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The First Record of Ia io Thomas, 1902 in Vietnam and India, and Some Remarks on the Taxonomic Position of Parascotomanes beaulieui Bourret, 1942, Ia longimana Pen, 1962, and the Genus Ia Thomas, 1902 (Chiroptera: Vespertilionidae)

By

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To Professor Endre Dudich, Ph. D. on His 75th Birthday

The biggest-sized species of the Vespertilionids is *Ia io* THOMAS, 1902, resembling by its dental formula species of the genus *Pipistrellus*. Therefore some students, and principally SIMPSON (6), assign it to the *Pipistrellus* group. Despite its conspicuous size, it is definitely one of the rarer species. Ever since THOMAS' description (8) in 1902, it was collected apparently in Chinese territories only. The known earlier localities are: Changyang (the site of the holotype) in Hupeh north of the Yang-tze, and Wahsien in Szechuan (ALLEN, 1). This latter author mentions one further specimen each from Nanking and Tungwongtien in Kweichow south of the Yang-tze. The same localities appear also in the work of ELLERMAN et MORRISON-SCOTT (3). A. P. KUZYAKIN (letter communication) collected some exemplars in Kunmin, Yunnan, in 1958. PEN et al. (5) described the species *Ia longimana* on the basis of 2 males and 53 females originating from Hueitung in Szechuan. KOWALSKI and LI (4) compared with this latter the *Ia* specimens, provisinally identified as *Hesperopternus* (sic!) *giganteus* by YOUNG (11), deriving from the Pleistocene site No. 1 in Choukutien, and contended that the fossil remains belong specifically to *Ia io*.

I was fortunate enough to collect *Ia io* on two occasions, in 1966 and 1967. The new localities are shown in Fig. 1.

In May, 1966, I happened on the traces of this interesting species in the Moon Cave of the National Park Cuc phuong in Vietnam. I found merely the left mandible, with strikingly abraded teeth, of a recent specimen among the

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rocks covering the substrate. However, I could satisfy myself on the specific identity of the mandible only lately, in possession of a comparative material. According to our present knowledge, Cuc phuong is the second known southernmost point of occurrence of *Ia io*, and the first known locality in Vietnam. Under the inventory number 70. 4. 1., the mandible was deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest.

Between 17–19 November, 1967, I collected bats by the aid of a nylon mist net in a limestone cave at the village Mausmai, near Cherrapunjee, Assam, India. On the evening of the 19th, I succeeded to capture an adult male *Ia io* by the net set up in the large entrance chamber of the cave. This is the westernmost known record of the range of the species, as well as its first occurrence for the fauna of Assam and India. The specimen—skin and skull—is deposited under the inventory number. 70. 5. 1. in the Hungarian Natural History Museum, Budapest.

With regard to the entire territory of Indo-China, it is not the mandible I collected in Vietnam which is the first record of the occurrence of *Ia io* in that region. The big Vespertilionid, *Parascotomanes beaulieui*, recorded by Bourret (2) from Tran-ninh, the recent Laos, in 1942, is indubitably referable to this species. Even without studying the actual type-specimen, the figures published by BOURRET leave no doubt that this author was dealing with an individual of *Ia io*. He compared the assumably new species with *Scotophilus* and *Scotomanes*, and in his wake, Tate (7), then ELLERMAN et MORRISON-SCOTT (3), also list it provisionally there when discussing *Scotophilus*. BOURRET's description fits *Ia io* perfectly, and his figures are in many respects accurate copies of the species. Since, however, the drawings made of the dentition were obviously made of the unprepared skull left in the animal, the minute second (or external) pair of upper incisors had completely escaped the attention of the author. On these grounds, *Parascotomanes beaulieui* BOURRET, 1942, should be regarded as a junior subjective synonym of *Ia io* THOMAS, 1902.

