

Fœnus bicarinatus, sp. n.

♀. Nigra; mandibulis basi, pedibusque anticis fusco-ferrugineis; tibiis anticis intermediisque supra, tarsis anticis intermediisque apice infuscatis, tarsisque posticis, metatarsi tertio basali articuloque quinto exceptis, albidis; terebra rufo-testacea abdomine paullo longiore, valvulis apice flavidulis et dilatatis.

Long. 22 mm.; terebræ long. 15 mm.

♀. Head not very strongly narrowed behind the eyes, slightly swollen transversely behind the ocelli, opaque and coriaceous, the hind margin distinctly carinated. Eyes separated from the hind margin of the head by a distance equal to nearly half their own length; posterior ocelli in a line with the summit of the eyes, twice as far from each other as from the eyes. Cheeks half as long again as the first joint of the flagellum, a longitudinal carina between the antennæ, the front depressed on each side above the base of the antennæ; second joint of the flagellum twice as long as the first, third more than half as long again as the first and second combined. Neck rather short; angles of the pronotum almost unarmed. Mesonotum irregularly transversely rugose-striate; with two longitudinal carinæ from near the middle of the anterior margin not reaching the middle of the præscutum, the space between the carinæ transversely striated and deeply depressed. Pleuræ rugose; median segment rather coarsely rugose, convex, with a longitudinal carina, the sides of the segment above the hind coxæ with a few coarse striæ. Hind coxæ shining, rather indistinctly transversely striated. Hind metatarsus as long as the four apical tarsal joints combined. Radius sharply bent upwards towards the costa at about two-thirds from the base, as in *breviscutum* and other allied species.

Hab. Swan River, Western Australia.

Easily distinguished by the strong carinæ on the mesonotum.

XXI.—A revised Classification of the Otomyinæ, with Descriptions of new Genera and Species. By OLDFIELD THOMAS.

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THE very striking cranial and dental characters found among the different species of what has hitherto been considered the single genus *Otomys*, have long seemed to indicate that some subdivision of the genus would be advisable.

In Mr. Wroughton's admirable monograph of *Otomys**, the characters used are almost entirely dental, little attention being paid to the skull. Now, however, taking cranial characters into full consideration, I find that the group appears to be divisible into three genera, as shown below.

Although not easily defined in a key, the general shape of the skull is quite distinctive of the three genera, and is, I consider, the best indication of their relationships. On the other hand, the grooves on the incisors, and the numbers of the molar laminae, used so effectively by Wroughton and Dollman for the sorting of the species, are so plastic, and show so wide a range of variation, that, however useful for specific distinction, they have to be used with great caution when generic divisions are in question.

On this account, while distinguishing as full genera the obviously natural groups typified by *O. brantsii* and *O. unisulcatus*, I have thought it better only to consider those represented by *O. anchietæ* and *laminatus* as subgenera of *Otomys*, their distinction being almost entirely based on the plastic dental characters. And the same with *Parotomys brantsii* and *littledalei*.

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| A. Nasals not excessively expanded anteriorly. Tendency to grooving of incisors and extra lamination of molars less; lower incisors not or very faintly grooved; m^3 with 4 or, at most, 5 laminae. | |
| a. Bullae very large. No special nasal broadening. M^3 composed of two complete laminae and a modified posterior portion | 1. <i>Parotomys</i> , g. n. |
| a ² . Upper incisors grooved | 1 a. <i>Parotomys</i> , s. s. |
| b ² . Upper incisors smooth | 1 b. <i>Liotomys</i> , subg. n. |
| b. Bullae normal. A slight nasal broadening. M^3 composed of three complete laminae and a posterior trefoil | 2. <i>Myotomys</i> , g. n. |
| B. Nasals excessively broadened anteriorly, the premaxillae outside them not or scarcely visible from above. Tendency to grooving of incisors and extra lamination of molars at a maximum; lower incisors, as well as upper, deeply grooved; m^3 with 6 laminae or more† | |
| c. M_1 composed of 4 laminae | 3. <i>Otomys</i> . |
| d. M_1 with more than 4 laminae. | 3 a. <i>Otomys</i> , s. s. |
| c ² . M_1 with 5 laminae, m^3 with 7 | 3 b. <i>Anchotomys</i> , subg. n. |
| d ² . M_1 with 6-7 laminae, m^3 with 9-10 | 3 c. <i>Lamotomys</i> , subg. n. |

* Ann. & Mag. N. H. (7) xviii. p. 264 (1906). See also Dollman's paper on the East African forms, *op. cit.* (8) xv. p. 149 (1915).

† Five in *O. denti*.

