

SMITHSONIAN MISCELLANEOUS COLLECTIONS

VOLUME 82, NUMBER 15

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FROM HISPANIOLA

(WITH TWO PLATES)

BY

GERRIT S. MILLER, JR.

Curator, Division of Mammals, U. S. National Museum



(PUBLICATION 3109)

CITY OF WASHINGTON
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THREE SMALL COLLECTIONS OF MAMMALS FROM HISPANIOLA

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The United States National Museum has received from Haiti and the Dominican Republic three small collections of mammals that have not yet been reported on.

Of these, the first was made in a sheltered side crevice, probably once the nesting place of the giant Haitian barn owl, near the bottom of a deep sink hole called the Trujin, on the massif of La Selle, Haiti. How he explored this cavity by means of a tall pine, felled and lowered into the hole to serve as a ladder, has been told by Dr. Alexander Wetmore in "Explorations and Field-Work of the Smithsonian Institution in 1927," p. 36. The bones from this source are particularly interesting because they represent an almost "pure culture" of the native mammal fauna, nearly uncontaminated by introduced European rodents. Among the Trujin remains is the most nearly complete skull of *Brotomys* yet collected, and a series of *Nesophontes* skulls that indicates the presence of well-defined sexual characters independent of size.

The second collection was made during March, 1929, in caves near En Café on Gonave Island, Haiti, by Arthur J. Poole, who has described his experiences in "Explorations and Field-Work of the Smithsonian Institution in 1929," pp. 71-73. It shows that most of the genera of extinct mammals found in the caves of the Haitian mainland were also represented in the fauna of Gonave.

The third collection is from the neighborhood of Constanza, in the mountainous interior of the Dominican Republic (altitude about 4,000 feet), a region that Herbert W. Krieger visited during the spring of 1930. It consists of two lots of bones. One of these was dug from an Indian refuse deposit, about $2\frac{1}{2}$ feet deep, on the valley floor at Cerro de Monte, 6 km. east of Constanza. The other was contained in owl pellets found in a shelter under an overhanging ledge about 100 feet up the northern flank of Monte Culo de Maco above the Arroyo Limoncillo at a point some 10 km. southwest of Constanza. The mass of about half a peck of dry, partly disintegrated pellets was

brought entire to Washington. In it I found, for the first time, remains of *Nesophontes*, *Brotomys*, and *Isolobodon* in dejecta that appear to be those of the small living barn owl. As usual with this bird the ubiquitous roof rats made up the bulk of the food, as indicated by the undigested remains. The *Brotomys* must have been about the same size as one of these rats, while the *Isolobodon*, a very young individual, could not have been much larger. The finding of these remains in recent owl pellets, and particularly in pellets from the rain forest region where there is no reason to suppose that disintegration is likely to be very long delayed, as it might be in the dry parts of the island, is extremely important. It points to the probability that members of three of the supposedly extinct genera of Hispaniolan mammals may, in reality, be still alive.

(1) TRUJIN COLLECTION

NESOPHONTES HYPOMICRUS Miller

Anterior part of skull, 5; palate, 1; right maxilla, 3; left maxilla, 5; right mandible, 20; left mandible, 20; periotic bones, 30; tympanic rings, 10; sternal manubria, 7; scapulae, 2; humeri, 43; ulnae, 27; radii, 4; innominates, 21; femora, 52; tibiae, 25; astragali, 35; calcanea, 42.

Two of these skulls first called my attention to the fact, afterward verified in many specimens from other localities, that individuals of *Nesophontes hypomicrus* (pl. 2, figs. 1 and 1a) and *N. paramicrus* (pl. 2, figs. 2 and 2a) possess upper canine teeth that are either high and strong or low and weak. The conditions in *N. zamicus* are not yet known. That the weak teeth are not deciduous canines is shown by their presence in old individuals with much worn molars. It seems plain, therefore, that the differences should be attributed to sexual dimorphism and that the individuals with weak canines should be regarded as females, those with strong canines as males. While this conclusion seems necessary it must be admitted that such sexual differences in the size and form of the canine are unusual if not unique among the insectivores. I have been unable to find an approach to it in any of the insectivore genera represented in the National Museum collection.