The holotype (inventory number 2.6.10.2.), deposited in the British Museum (Nat. Hist.), appears to be the smallest known specimen. At my request, Mr. J. E. HILL compared the skull of my Assam specimen with that of the holotype. According to his letter communication—for which my thanks are given also in this place—the specimen I collected "*...agrees almost exactly with the holotype but the rostrum is very slightly wider, the lachrymal width... being 10.5 mm against 10.1 mm in the holotype*". I submit a comparison of the Vietnamese and Indian exemplars with the available literature data in Tables 1 and 2. For the measurements of *Ia longimana* PEN, I referred to the data given partly by PEN et al. (5) partly by KOWALSKI and LI (4). By even a cursory glance at the respective data it appears problematic whether *Ia longimana* could, solely on the basis of its greater dimensions, be considered a distinct species. Already KOWALSKI and LI (4) remarked that "*... the differences of the two living forms seem to be slight and it is very probable that at further investigation they will prove to be the result of an individual or geographic variability of one species*". Beside the measurements, PEN et al. (5) regard the unicuspid I^1 of *Ia longimana* and the bicuspid I^1 of *Ia io* as distinguishing characters between the two species. Care should be taken, however, in the evaluation of this feature, since THOMAS himself remarked at the description of his species (8) that this tooth is much less bicuspid than that of *Eptesicus serotinus*. It is not without interest that TATE (7) gives this tooth as unicuspid in the diagnosis of the

genus *Ia*. It cannot be decided at this later date whether TATE examined from this point of view also the holotype specimen, beyond the exemplar No. 56872 from Szechuan in the American Museum of Natural History. In my Assam specimen, nothing but the finest suggestion of an elevated bar, representing the second cusp, can be discerned. Apart from the individual differences, the shape of this tooth certainly depends on the rate of abrasion concurrent with age. Thus the shape of the upper I^1 can in no way be regarded as a specific feature in the genus *Ia*. In my opinion even the subspecific distinctness of *Ia longimana* is debatable. For a study of the intraspecific categories of *Ia io*

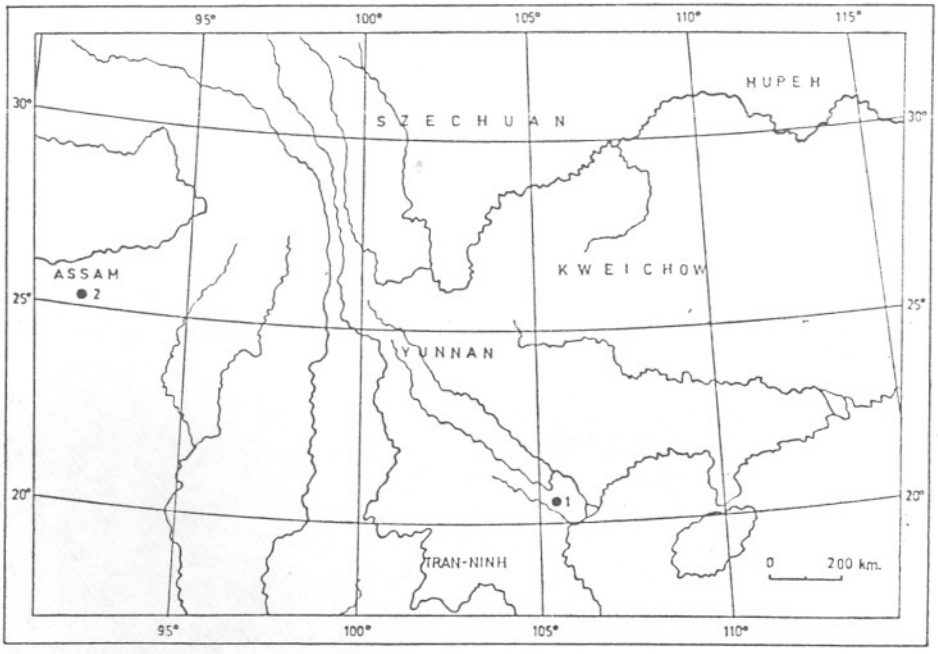

Fig.1. Distribution map of *Ia io*. Solid symbols represent new localities: *1:* Cuc phuong, Vietnam; *2:* Cherrapunjee, Assam, India

further research material and a deeper knowledge of the range and life-history of the species are necessary. In any case, I consider *Ia longimana* PEN, 1962, a junior subjective synonym of *Ia io* THOMAS, 1902.