1. PAROTOMYS*, gen. nov.

Genotype. *B. brantsii* (*Otomys brantsii*, Smith).

Skull short, high, considerably bowed. Its general shape showing no trace of the characteristic form found in typical *Otomys*. Muzzle narrow, the nasals not particularly broadened anteriorly. Interorbital region not specially contracted, its edges with well-marked thickened beads and postorbital projections. Interparietal nearly as long as broad. Bullæ very large; meatus with a strongly projecting thickened collar on its anterior edge prominently visible from above; the meatal greater than the zygomatic breadth of the skull.

Teeth. Upper incisors with either one distinct and one indistinct groove (*Parotomys*, s. s.), or with none at all (subgenus *Liotomys*). Lower incisors without any trace of grooves.

Third upper molar with four laminal elements, the posterior ones somewhat modified. Front lower molar also with four, the two anterior partially coalesced. .

This genus is most distinct from the other *Otomyinæ*, no forms being known at all intermediate in either skull or tooth characters. It may again be subdivided into two, as follows:—

1 a. PAROTOMYS, s. s.

Upper incisors with one distinct outer and one indistinct inner groove. Zygomatic plate evenly convex anteriorly. Palatal foramina short. Bullæ nearly spherical.

Genotype as above.

1 b. LIOTOMYS†, subgen. nov.

Upper incisors quite without grooves, like the lower. Zygomatic plate more or less cut back anteriorly. Palatal foramina of medium length. Bullæ more or less oval.

Genotype:—

Parotomys (*Liotomys*) *littledalei*, sp. n.

Size and general appearance as in *P. brantsii*. Colour very much as in the typical (Namaqualand) race of that species, though slightly darker, and so verging towards that of *P. b. luteolus*. The back rather darker than "cinnamon-buff," the sides and belly paler buff, the hairs very broadly

* παρά, beside + *Otomys*.

† λείος + *Otomys*.

slaty basally. Hands and feet buffy white. Tail apparently longer than in *brantsii*, though satisfactory measurements are not available; well haired, dark buffy above, paler below, a variable portion of the upper side of the end of the tail brown or blackish, but this is sometimes scarcely perceptible.

Skull and teeth as indicated in the synopsis and subgeneric diagnoses above.

Dimensions of the type:—

Head and body 157 mm.; tail 97; hind foot 26.

Skull: greatest length 37.6; condylo-incisive length 36; zygomatic breadth 20; nasals 12.8×4.2 ; interorbital breadth 6; meatal breadth 21.5; palatilar length 17; palatal foramina 7; bullæ 12.3×8 ; upper molar series (crowns) 7.2.

Hab. Bushmanland. Type from Tuin, Kenhart.

Type. Old male. B.M. no. 12.4.25.9. Original number 7. Collected 16th July, 1911, by Maj. H. A. P. Littledale. Five specimens.

The specimens of this remarkable animal were placed with the collection of *Otomys brantsii* without examination of the skulls, which were cleaned and put away later. Now, however, study of the skulls shows that Major Littledale's animal is wholly different, and represents a really interesting discovery.

2. MYOTOMYS *, gen. nov.

Genotype. *M. unisulcatus* (*Otomys unisulcatus*, Bts.).

Skull with more indication of an approach to that of *Otomys*. But the muzzle is not modified in the peculiar way characteristic of that genus, the nasals being but little broadened anteriorly, so that the premaxillæ are always clearly visible from above outside them. Interorbital region not specially contracted; its edges with distinct beads, which evenly diverge backwards instead of abruptly curving outwards to form postorbital projections, as is the case in *Otomys*. These beads scarcely run any distance on to the parietals. Other skull-characters much as in *Otomys*.

Teeth not very highly specialized. Upper incisors generally with one narrow groove, which is, however, occasionally obsolescent. Lower incisors not or very faintly grooved. Third upper molar not greatly laminated, the usual condition being three complete laminae and a posterior trefoil, which

* $\mu\upsilon\varsigma + Otomys$.

may in some cases represent two laminal elements; the total therefore usually four and never more than five. First lower molar composed of four laminae or their equivalents, as in *Otomys*.

This genus, although clearly worthy of being distinguished as such, shows more relationship to *Otomys* than is the case with *Parotomys*. One species, indeed, *M. turneri*, both has more expanded nasals than is normal and has clearly five laminae in its m^3 ; but even then there is no equality with the specialized condition found in true *Otomys*, and the frontal ridges are quite as in *Parotomys*, not as in *Otomys*.

The following forms belong to this genus :—

broomi, Thos.

granti, Thos.

sloggetti, Thos.

turneri, Wrought.

unisulcatus, Bts.

