Copper Limestone it is necessary to consider biostratigraphic data from the Copper and Benbow limestones in the Devils Racecourse Formation.

The Benbow Limestone (sensu Matley and Raw, 1942) is the thickest limestone within the Devils Racecourse Formation of the Benbow Inlier. The limestone is dominated by biomicrites and is about 400 m thick. Macrofossils include rudist bivalves, chondrodonts, gastropods, and corals. Stromatolites are present. The rudist bivalves include *Retha tulae* (Felix, 1891) in the lower part and *Amphitriscoelus primaevus* Pantoja-Alor et al., 2004 in the upper part, suggesting lower and upper Barremian, respectively. The Benbow Limestone also contains the gastropods *Diozoptyxis renauxiana* (d'Orbigny, 1842), *D. cf. coquandiana* (d'Orbigny, 1842), *Nerinea galatea* Coquand, 1865, and *Archimedeia gigantea* (d'Hombre-Firmas, 1838), which indicate a late Barremian to early Aptian age (Sohl in Khudoley and Meyerhoff, 1971, p. 113; Sohl, 1978). Foraminifers from the Benbow Limestone include *Chofatella decipiens* Schlumberger, 1905, *Neotrocholina friburgensis* (Guillaume and Reichel, 1957), *Citaella* sp., *Cuneolina*