Little is known about the ecology of this rare species. KOWALSKI and LI (4) mention that the material described by PEN was collected in a cave 1700 m a.s.l., and that all previously secured specimens had also been captured in caves. The data submitted by PEN et al. (5) are valuable as regards the breeding of *Ia*. According to KUZYAKIN, his animals were found in a stone niche, a small cave. I found the Vietnamese mandible in a cave situated in a tropic karst forest 400 m a.s.l. The site of the Assam specimen is 1600 m a.s.l., in a rather dense karst forest, subtropic in character, with *Dracena* and an evergreen *Quercus* as the dominant plant species. There is a stream, abounding in water, not far from the cave, and the richly stalactic cave itself manifestly owes its existence

to these water currents (though actually running waters are present only during the monsoon period in the cave). Preceding the successful capture of the species in this site, I observed for a short time, when standing in the foreground of the cave about 5.30 p.m., three exemplars of the species fluttering one after the other into the cave. One of them even hit the badly stretched net on that occasion. The actual capture was made, with the net in a modified position, at 5.40 p.m. next night therefore about three-quarters of an hour after nightfall, in complete darkness. The specimen, flying into the cave from outside, flew into the net about 60–70 cm above the ground. The animals spend the daytime obviously not in the cave, and use it only for their nocturnal quarters. The specimens had probably returned from their first hunting course. In the light of results obtained from ringing investigations, one might justly suppose that

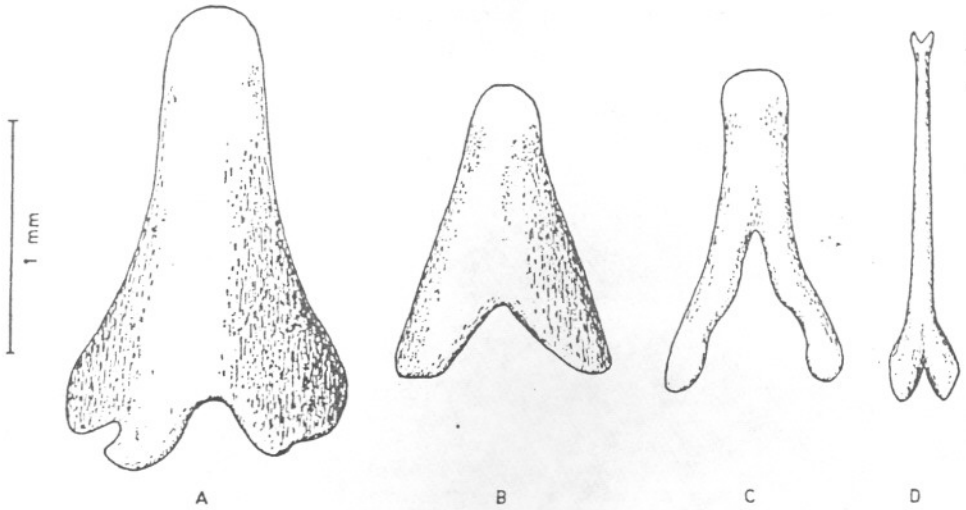

Fig. 2. Dorsal view of bacula of *Ia io* (A), *Eptesicus serotinus* (B), *Eptesicus nilssoni* (C), *Pipistrellus pipistrellus* (D)

these big-sized vespertilionids are able to undertake many hundreds or some thousands of miles of migratory journeys. However, the fact of migration cannot be proven in the present case, nor, in truth, its opposite.

