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Two very fossiliferous rudist sites from the Marchmont Inlier, northwestern Jamaica

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ABSTRACT. The Marchmont Inlier of north-western Jamaica exposes Upper Cretaceous rudist-bearing limestones and intervening clastics. The purpose of this note is to document the presence of two localities in this inlier that yield abundant, well-preserved rudist specimens belonging to the *Titanosarcolites* fauna. Collections from these sites have significantly increased our knowledge of the rudist assemblages present within the inlier, and may prove invaluable in future studies on the biostratigraphy and palaeoecology of Jamaican rudists.

INTRODUCTION

The Marchmont Inlier of Jamaica lies on the western edge of the Clarendon Block and consists of a series of rudist-bearing limestones and intervening siliciclastic units (Robinson, 1994). Chubb (1960) and Meyerhoff and Krieg (1977) published accounts of the geology of the Marchmont Inlier. Aspects of the biostratigraphy of the inlier have been described by Trechmann (1924) and Hazel and Kamiya (1993), amongst others. The limestones yield abundant rudists, including *Titanosarcolites giganteus* (Whitfield), *Biradiolites jamaicensis* Trechmann, *Chiapasella* sp., *Antillocaprina* spp., *Thyrastylon* spp., *Bournonia* spp. and *Plagioptychus* spp. These are typical of the *Titanosarcolites* fauna, which was considered to be Maastrichtian in age by Chubb (1971). No definitive nomenclature exists for the lithostratigraphic units within this inlier. The sedimentology and biostratigraphy of the Marchmont Inlier has been the subject of recent study by the author, in conjunction with detailed mapping (Gunter, 2000).

The importance of properly documenting significant localities is often under-appreciated. There have been many instances of important localities either being lost or rediscovered with great difficulty due to poor documentation. Documenting these sites allows their collections to be placed in a stratigraphic framework, even though this may be reviewed as the geology of the area is revised. It also facilitates workers who may wish to make new collections from these exposures. The sites discussed below were discovered while conducting investigations in the inlier during the summer of 2000. These sites are particularly noteworthy because of their accessibility and the large number of well-preserved specimens that may be collected from them. The rudist collections obtained from these two sites have been deposited in the University of the West Indies Geology Museum (UWIGM) as part of the author's research collection.

BRUCE HALL-GREAT RIVER RUDIST LOCALITY

This site is located west of Bruce Hall along the eastern bank of the Great River (Fig. 1), which there constitutes the border between the parishes of Westmoreland and St James. The exposure yielding the rudists is located by a bend in the river beneath a well-indurated limestone bed. Flood currents have scoured out the less indurated, fossiliferous, impure limestone beds, rendering a roof-like structure to the well-indurated beds (Fig. 2). Eddy currents in the river have produced an adjoining pool at the site. The very dense rudist-coral fabric contains fossils preserved in life position or slightly jumbled. Specimens can be removed from the grey, impure limestone with relative ease and many fossils can be found loose on the surface of the exposure. The site may be reached via an unpaved dead-end road leading west at Bruce Hall from the Cambridge-Retrieve main road. From the end of the road, the remaining distance is covered via a trail that leads to the banks of the Great River. A list of fossils documented from this site is given in Table 1. Tables 1 and 2 are abridged, and do not contain the museum numbers of all the representatives of the listed taxa. The full list may be requested from the museum curator. The rudist nomenclature of Chubb (1971), with the exception of *Hippurites maldonensis* (Chubb), has been adopted for this paper, aspects of which may be subject to future review.