3. OTOMYS, F. Cuv.

Genotype. *O. irroratus*, Bts.

Skull highly specialized. Muzzle with an exaggerated expansion of the nasals in their anterior half, where they are bent down laterally, and quite hide the premaxillae from above. Interorbital region contracted, its edges with high ridges, which posteriorly turn abruptly outward to form postorbital processes, and then run backwards across the parietals.

Teeth. Incisors much grooved, the upper with one well-defined groove just outside the middle, the lower with one broad and deep outer groove and on the inner side either the faint indication of a second groove, a shallow but distinct groove, or a deep and distinct second groove, all stages between the three being present.

Molars with great tendency to extra lamination, the third upper molar with from six to ten laminae (five in *O. denti* only) and the first lower with from four to seven.

It does not appear possible to separate satisfactorily the species with two grooves on the lower incisors (*typus* and its allies *) from the ordinary *Otomys* with only one, as the intergradation in the depth and conspicuousness of the grooves is too complete. On the other hand, two species, *anchietæ* and *laminatus*, show such differences in the number of the molar laminae that I have thought they should be

* Representing *Oreinomys*, Trouess.

subgenerically separated, thus making three subgenera, as follows :—

3 a. OTOMYS, s. s.

Genotype. *O. irroratus*, Bts.

First lower molar with four laminae ; last upper with 5 to 8.

3 b. ANCHOTOMYS *, subgen. nov.

Genotype and only species. *O. anchietæ*, Boc.

First lower molar with five laminae ; last upper with seven.

3 c. LAMOTOMYS †, subgen. nov.

Genotype and only species. *O. laminatus*, Thos. & Schw.

First lower molar with 6–7 laminae ; last upper with 9–10.

Otomys contains the great mass of the species of the group, and has by far the largest range, extending from the Cape to Abyssinia, while the other two genera are both confined to South Africa.

The following new forms of this genus appear to need description :—

Otomys irroratus cœnosus, subsp. n.

Size averaging very large, the skull-length of large specimens greater than in any other *Otomys*.

Colour a dark muddy greyish, darker than in *O. i. auratus*, greyer, especially on the sides and rump, than in true *irroratus*.

Skull as in true *irroratus*, but averaging larger. Laminae of m^3 always 6 in number.

Dimensions of the type (measured in the flesh) :—

Head and body 201 mm. ; tail 125 ; hind foot 32·7 ; ear 23·5.

Skull : greatest length 46·3 ; condylo-incisive length 43·5 ; zygomatic breadth 23·2 ; nasals $20\cdot5 \times 9\cdot2$; interorbital breadth 4 ; upper molar series 9·2.

Hab. Kuruman, Bechuanaland. Alt. 4000'.

Type. Adult male. B.M. no. 4. 4. 8. 13. Original number 20. Collected 14th February, 1904, by R. B. Woosnam. Seven specimens.

By their great average size and muddy-grey colour these *Otomys* seem distinguishable from the ordinary *O. irroratus*,

* ἄγχι, near + *Otomys*.

† λάμος, the maw (also voraciousness) + *Otomys*.

although isolated individuals from elsewhere may be nearly as large. The skull of the type even exceeds in length, though not in bulk, that of the large *O. (Anchotomys) anchietæ* of Angola.

Otomys rowleyi, sp. n.

Like *O. irroratus* superficially, but apparently really a representative in Portuguese S.E. Africa of the 7-laminated forms of the Zambesi and northwards.

General appearance and colour quite as in *O. irroratus cupreus*, but the fur shorter and coarser. Ears and tail not very heavily furred.

Skull of medium size, about equalling that of *O. irroratus*. Nasals differing from those of other S. African forms by their even expansion anteriorly, and the absence of a definite angle at the point where the narrow part passes into the broad—this character quite uniform in the one adult and four young specimens before me. All the other S. African forms have a marked angle at the point referred to.

Teeth. Third upper molar with seven laminae in every specimen, this number being that characteristic of the Zambesi and more northward *Otomys*, only rarely and exceptionally occurring in *O. irroratus*.

Dimensions of the type (measured in the flesh):—

Head and body 167 mm.; tail 92; hind foot 27; ear 20.

Skull: greatest length 40; condylo-incisive length 37.7; zygomatic breadth 19.7; nasals 18×7.4 ; upper molar series 9.1.

Hab. Coguno, Inhambane, Portuguese S.E. Africa.

Type. Adult female. B.M. no. 6.11.8.77. Original number 1585. Collected 31st July, 1906, by C. H. B. Grant. Presented by Mr. C. D. Rudd.