EPTESICUS HISPANIOLÆ Miller

Skull, nearly perfect, 1; broken rostra, 3; fragments of palate, 37; mandibles, 89. Also many periotics, finger bones, and loose teeth.

The preponderance of remains of this species in the food of an owl that had a varied bat fauna to select from is rather remarkable.

TADARIDA sp.

Mandibles, 2.

RATTUS RATTUS subsp.

Mandible, 1; auditory bulla, 1; femur, 1; tibia, 1; heads of tibiae, 3; astragali, 2; calcaneum, 1; ulna, 1.

These few rat bones were the only remains of introduced European rodents found in the deposit. Bones of the house mouse were entirely absent.

BROTOMYS VORATUS Miller

Imperfect skull, 1; palate and rostrum, 1; right maxillae, 2; left maxilla, 1; left nasal, 1; fragmentary palates, 5; loose cheekteeth, 27; pieces of frontal, 2; pieces of braincase, 2; occipitals, 1; auditory bullae, 2; mandibles, right, 5; left, 5; humeri, 2; ulnae, 4; radius, 1; innominates, 12; sacra, 4; femora, 9; tibiae, 7; heads of tibia, 4; astragalus, 1; calcaneum, 1.

The skull (pl. 1, fig. 2), though imperfect, is the most nearly complete specimen that has yet been found. It permits, for the first time, a rather full comparison with the skull of *Proechimys* (pl. 1, fig. 1), and it shows conclusively that, so far as cranial characters are concerned, the differences between the two animals are of no more than generic importance. Chief among the characters in which the island genus differs from its mainland relative are the broader, deeper, less downward bent rostrum, deeper zygoma (in a perfect specimen this would be even more evident than it is in the slightly injured zygoma of the Trujin skull), less developed supraorbital bead (not well shown in the Trujin skull but obvious in other specimens), and less contrast in size and form between the alveolar pit made by the inner root of each cheektooth and the two pits made by the outer roots. Apparently there is less space between the paroccipital process and the posterior margin of the glenoid fossa, but this may be partly or wholly due to incorrect reconstruction of this part of the skull. The auditory bulla in the Trujin specimen is not exactly in place; it should lie about 1.5 mm. farther back. As compared with the mandible of *Proechimys semispinosus* that of *Brotomys voratus* (see Smithsonian Misc. Coll., Vol. 82, No. 5, pl. 1, fig. 3, December 11, 1929) is more robust. In particular the depth at the sigmoid flexure is noticeably greater in proportion to the total length of the mandible. The coronoid process is larger and the angular process is longer.

In its dental characters *Brotomys* likewise differs no more from *Proechimys* than the latter differs from some of its living South

American relatives. The upper incisors are more abruptly curved and their course is slightly if at all evident on the side of the rostrum or in the antorbital foramen. Similarly the shaft of the lower incisor is less conspicuous on the under side of the mandible; its base does not extend quite so far beyond the root of m_3 as in the case of *Proechimys*. All the maxillary cheekteeth are 3-rooted as in *Proechimys*, but the inner root is merely larger than either of the others and not specialized in form as it is in the South American animal. In both genera the mandibular teeth are 3-rooted with the exception of the 2-rooted premolar. The large root is placed behind and the two small roots in front.

The enamel pattern is less complicated than that of *Proechimys semispinosus*. In all of the teeth except pm_4 the pattern is unmodified pentamerous with the two reentrant folds of the paramere slightly deeper than the single reentrant of the protomere. In the lower premolar the protomere bears a shallow second reentrant fold near the front of the crown. This fold is so shallow that it is soon cut off as an enamel lake. No species of *Proechimys* that I have seen is as simple as this in its enamel folding. The fundamental conditions present in *Brotomys* are, however, exactly reproduced in *Cercomys*, though in this South American genus there is a slight specialization in the form of a peripheral narrowing of the reentrant folds of the metamer which causes these folds to become early isolated as lakes.

PLAGIODONTIA HYLÆUM Miller

Right mandible (no teeth), 1; left auditory bulla, 1; fragment of ulna, 1; fragments of innominates, 2; femur, 1; tibia, 1; epiphysis from head of tibia, 1; astragalus, 1; calcaneum, 1.

PLAGIODONTIA sp. ?