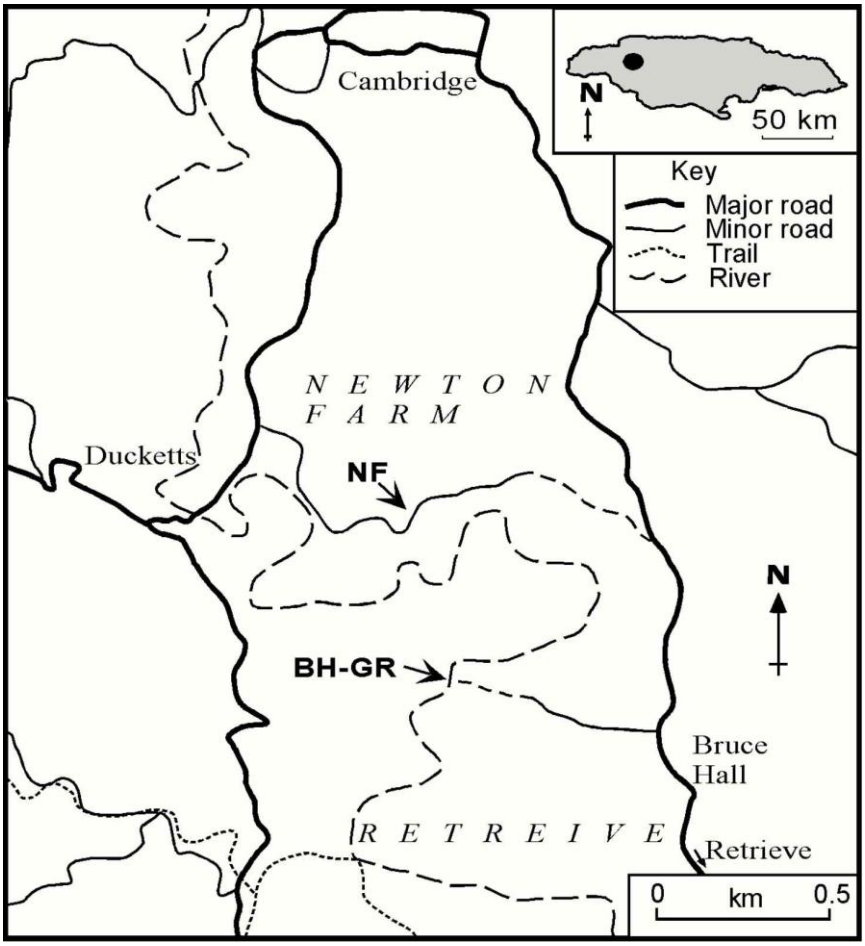


Figure 1. Simplified map showing the location of the Newton Farm and Bruce Hall-Great River localities (indicated by NF and BH-GR, respectively). Inset map of Jamaica shows the approximate position of the Marchmont Inlier (indicated by a black dot).

NEWTON FARM RUDIST LOCALITY

This site (Figs 1, 3) is located on a slope alongside an unpaved road leading east from the Cambridge-Ducketts main road through the Newton Farm property. This road originally would have joined to the Cambridge-Retrieve main road to the east, but its easternmost section is now in a state of disrepair and is presently impassable to vehicles. Numerous well-preserved fossils occur loose on the slope, where they have weathered out from the surface of the limestone. The slope is being cultivated and many of the fossils have been gathered into 'rock piles' to facilitate this. Rudists dominate the assemblage, but corals are also present. The abundance of fossils and their good preservation suggests that they may represent a local life assemblage, which has been subject to little post-mortem transport. Similarly to the previous locality, the source of these fossils is likely to be a group of poorly indurated and impure fossiliferous limestone beds. Such beds are exposed along the length of the road adjoining the slope. As numerous examples of individual rudist taxa may be collected from this locality, the collections may facilitate assessments of the variation within individual species. Particularly abundant are disarticulated valves of *Antillocaprina* spp. and *Titanosarcolites* spp. A list of fossils documented from the site is given in Table 2.

SIGNIFICANCE OF THE SITES AND SPECIMENS COLLECTED

Bruce Hall-Great River locality

This site is exceptional in both the preservation of the rudists that occur there, and the fact that many of the rudists and corals are preserved in life position. It thus offers an excellent opportunity to study the palaeoecology of a rudist-coral dominated environment. One can clearly glean the simple

Figure 2. Photograph of the Bruce Hall-Great River locality showing the rudist-coral dominated impure limestone.

Figure 3. View of the main collecting area along a slope where rudist limestone beds crop out on the Newton Farm property.