Finally, I should like to discuss the generic state of the taxon *Ia*. On the basis of the dental formula $\left(\frac{2}{3}, \frac{1}{1}, \frac{2}{2}, \frac{3}{3}\right)$ — which, by disregarding several other characters, seems in itself to be a rather artificial feature—the genus *Ia* agrees with the species consituting the species *Pipistrellus*. Tate (7) therefore relegated it to the "pipistrelloid" genera, by the absent P^3 and the present P^2. Accordingly, he compares it with the respective genera and finally remarks as follows: "*In many respects Ia is merely a very large Pipistrellus. It could be considered as representing one of the more specialized species groups of that genus*". SIMPSON's (6) action is now really nothing more than the final step, followed also by ELLERMAN et MORRISON-SCOTT, in drawing *Ia* under *Pipistrellus*. Should, however, TATE have taken in consideration THOMAS' (8) views expressed in the description of the genus and species, namely that "*To the Serotine it is*

Table 1. External measurements (mm) of Ia io

Localities		Head and body	Tail	Ear	Tragus	Forearm	Tibia	Hindfoot
Cherrapunjee, India Hung. Mus. 70.5.1.	♂	103.6	66.3	27.0	10.6	76.6	34.5	17.6(s.u.)
Hupeh (Holotype) Brit. Mus. 2.6.10.2.	♀	104	63	24	—	71.5	—	—
Szechuan Amer. Mus. 56872	—	89	61	25	—	72	—	18
Szechuan Amer. Mus. 56873	♂	—	—	—	—	74	—	—
Tran-ninh *"Parascotomanes"*	♂	—	62	22	—	78	—	16
Szechuan *"Ia longimana"*	2 ♂♂	89—95	65—70	27	—	73—77	32—34	14—15
Szechuan *"Ia longimana"*	53 ♀♀	86—101	65—83	23—29	—	72—80	32—36	13—15.5

related by its general form, the proportions of its ears and tragus, and the structure of its incisors and molars; and its retention of the little premolar above is the only point in which it agrees with the Pipistrelle", then he should have had only to modify the phylogenetic tree of the "eptesicoid genera" proposed by him, and therein to discuss the genus *Ia*. There is no doubt that the skull and dentition of *Ia io* agree in many respects with, e.g. the cranial and dental structure of *Eptesicus serotinus*, hence it is not merely owing to its strikingly bigger size that the taxon should be kept apart from *Pipistrellus*. In my opinion, one of the most important and clearly decisive feature lies in the characteristics of the os penis, precluding any possibility of a nearer relationship with *Pipistrellus*. A comparison of the os penis of the species with that of *Eptesicus serotinus*, *E. nilssoni*, and *Pipistrellus pipistrellus* is given in Fig. 2. The total length of the os penis of *Ia io* is 1.88 mm, its greatest width 1.15 mm, its greatest height 0.8 mm. It is situated in the apex of the glans penis, a short, triangularly distending bone (in the dorsal view), in its wider part arcuate like a roof. This form truly differs from the basic *Pipistrellus* type (TOPÁL, 9), displaying elongated, often aciculiform, shapes. In this latter case, it is not only the basal portion which branches out, but also the apical part bifurcates or becomes spatulately ramifying. On the other hand, the os penis of *Ia* decidedly resembles that of the *Eptesicus* species. Finally, the presence of P^2 is sufficient to upheld the generic distinctness of *Ia* against *Eptesicus*.

To sum up, the known range of *Ia io*, hitherto apparently delimited to China, has by recent data (the specimens from Assam and Vietnam) been considerably extended (by 500 to 700 km) both westwards and southwards. It was found furthermore that *Parascotomanes beaulieui*, described from Indo-China in 1942, also belongs to this species. A comparison of measurements and other morphological observations leave no doubt that the specific distinctness of

