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Part 5

A collection of land Mollusca from limestone in Ulu Kelantan

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INTRODUCTION

Although collections of snails from limestone outcrops in Western Malaya have been numerous and provide us with a fairly comprehensive picture of their distribution, collections from the less accessible parts of the east coast States have been fewer and have yielded only a glimpse of the total distribution pattern. In November 1961 Dr. J. R. Hendrickson (then Professor of Zoology, University of Malaya), made an expedition into Ulu Kelantan and collected land snails from a group of limestone hills around Fort Betis (grid reference: 101.47 E; 4.53 N). He collected live snails from the limestone faces as well as dead shells in the debris around the bases of the hills as described by Tweedie (1961), and kindly handed the material to me.

Collections were made from five hills: Gunong "Senarip", a name given by the inhabitants of the area (hill no. 1); Gunong Renayang (hill no. 2); a small nameless hill not shown on printed maps and thus designated as hill no. 3; Gunong Pasuk (hill no. 4); and Gunong Chenaruk (hill no. 5). These hills are indicated in Figure 1, and their faunas in Table 1. The shells collected from Gua Jaya, to the north of Fort Betis (101.46 E; 5.06 N), are also listed although collection from this site was not so fruitful and snails were not taken alive from the limestone faces.

DISCUSSION

The distribution of many snails on Malayan limestone hills was reviewed by Tweedie (1961). The localities dealt with in his review which lie nearest to Fort Betis are those around Gua Musang, including Gua Madu and Batu Tongkat between Gua Musang and Pulai to the south. Gua Nenek lies about seven miles beyond Gua Musang to the south-west.

The species of *Diplommatina* are largely the same as those of the Gua Musang hills except that *D. tweediei* Laidlaw was not collected but *D. demorgani*, which Tweedie (1961) quotes as limited to Kota Tongkat and Kota Gelanggi in Central Pahang, was. The occurrence of *D. pentaechma* and *D. maduana* at Fort Betis represents a slight extension of their previously known ranges in the Gua Musang hills.

TABLE 1

Snail faunas from limestone hills near Fort Betis, Kelantan

Taxonomic list of snails	Hill number				5	Gua Jaya
	1	2	3	4		
Archaeogastropoda						
Hydrocenidae						
* <i>Hydrocena monterosatlana</i> (Godwin-Austen and Nevill)	+	+	+	+	+	+
Mesogastropoda						
Cyclophoridae						
<i>Cyclophorus perdix tuba</i> (Sowerby)	+			+	+	+
<i>Lagochilus</i> spp.	+		+		+	+
<i>Opisthoporus dautzenbergi</i> Sykes	+		+		+	+
<i>Rhiostoma asiphon</i> v. Moellendorff					+	+
<i>Alycaeus kelantanensis</i> Stoliczka	+	+		+	+	+
<i>Chamalycaeus diplochilus</i> v. Moellendorff	+			+	+	
* <i>Opisthostoma laidlawi</i> Sykes	+	+	+	+	+	+
* <i>Diplommatina canaliculata</i> v. Moellendorff	+	+	+	+	+	+
<i>D. demorgani</i> Laidlaw				+	+	
<i>D. maduana</i> Laidlaw				+	+	
* <i>D. pentaechma</i> Laidlaw	+	+		+		
<i>Pupina lowi</i> de Morgan						+
Pulmonata						
Vertiginidae						
* <i>Gyllotrachela hungerfordiana</i> v. Moellendorff	+	+	+	+		
<i>Parabovsidia frequens</i> v. Benthem Jutting					+	
Subulinidae						
<i>Lamellaxis clavulinus</i> (Potiez & Michaud)		+	+			+
<i>Prosopeas tchehelense</i> (De Morgan)			+		+	
Achatinidae						
<i>Achatina fulica</i> Bowdich	+				+	+
Endodontidae						
<i>Philalanka marangensis</i> (Aldrich)	+	+	+	+	+	+
Helicarionidae						
* <i>Liardetia perakensis</i> (Godwin-Austen)	+	+	+	+	+	+
<i>Hemiplecta cymatium</i> (Pfeiffer)	+			+		+
* <i>Coneuplecta bandongensis</i> (Boettger)	+	+	+	+	+	+
<i>Dyakia salangana</i> (Martens)						
<i>Microcystina</i> sp.	+		+	+	+	+
<i>Macrochlamys</i> sp.					+	+
Pleurodontidae						
<i>Chloritis platytropis</i> v. Moellendorff						+
Streptaxidae						
<i>Sinoennea crumenilla</i> v. Benthem Jutting		+	+			
<i>Discartemon platymorphus</i> v. Benthem Jutting	+					
<i>Discartemon collingei</i> (Sykes)			+		+	+

* Asterick indicates specimens collected alive from mossy rock faces and preserved in 70 per cent alcohol.