Table 1. Bruce Hall-Great River assemblage

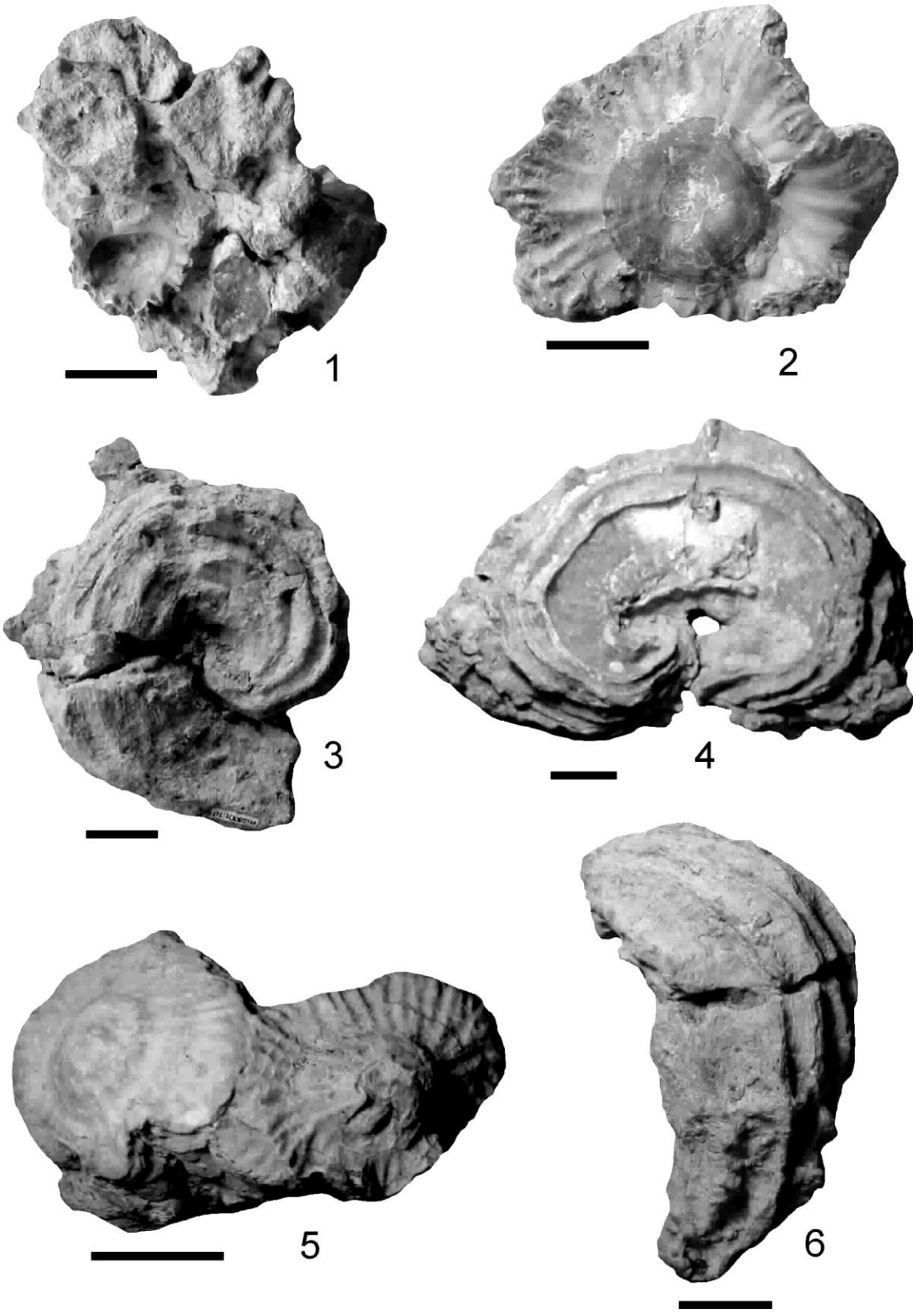
Group	Species	Museum numbers
Rudists	*Antillocaprina quadrangularis* (Whitfield)	RG2001.39.MM15
	Antillocaprina stellata Chubb	RG2001.40.MM15
	Bournonia barretti Trechmann	RG2001.30.MM15
	Bournonia cancellata (Whitfield)	RG2001.31.MM15
	Bournonia thiadensi Vermunt	RG2001.32.MM15
	Biradiolites rudissimus Trechmann	RG2001.109.MM15
	Chiapasella sp.	RG2001.158.MM15
	Plagioptychus fragilis Chubb	RG2001.48a.MM15
	Thyrastylon adhaerens (Whitfield)	RG2001.43.MM15
	Titanosarcolites alatus Chubb	RG2001.2.MM15
	Titanosarcolites giganteus (Whitfield)	Observed
	Hippurites mullerriedi (Vermunt)	Observed
	Gen. et sp. nov. (small attached rudist)	RG2001.128a.MM15
Echinoid	*Goniopygus supremus* Hawkins (tests and radioles)	RG2001.53.MM15
Crustaceans	Crab claw fragment.	RG2001.55.MM15
	Ostracodes	
Corals	*Dicocoenia* sp.	Observed
	Leptoria sp.	RG2001.47a.MM15

