

Records of Bandicoot Rats (*Bandicota*, Rodentia, Muridae) new to the fauna of Malaya and Thailand

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THE PRESENCE of *Bandicota bengalensis* (Gray and Hardwicke) (*Gunomys bengalensis* of Chasen's 1940 checklist) has been known in Malaya for a half a century. Specimens collected by Cantor and Flower from Penang were described by Thomas (1907) as *Gunomys varius* and *G. varillus*. A further collection from Penang was made by Tweedie in 1935 and examined by Chasen (1936) who considered that *varius* and *varillus* were synonymous, and that the race was but little differentiated from *bengalensis*.

The locality has remained a curiously isolated one. The species is known from India eastwards to Burma, and from Java and Sumatra. Ellerman and Morrison-Scott (1951: 617) record *B.b. varius* from Penang and add "Range: northwards to Tenasserim and Lower Burma", while Ellerman (1947: 366) records that the British Museum collection contained specimens of *varius* from "Mergui, Tenasserim, 12 mi SE Pegu, Prome, and Toungoo in Burma". No specimens are, however, known to me from the mainland of the Malay Peninsula on the 500 mile stretch from Penang Island to Tenasserim, although the species was recorded from Kedah by myself (Harrison 1949: 99) on the basis of a mistake described below. The species is not recorded from any part of Thailand (Chote Suvatti 1950).

Bandicoots from Kedah and Perlis. In 1947 large rats were reported attacking rice-fields in Kedah and Perlis. They were obviously bandicoots, and it was assumed that they must represent the mainland form of *Bandicota bengalensis varius*, hitherto only recorded from Penang Island. The then Acting Director of Museums, Mr. H. T. Pagden, arranged for a series of specimens to be collected and deposited in the Selangor Museum. I saw a few of these specimens at the time and noted that they were large, but since *varius* is a characteristically large race with which I was not familiar I paid no further attention to them. Since then the small remaining collection of mammals in the Selangor Museum (which was largely destroyed by bombing during the war) has been deposited in this laboratory, and I took the opportunity of re-examining the specimens in connexion with the identification of the collection from Thailand noted below.

I was surprised to find that the specimens from Kedah and Perlis were not *B. bengalensis*, as had been supposed, but *Bandicota indica* (Bechstein, 1800) a species hitherto unrecorded from Malaya. The collection consists of 12 males and 7 females labelled "Perlis" and four males labelled "Kedah, Telok Changel" (? = Telok Changai near Alor Star).

Bandicoots from Thailand. In 1952 a collection of Trombiculid mites was made in the neighbourhood of Bangkok by Mr. R. Elbel in collaboration with Dr. Mali Thaineua and Dr. Boonsong Lekagul¹. These were collected from a variety of small mammals which were measured and provisionally identified. Series of skins of these

¹. This collection was made during the course of plague surveys carried out by members of the U.S. Special Technical and Economic Mission to Thailand, as described by Traub *et al* (1954).

species were kept for determination, and I had the opportunity of examining some of these. The bandicoots could clearly be divided into two species, which I take to be *Bandicota indica* and *B. bengalensis*, although *bengalensis* has not, hitherto been recorded from Thailand.

Specimens of *B. bengalensis* were recorded from near Rajburi, near Ban Pong, and from Borphloy and Lodya near Kanchana Buri, all localities within about 100 miles to the west of Bangkok.

Tabulated Measurements. Table 1 summarises the collectors' measurements of these two collections compared with the measurements of a long series of *B. bengalensis* from Rangoon given by Harrison & Woodville (1951) and five specimens of *B.b. varius* from Penang given by Chasen (1936). The Rangoon figures are given as percentages in each size group, the others are actual numbers. The body size of the two species is very much the same. Some of the Bangkok specimens appear to have rather short bodies, and therefore longer tails in proportion. It is likely, however, that these were measured without a thorough straightening of the body first. The length of the hindfoot appears to offer a reasonably distinctive character.

Table 2 compares measurements of the skulls of the five specimens from Penang (as given by Chasen 1936), two specimens of *B. bengalensis* from Sumatra (as given by Sody 1941), four of the specimens from near Bangkok (two of each species, which are at present in this laboratory), a specimen of *B. indica* kindly sent to me from Hong Kong by Mr. J. Romer, C.M.Z.S., and six of the bandicoots from Kedah and Perlis.

TABLE 1

Frequency distribution of collector's measurements of *B. bengalensis* and *B. indica*, showing actual number of specimens in each group, except for Rangoon where percentages of the 409 specimens are given.

	<i>B. bengalensis</i>			<i>B. indica</i>	
	Rangoon	Penang	Bangkok	Kedah	Bangkok
Head & Body, in mm., by 25 mm. groups:					
under 150 mm.	.. .. 8	..	..	..	..
150-174 mm.	.. .. 7	..	9	..	..
175- .. ..	.. .. 22	..	11	..	..
200- .. ..	.. .. 38	4	..	12	2
225- .. ..	.. .. 23	1	..	5	3
250- .. ..	.. .. 2	..	..	2	1
275- & over	.. ..	..	..	1	..
Tail as % of H & B by 10% groups:					
under 70%	.. .. 1	..	1	..	..
70-79%	.. .. 29	3	0	1	..
80- .. ..	.. .. 58	2	12	5	2
90- .. ..	.. .. 12	..	4	11	4
100- .. ..	.. ..	..	2	3	..
110 & over	.. ..	..	1	..	..
Hindfoot, without claws, in mm., by 4 mm. groups:					
under 32 mm.	.. .. 6	..	4	..	..
32-35 mm.	.. .. 22	3	13	..	..
36- .. ..	.. .. 57	3	3	..	..
40- .. ..	.. .. 14	..	..	3	..
44- .. ..	.. .. 1	..	..	13	..
48- .. ..	.. ..	..	..	2	4
52 & over	.. ..	..	..	2	2