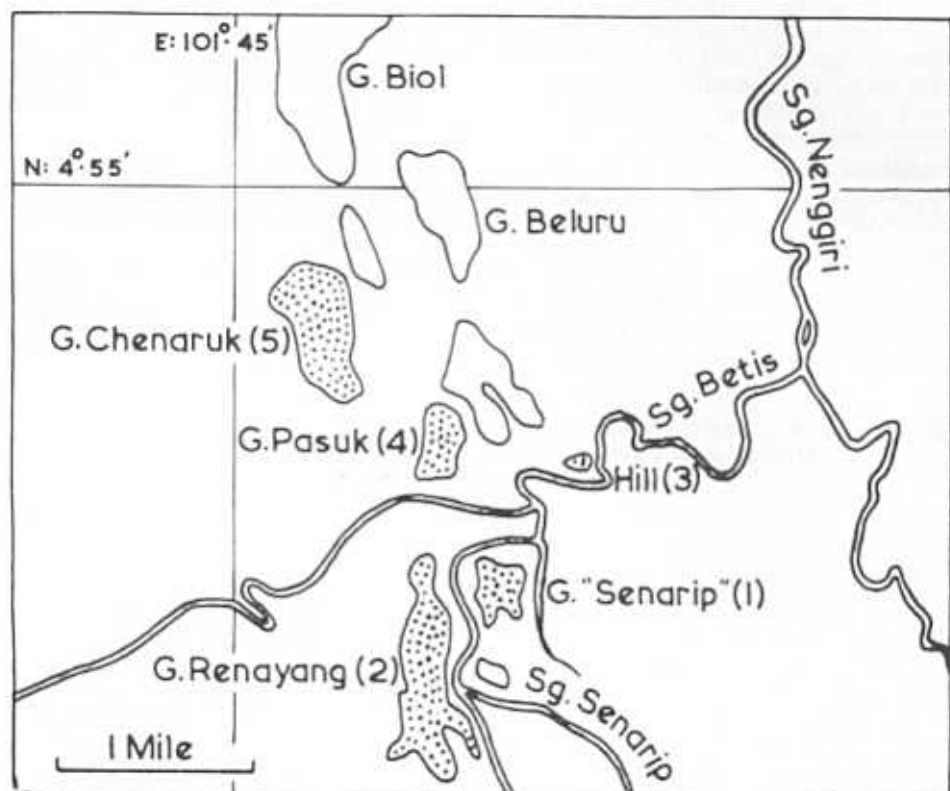


Figure 1. Sketch map of the Fort Betis area, Kelantan, showing the rivers and limestone hills. The hills from which shells were collected are stippled. Grid references are given at top left.

Neither of the two species of *Opisthostoma* recorded from the Gua Musang hills and listed by Tweedie was collected in the present instance. On the other hand, *Opisthostoma laidlawi*, previously recorded as collected from "Kelantan", occurred on all the hills and Dr. Hendrickson was able to collect and preserve several tubes full.

Of the pulmonates typically restricted to limestone, *Paraboysidia frequens* is also known from the Gua Musang hills as well as from localities in Pahang and Selangor. *Gylotrachela hungerfordiana*, although not recorded from the Gua Musang area, is one of the most widespread vertiginids and its occurrence at Fort Betis merely extends its range into Kelantan. The streptaxids in this collection conform with species previously collected in this part of Malaya. *Discartemon collingei* is known from Gua Musang and Gua Nenek in Kelantan and from Gua Sai in Pahang and *D. platymorphus* from Gua Nenek along. Similarly, *Sinoennea crumenilla* was previously known from Gua Nenek.

Most of the rest of the snails are forms which, although known to occur in great numbers only on or near limestone, are not confined to it and have thus been recorded from widely scattered areas in either the east-central region or else the whole of Malaya.

The fauna of the Fort Betis hills therefore appears to be essentially the same as that of the other nearby limestone hills with certain exceptions and extends the known range of many species. Further collections may reveal that this whole area of Ulu Kelantan shares a common molluscan fauna. On the other hand previous work has produced new species in many newly explored localities rather than merely extending the ranges of already described species. Much remains to be explained about the degree and nature of the isolation of these limestone hills in various parts of Malaya and about the biological nature of the differences between closely related species of snails on separate hills which have so far been established only on the basis of shell characters.

I am grateful to Dr. J. R. Hendrickson for providing this interesting material and also to Mrs. W. S. S. van der Feen van Benthem Jutting of the Zoologisch Museum, Amsterdam, who kindly confirmed the indentifications of several of the shells.

REFERENCE

- TWEEDIE, M. W. F., 1961. On certain Mollusca of the Malayan limestone hills. *Bull. Raffles Mus. Singapore*, 26: 49-65, fig. 1, pls. 15 & 16.

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