Table 2. Cranial measurements (mm) of Ia io

Localities		Total length skull	Zygomatic width	Breadth braincase	Mastoid width	Lachrymal width	Canine width	M^3—M^3 width	C—M^3 length	Mandible length	C—M_3 length	P_4—M_3 length	M_1—M_3 length
Cherrapunjee, India Hung. Mus. 70.5.1.	♂	27.0	17.7	12.0	14.2	10.5	8.8	10.9	10.6	20.7	11.7	9.0	7.7
Cuc phuong, Vietnam Hung. Mus. 70.4.1.	—	—	—	—	—	—	—	—	—	20.8	12.0	9.3	7.9
Hupeh (Holotype) Brit. Mus. 2.6.10.2.	♀	27.0	17.0	—	—	10.1	—	—	10.9	—	11.6	—	—
Szechuan Amer. Mus. 56 872	—	27.2	16.7	—	13.8	—	—	—	11.8	—	12.0	—	—
Szechuan Amer. Mus. 56873	♂	27	17	12.2	14.0	10.0	8.6	—	10.4	—	—	—	—
Szechuan *"longimana"* Peking, 17553	♂	28.7	17.6	—	14.4	—	—	11.4	10.9	22.1	11.7	9.0	7.7
Szechuan *"longimana"* Peking, 17554	—	—	—	—	—	—	—	—	—	21.5	11.8	9.4	8.1
Szechuan *"longimana"* Peking, 17555	—	—	—	—	—	—	—	—	—	20.8	11.9	9.0	7.5
Szechuan *"longimana"* Peking, 17556	—	—	—	—	—	—	—	—	—	22.8	11.9	9.3	7.9
Szechuan *"longimana"* Peking, 17557	♀	29	17.9	—	14.3	—	—	10.8	10.8	20.9	11.7	9.1	7.5
Choukoutien No. 2.	—	—	—	—	—	—	—	—	—	22.1	11.9	9.5	8.2
Choukoutien No. 10.	—	—	—	—	—	—	—	—	—	22.0	12.4	9.7	8.2
Choukoutien No. 11.	—	—	—	—	—	—	—	—	—	21.8	11.5	9.5	7.8
Choukoutien No. 13.	—	—	—	—	—	—	—	—	—	21.7	12.6	9.4	7.6

Ia longimana, described from Szechuan in 1962, cannot be recognized. Finally, not only the cranial and dental characteristics but also the os penis, examined for the first time in the specimen deriving from Assam, prove that the genus *Ia* is related to the genus *Eptesicus*. Nevertheless, its dentition precludes a synonymization and assures its generic distinctness.

ZUSAMMENFASSUNG

Das erste Vorkommen von Ia io Thomas, 1902 aus Vietnam, nebst einigen Bemerkungen über die systematische Stellung der Arten Parascotomanes beaulieui Bourret, 1942, Ia longimana Pen, 1962 und der Gattung Ia Thomas (Chiroptera, Vespertilionidae)

Der Verfasser berichtet darüber, daß seinen Sammlungen und Beobachtungen nach, die sich bisher bloß auf das Gebiet Chinas beschränkende Verbreitung von *Ia io* sowohl nach Westen als auch nach Süden zu in bedeutendem Maße, um 500—700 km ausgedehnt hat. Die Art ist nämlich aus Assam (Indien) und aus Vietnam gleichfalls zum Vorschein gekommen. Es wird bewiesen, daß die aus Indochina im Jahre 1942 beschriebene Art *Parascotomanes beaulieui* auch zur erwähnten Art gehört. Der Vergleich der gemessenen Angaben und auch sonstige morphologische Beobachtungen lassen keinen Zweifel aufkommen, daß die aus Setschuan im Jahre 1962 beschriebene *Ia longimana* ebenfalls nicht als selbständige Art betrachtet werden kann.

Der Verfasser weist aber auch noch nach, daß nicht nur die Merkmale des Schädels und des Gebisses, sondern in erster Reihe die zum ersten Male untersuchten Penisknochen (Os penis) den Beweis dafür liefern, daß das Genus *Ia* mit der Gattung *Eptesicus* in Verbindung steht. Aufgrund des Gebisses kann es jedoch als selbständige Gattung angesehen werden.

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