Table 2. Newton Farm locality assemblage

Group	Species	Museum numbers
Rudists	*Antillocaprina* sp.	RG2001.1.MM16
	Antillocaprina quadrangularis (Whitfield)	RG2001.108.MM16
	Antillocaprina suboccidentalis (Chubb)	RG2001.6.MM16
	Bournonia sp.	RG2001.7.MM16
	Bournonia cancellata (Whitfield)	RG2001.62.MM16
	Plagioptychus fragilis Chubb	RG2001.3.MM16
	Thyrastylon adhaerens (Whitfield)	RG2001.8.MM16
	Thyrastylon coryi (Trechmann)	RG2001.14.MM16
	Titanosarcolites alatus (Chubb)	RG2001.12.MM16
	Titanosarcolites giganteus (Whitfield)	Observed
	Hippurites mullerriedi (Vermunt)	RG2001.95.MM16
	Hippurites maldonensis (Chubb)	RG2001.22a.MM16
	Genus undetermined sp. nov.	RG2001.59.MM16
Echinoids	*Goniopygus supremus* Hawkins	Spines observed
	Heterosalenia occidentalis Hawkins	RG2001.57.MM16
Corals	*Dicocoenia* sp.	RG2001.19a.MM16
	Leptoria sp.	RG2001.23a.MM16

observation that corals and rudists thrived together in certain environments. This is in contrast to suggestions made by workers such as Kauffman and Sohl (1974), amongst others. Figure 4.1 illustrates this quite clearly, showing an example of *Bournonia barretti* (Trechmann) preserved in life position and surrounded by several coral heads. Layers dominated by branching corals exist at the site, but through much of the exposure corals such as *Dicocoenia* sp. occur interspersed amongst the

Figure 4 (Facing page). Rudist bivalve specimens from the Marchmont Inlier of Jamaica. 1, *Bournonia barretti* (Trechmann) RV [RG2001.30.MM15], Bruce Hall-Great River locality, preserved in life position and surrounded by coral heads. 2, *Biradiolites rudissimus* Trechmann, articulated, RG2001.109.MM15, Newton Farm. 3, *Antillocaprina occidentalis* (Whitfield), articulated, RG2001.10.MM16, Newton Farm. 4, *Titanosarcolites alatus* Chubb, articulated, RG2001.71.MM16, Newton Farm. 5, *Thyrastylon adhaerens* (Whitfield), articulated, RG2001.8.MM16, Newton Farm. 6, Antillocaprinid rudist ind., articulated, Newton Farm, RG2001.59.MM16, also occurs in the Maldon Inlier, St. James. Individual scale bars represent 2.5 cm on the corresponding specimen.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rudists. A pair of well-preserved *Chiapasella* sp. (RG2001.158.MM15), attached to each other at their bases, has been collected from this site. The larger of the two individuals is articulated (although its free valve has been displaced slightly) and is presently the largest articulated specimen of this species housed in the UWIGM. The individuals were found on their side, suggesting currents toppled them before burial. At least one of the individuals is articulated, suggesting that they were not subjected to extensive transport. An impressive example of an articulated *Biradiolites rudissimus* (Fig. 4.2) was also collected. The specimen clearly shows a radiating and bifurcating pattern of undulations developed on the funnel plates, which is typical of some *Thyrastylon* (see Fig. 4.5). It is thus far the best specimen of this species in our collection and the quality of the specimen exceeds those figured by Chubb (1971).

Newton Farm locality

In general, the specimens that may be gathered from this site are less well-preserved than at Bruce Hall. The site, however, offers an abundance of material, allowing an assessment of the variation that occurs within certain species. This information may prove of vital importance when the taxonomy of certain groups such as the antillocaprinid rudists is reviewed. The site is dominated by *Antillocaprina* spp. and *Titanosarcolites* spp. Numerous free valves of *Antillocaprina* spp. have been collected from the site, including a rare example of an articulated *Antillocaprina occidentalis* (Fig. 4.3). A collection of *Titanosarcolites alatus* was also made, including an articulated specimen of this species (Fig. 4.4). Chubb (1971) figured cross-sections and the aperture of this species, and preliminary observations suggest the external characteristics may be quite variable. Noticeable differences exist between the specimens in the degree of coiling and the number of flanges, but the individuals from this locality are generally flat. In almost all the specimens of *T. alatus* collected from Newton Farm, there is a pronounced 'bundle' on the inside of the coil containing tubules. However, the taxonomic importance of this feature is uncertain. From observations made in this inlier and elsewhere (e.g., Van der Wal, 1978), the species should not be considered 'rare' as stated by Chubb (1971, p.178). The rudist *Hippurites maldonensis* (Chubb) also occurs at this locality, the first report of this species from the Marchmont Inlier. A pair of articulated *Thyrastylon adhaerens* (Whitfield) is shown in Fig. 4.5. Another notable find is an articulated example of a novel species of rudist (Fig. 4.6) which has also been recognised from the Maldon Inlier, St. James. The generic designation of this rudist is uncertain at this time, pending further study of the specimens. So far this is the only articulated specimen of this species within my collection.

In conclusion, both localities contain similar faunal elements with roughly the same number of species (Tables 1, 2). At this time it is unclear whether these two localities belong to the same, or to different, limestone horizons. Until this is established, the full biostratigraphical significance of the faunas within the inlier cannot be assessed.

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