Accidentally overlooking the fact that one of the series was fully adult, Mr. Wroughton and I provisionally referred this animal in 1906 to *O. irroratus cupreus*, but I now consider that its constant possession of seven laminae in m^1 indicates that it is a southern representative in the low hot coast-lands of the more northern forms characterised by that number of laminae, while only six is usual in *irroratus*. The absence of an angular corner halfway along the lateral nasal sutures is also a character which affines it to some of the more northern forms and distinguishes it from *O. irroratus*.

It is named in honour of Mr. F. R. Rowley, Curator of the Royal Albert Memorial Museum at Exeter, to whom both officially and privately the Mammal Department of the National Museum is greatly indebted for assistance.

Otomys mashona, sp. n.

Most nearly allied to *O. angoniensis*, but greyer and with differently shaped nasals.

Size about as in *angoniensis* or a little smaller. Fur decidedly finer and softer than in that species. General colour very much as in *O. irroratus auratus* or a shade darker, greyer and less brownish than in *angoniensis*; sides and hips distinctly greyer.

Skull with the nasals shorter and proportionately broader than in *angoniensis*, the broad anterior part shorter and the posterior part more rapidly narrowing backwards; lateral sutures without a marked angle, this character distinguishing the species from *irroratus*.

Third upper molar normally with seven laminae.

Dimensions of the type (measured in the flesh):—

Head and body 171 mm.; tail 108; hind feet 30.

Skull: greatest length 41; condylo-incisive length 39; zygomatic breadth 20.3; nasals 17×8.9 ; interorbital breadth 4.3; height from supraorbital edge to alveolus of m^2 13.7; palatilar length 19; upper molar series 9.2.

Hab. Mazoe, Mashonaland, Southern Rhodesia. Alt. 4000'.

Type. Adult male. B.M. no. 95.11.3.13. Original number 44 B. Collected 5th August, 1895, and presented by J. H. J. Darlington.

This *Otomys* was identified by Mr. Wroughton with *O. irroratus auratus* of Vredefort Road, Orange River Colony, a locality very much farther south, but I venture to think it is more related to *angoniensis* and *rowleyi*, with which it agrees in the number of its molar laminae and its non-angular nasal sutures.

Otomys burtoni, sp. n.

A small species, isolated in the Cameroons.

Size comparatively small. Fur very long and soft, woolly hairs of back about 20 mm. in length. General colour dull grizzled brown with a slight coppery tint, very much as in *O. irroratus cupreus*. Hands and feet dark brown.

Skull not strongly bowed, with rather short muzzle. Nasals of medium broadening anteriorly, the lateral sutures not strongly angular. Interorbital region not heavily ridged.

Upper incisors more pointed backwards than is usual even in this opisthodont genus, the angle (50°) lower than in any

other rodent I have measured; their face with the usual deep outer and obsolescent inner groove. Lower incisors with one broad and partially doubled external groove and the usual obsolescent inner one.

Dimensions of the type (measured on the dry skin):—

Head and body 158 mm.; tail 75; hind foot 26; ear 20.

Skull: tip of nasals to back of frontals 27.5; zygomatic breadth 18.5; nasals 16.5 × 7.5; interorbital breadth 4.1; breadth of brain-case 14.5; height of supraorbital edge from alveolus of m^2 11.6; palatilar length 16.3; diastema 8.5; upper molar series 8.2.

Hab. Cameroons Mountains. Alt. 7000'.

Type. Old female. B.M. no. 7.1.1.196. Collected by "Capt. Burton, H.M. Consul of Fernando Po," later Sir Richard Burton. Received with the collection of Mr. R. F. Tomes.

This Cameroons *Otomys*, widely isolated as it is geographically from all other members of the genus, seems to be most nearly allied to certain of the Central African species, among which, by Dollman's synopsis, it comes closest to *O. tropicalis nubilus* of the Mount Kenya region. It is, however, conspicuously smaller than that animal, nor can I find any other to which it could be assigned.

I have named it in honour of its famous collector, Sir Richard Burton, to whose ability and energies as a naturalist too little credit has been generally given.

XXII.—*The Hedgehog of Palestine and Asia Minor.*

By OLDFIELD THOMAS.

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WHEN writing his paper on the subspecies of *Erinaceus europæus* * Barrett Hamilton referred five specimens in the British Museum from Mount Lebanon to *Erinaceus concolor*, Martin, described from Trebizond. The type of the latter being wholly black it seemed abnormal, and on this account Barrett Hamilton could not distinguish the Mt. Lebanon specimens from it.

Since that date, however, further knowledge and further material bearing on the question of *E. concolor* has accrued. Miller has shown the definite distinction of *E. roumanicus*

* Ann. & Mag. N. H. (7) v. p. 360 (1900).



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