A first or second upper molar, a first or second lower molar, and three separate plates of a larger tooth, apparently m_1 or m_2 , suggest the occurrence of a *Plagiodontia* with teeth more compressed antero-posteriorly than they are in any of the three species now recognized. Two auditory bullae slightly different from those of *P. hylæum* may pertain to this animal.

ISOLOBODON LEVIR Miller

Probably two individuals, both immature, represented by the left half of a palate and three loose teeth.

(2) GONAVE COLLECTION

NESOPHONTES HYPOMICRUS Miller

Two skulls lacking most of the braincase. One retains the right canine; this tooth has the form and size that appears to indicate the female sex.

BROTOMYS VORATUS Miller

Fragment of palate, 1; mandibles, 35.

These specimens appear to agree in all respects with those collected on the Haitian mainland.

ISOLOBODON PORTORICENSIS Allen

Skull, lacking rostrum and teeth, 1; palate with three teeth, 1; right upper premolar, 1; mandibles, 23; humerus, 1.

All of this material is referable to the large *Isolobodon*. The tooth-rows of the 10 largest mandibles range from 19 to 20 mm. in alveolar length, thus closely agreeing with the measurements of 11 jaws of *I. portoricensis* from the mouth of San Juan River, Dominican Republic (19 to 20.8 mm.), and decidedly exceeding those of 15 jaws of *I. levir* picked for their large size from a series of 281 collected in the vicinity of Monte Cristi (16 to 17.6 mm.).

APHÆTREUS MONTANUS Miller

Six mandibles, all from immature individuals.

HEXOLOBODON PHENAX Miller

Imperfect mandible of a young individual, with pm_1 in place.

Two bullae, an atlas, and the lower extremity of a femur, all of which appear to be too large to have pertained to an *Isolobodon*, may represent this animal.

ACRATOCNUS COMES Miller

Upper canine, 1; imperfect molariform teeth, 2; left fourth metacarpal, 1; phalanges, 2; centrum of vertebra, 1.

(3) CONSTANZA COLLECTION

(A) OWL DEPOSIT

NESOPHONTES PARAMICRUS Miller

Anterior part of skull, 1; braincase, 1; mandibles, 11; humeri, 4; femora, 10.

All of these bones were found in the mass of partly disintegrated owl pellets. Many of them have the appearance of such freshness that it is easy to believe that they were dropped by the owls within a period not greater than a year or two before the time of Mr. Krieger's work. One of the femurs, for instance, retains a patch of dried tissue on the anterior basal portion of the greater trochanter and a loose web of hairs in the digital fossa and concave inner aspect of the greater trochanter. The braincase (pl. 2, fig. 3) is packed full of hair by the action of the owl's stomach, and the broken anterior part of a skull (pl. 2, fig. 3a) gives similar evidence of recent submission to digestive action. Most of the jaws have hairs adhering to the teeth or in the spaces between the roots. One has a felt-like mass plastered against the inner side of the ascending ramus.

As regards specific characters this material appears to be in perfect accord with the original material from St. Michel, Haiti.

NESOPHONTES HYPOMICRUS Miller

Imperfect rostra, 2; mandibles, 14; humerus, 1; femora, 3; tibiae, 4.

In one of the imperfect rostra the antorbital canal is packed with hair and there are tufts of hair in the spaces between the teeth. Most of the jaws have hairs adhering to the teeth.

NESOPHONTES ZAMICRUS Miller

A mandible, an ulna and a tibia represent this species. All three bones have traces of hair and other organic matter adhering to their surfaces. The mandible measures: total length, about 13 mm.; depth through coronoid process, 4.0; distance from articular process to anterior border of first molar, 8.4; combined four molariform teeth (alveoli), 5.2.

PHYLLOPS HAITIENSIS (J. A. Allen)

Broken skull of one individual and mandible of another.

EPTESICUS HISPANIOLÆ Miller

Broken skull and nearly perfect jaw, both apparently parts of one animal. The scarcity of bat remains is a peculiar feature of this owl deposit.

BROTOMYS VORATUS Miller

A mandible and femur. The femur is smeared with hair and half digested organic material. Its digital fossa and concave inner surface

of the greater trochanter are packed with a felt-like mass of fine hair (pl. 2, fig. 5), in the same condition as the femur of a roof rat (pl. 2, fig. 4) near which it was found.