TABLE 2

Measurements of skulls of sample specimens of *B. bengalensis* and *B. indica*

Locality	Sex	Skull measurements in mm.								Measurements as percentages of the Greatest Lengths		
		Greatest length	Basal Length	Zygomatic Breadth	Diastreme	Palatal foramen	Upper Molar Row	Length of Nasal Bones	Palatal Length	Length of Bulla	Nasals	Palate	Bulla
<i>Bandicota bengalensis</i>												
Penang ..	4♂♂	46	43.1	25.1	14.5	8.1	7.9	—	—	—	—	—
(Chasen 1936)		48.5	45.9	27	15.3	9	8.5	—	—	—	—	—
	♀	47.7	45	27.2	15.1	8.7	8.2	—	—	—	—	—
Sumatra ..	♂	40.0	37.3	—	11.7	9.0	8.2	12.2	23.6	—	30.5	59
(Sody 1941)	♀	35.1	32.7	21.1	10.3	6.0	8.0	10.5	20.7	—	30	59
Bangkok ..	♂	46	43	25.1	13.8	8.7	8.4	14.9	26.4	9.1	32	57
	♀	43	39	23.2	12.6	7.6	7.8	14.1	24.5	8.3	33	57
<i>Bandicota indica</i>												
Hong Kong ..	♂	50	47	26.7	15.3	9.0	9.7	17.1	29.6	10.2	34	59
Bangkok ..	♂	54	51	30.1	16.3	9.1	10.8	18.8	32.3	9.1	35	60
	♂	53	50	29.8	16.2	9.5	10.9	18.2	31.5	9.3	34	59.5
Kedah ..	♂	48	45	26.5	14.6	8.5	10.4	16.7	28.7	9.6	35	60
	♂	58	55	32.2	18.1	10.8	11.0	21.9	33.8	10.6	37.5	58
	♀	51	48	27.6	15.9	8.5	10.4	18.5	30.2	9.6	36.5	59
	♀	49	45	26.9	14.4	8.8	10.5	17.2	28.8	9.7	35	59
Perlis ..	♂	54	51	29.8	16.9	10.0	10.5	20.6	32.2	10.3	38	59.5
	♂	58	54	31.7	17.4	9.8	11.3	21.2	34.6	9.6	37.5	59

In a key to the Indian rodents, Ellerman (1947) distinguishes *bengalensis* from *indica* as follows:—

"Bullae smaller, usually less than one fifth of the occipitonasal length; nasals more than one third of the occipitonasal length, as a rule; length of palate usually less than 60 per cent of occipitonasal length; occipitonasal length varies between 46 mm. and 68 mm.; braincase as a rule proportionately narrower *Bandicota indica*

"Bullae larger, normally exceeding one-fifth of occipitonasal length; nasals as a rule less than one-third of occipitonasal length; length of palate normally more than 60 per cent of occipitonasal length; occipitonasal length varies between 35 to 49 mm. braincase usually proportionately wider

Bandicota bengalensis".

In table 2, I have given the greatest length of the skulls, to conform with the measurements given by Chasen and by Sody, and the lengths of the bullae, nasals, and palate, have been expressed as percentages of this. Since the greatest length averages about 2 per cent longer than the occipitonasal length these percentages will need to be increased slightly (by one unit or less) to compare with Ellerman's key proportions. In this series the proportionate lengths of the palate and of the bulla do not appear to provide very good diagnostic characters, although their average absolute lengths are clearly different. Both proportionate and absolute length of the nasal bones, and the absolute length of the upper tooth-row seem to be better characters. Sody (1941) does

not give a full series of measurements for *B. indica* from Java, but he gives the tooth-row measurements of 51 specimens as 9.9–12.1 mm. with a mean of 11.22 mm. This agrees with the measurements given here and provides a clear difference.

Discussions. The occurrence of *B. indica* in this corner of Malaya need occasion no surprise. This species, like *bengalensis*, is also found in Java and Sumatra, as well as most of India, Burma, Thailand, Indo China, and South China. Such a distribution, to the north and south of Malaya, but not in most of Malaya itself, is now known for a number of animals, such as reptiles (Malcolm Smith 1930), butterflies (Corbet 1941) and mosquitoes (Reid 1950). Reid discussed the climatic factors involved.

The occurrence of *B. bengalensis* in Thailand is equally to be expected. It is probably a commensal rat, living only in ricefields, and would have been overlooked by collectors who usually avoid trapping commensal species.

What does occasion surprise is the continued absence of *Bandicota bengalensis* from the ricefields of Kedah and Perlis. The fact that bandicoots were not recorded at all until 1947, however, leads one to suspect that a renewed search may yet reveal that species.

Summary

1. The occurrence of *Bandicota indica* (Benchstein, 1800) is recorded for the first time from Malaya, and of *B. bengalensis* (Gray and Hardwicke, 1833) apparently for the first time from Thailand.

2. *B. bengalensis* occurs on the island of Penang, and it has been assumed that bandicoot rats trapped from the mainland in Kedah and Perlis belonged to this species. The closer examination of a collection in the Selangor Museum shows, however that these are *B. indica*.

3. This discovery was made in determining some specimens of bandicoot rats collected near Bangkok as samples of the hosts from which trombiculid mites were being collected. The Thailand collection proved to contain both *B. bengalensis* and *B. indica*.

4. The occurrence of both of these species in the north-west of Malaya and again in Java while being absent from the rest of Malaya, agrees with the distribution noticed for many other animals.

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