ISOLOBODON sp.

Two halves of the palate from a young individual. On the left side the teeth have fallen out and the alveoli are packed with hair (pl. 2, fig. 6a). The femur of a young hystricoid rodent (pl. 1, fig. 6) is probably a part of the same animal. It is shorter and decidedly more robust than the femur that I refer to *Brotomys*.

(B) INDIAN DEPOSIT

Mr. Krieger informs me that he found numerous kitchenmiddens on the valley floor near Constanza. In most of those that he examined there were few bones, and these few were fragmentary. The midden at Cerro de Monte, from which he took numerous mammalian remains in fairly good condition was not more than 20 feet long, 6 feet wide and 2½ feet deep. In it he found no artifacts of Spanish origin; but the collection includes an atlas, calcaneum, astragalus, phalanx, and six teeth of the domestic pig (pertaining to at least two individuals) an upper molar of a colt, and five mandibles, two femurs and a humerus of *Rattus rattus* subsp. All of these remains of European mammals, together with a few human bones, are in exactly the same condition as the bones and teeth of the extinct rodents with which they were associated.

NESOPHONTES PARAMICRUS Miller

A femur 18 mm. in length unquestionably pertains to this species. Its presence in an open kitchenmidden like the one at Cerro de Monte rather strongly suggests that the Indians may have used the small insectivores, as well as the large *Solenodon*, for food. The humerus of *Nesophontes* that I found in the kitchenmidden in a cave on San Lorenzo Bay might easily have been dropped there by an owl (Smithsonian Misc. Coll., Vol. 82, No. 5, p. 4, December 11, 1929). Such an origin for the femur at Cerro de Monte seems unlikely.

BROTOMYS VORATUS Miller

Mandible, 1; femur, 1.

PLAGIODONTIA ÆDIUM F. Cuvier

Palates, 2; mandible, 1; odd cheekteeth, 4. One of the palates is represented on plate 2 (fig. 7).

PLAGIODONTIA HYLÆUM Miller

Palate with full set of teeth, 1 (pl. 2, fig. 8); premaxillae with incisors, 2; occipitals, 2; mandibles, 6.

ISOLOBODON LEVIR (Miller)

Palates, 4 (one with full set of teeth); premaxillae with incisors, 7; mandibles, 34 (18 left, 16 right). Also numerous small bones and fragments of skulls that appear to have pertained to this animal.

CAVIA PORCELLUS (Linnæus)

(Plate 2, figs. 9, 9a)

Fragment of zygoma and palate with pm^4 in place, 1; mandibles, 4 (2 left, 2 right); femora, 2. One of the femora pertained to an adult, the other to a young animal. The mandibles (two of which are figured on pl. 2, figs. 6 and 6a) represent four individuals. They are similar to those that Mr. Krieger unearthed at Anadel in 1929 (see Miller, Smithsonian Misc. Coll., Vol. 82, No. 5, p. 11, December 11, 1929), and I am unable to detect any characters by which they can be distinguished from jaws of the ordinary domestic animal. The same is true of the right half of a palate with all four teeth in place that Mr. Krieger collected at Boca Chica, on the coast about 20 miles east of Santo Domingo City in 1930.

From Oviedo's account of the "cori" it seems evident that guinea-pigs were well known to the Spaniards at Santo Domingo City during the first half of the sixteenth century. Whether they brought the animals from South America or found them already in the possession of the natives at the time when Hispaniola was discovered is a question that may never be answered. I was originally inclined to suppose that the Spaniards themselves were responsible for the occurrence of guinea-pigs on the island (Smithsonian Misc. Coll., Vol. 82, No. 5, p. 14, December 11, 1929). Oviedo's record for Santo Domingo City and Mr. Krieger's discovery of remains at Boca Chica and on the shore of Samaná Bay are in accord with this supposition, as both localities were settled by the Spaniards. In fact, some remnants of a Spanish house can still be seen at Anadel in the same field with the kitchenmidden. But it is less easy to harmonize the belief in Spanish

introduction of the guineapig with the finding of the animal's remains at such a remote and inaccessible locality as Constanza. This may point, like the occurrence of a South American monkey's teeth in a Precolumbian grave in Cuba (Miller, *Smithsonian Misc. Coll.*, Vol. 66, No. 13, December 8, 1916), to early native trade between South America and the Greater Antilles; but it must be admitted that the presence of remains of pig and horse in the midden near Constanza counts against such a view.

EXPLANATION OF PLATES

PLATE I

All figures natural size

- FIGS. 1, 1a, 1b. *Proechimys semispinosus* Tomes. No. 113273, U. S. Nat. Mus. San Javier, Ecuador.
- FIGS. 2, 2a, 2b. *Brotomys voratus* Miller. No. 255696, U. S. Nat. Mus. Trujin, Massif de La Selle, Haiti. Altitude 6,500 feet.

PLATE 2

Figs. 1-3 enlarged $\frac{1}{2}$, other figures natural size

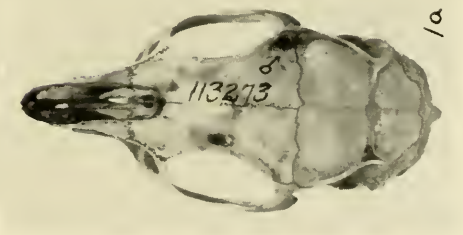
- FIG. 1. *Nesophontes hypomicrus* Miller, male. No. 255697, U. S. Nat. Mus. Trujin, Massif de La Selle, Haiti.
- FIG. 1a. *Nesophontes hypomicrus* Miller, female. No. 255698, U. S. Nat. Mus. Same locality.
- FIG. 2. *Nesophontes paramicrus* Miller, male. No. 255699, U. S. Nat. Mus. St. Michel, Haiti.
- FIG. 2a. *Nesophontes paramicrus* Miller, female. No. 255700, U. S. Nat. Mus. St. Michel, Haiti.
- FIGS. 3 and 3a. *Nesophontes paramicrus* Miller. Nos. 255301 and 255300, U. S. Nat. Mus. Near Constanza, Dominican Republic. From owl pellets.
- FIG. 4. *Rattus rattus* subsp. No. 255701, U. S. Nat. Mus. Near Constanza, Dominican Republic. From owl pellet. Mass of hair in digital fossa.
- FIG. 5. *Brotomys voratus* Miller. No. 255702, U. S. Nat. Mus. Same locality and condition as fig. 4.
- FIGS. 6 and 6a. *Isolobodon* sp. No. 255703, U. S. Nat. Mus. Same locality and condition as figs. 4 and 5. Hair in digital fossa of femur and in two alveoli of palate.
- FIG. 7. *Plagiodontia adium* F. Cuvier. No. 255704, U. S. Nat. Mus. Near Constanza, Dominican Republic. From Indian deposit.
- FIG. 8. *Plagiodontia hylcaum* Miller. No. 255283, U. S. Nat. Mus. Same locality as fig. 7.
- FIGS. 9 and 9a. *Cavia porcellus*. Nos. 255299 and 255296, U. S. Nat. Mus. Same locality as figs. 7 and 8.



1



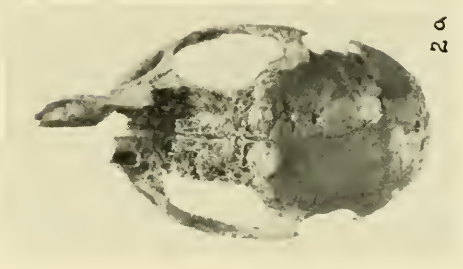
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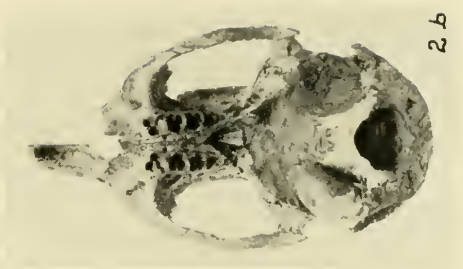
1a



1b



2a



2b

1, *Proechimys*; 2, *Brotomys*.



Insectivores and rodents from the Dominican Republic (1-3, *Nesophontes*; 4, *Rattus*; 5, *Brotomys*; 6, *Isolobodon*; 7-8, *Plagiodontia*; 9, *Caria*).