

## Shrew opossums (Paucituberculata: *Caenolestes*) from the Huancabamba region of east Andean Peru

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Shrew opossums of the genus *Caenolestes* are restricted to the northern Andes and include four species: *C. fuliginosus*, *C. convelatus*, *C. caniventer* and *C. condorensis* (Albuja and Patterson 1996). *Caenolestes fuliginosus* is a highland species of the páramos of central Ecuador, Colombia and western Venezuela, but the remaining three species occur in sub-tropical montane forests at lower elevations (Albuja and Patterson 1996). *Caenolestes convelatus* and *C. caniventer* are known from the western slopes of the Andes, the former from Colombia and northern Ecuador and the latter from southern Ecuador and northern Peru (Bublitz 1987), while the recently described *Caenolestes condorensis* is currently known only from the isolated Cordillera del Cóndor along the eastern slopes of the Andes in southern Ecuador (Albuja and Patterson 1996).

The first records of *Caenolestes* from Peru were collected in the Departamento de Piura (Barkley and Whitaker 1984) and were originally reported as *C. fuliginosus* but later were later identified as *C. caniventer* (Albuja and Patterson 1996). The Departamento de Piura lies just north of the Huancabamba Depression, a region defined by the arid valley of the Rio Chamaya and adjacent low elevation passes (Fig. 1). Many species of Andean bird reach their southernmost distributional limit at the Huancabamba Depression (Parker et al. 1985), and it has been postulated that the region might also serve as a barrier to the southward dispersal of *Caenolestes* (Vivar et al. 1997). However, these same authors also cautioned that the Huancabamba region remains poorly surveyed for mammals and that what may appear to be a pattern may in fact be the result of inadequate sampling. In this paper we present additional data on the distribution of *Caenolestes* from localities in

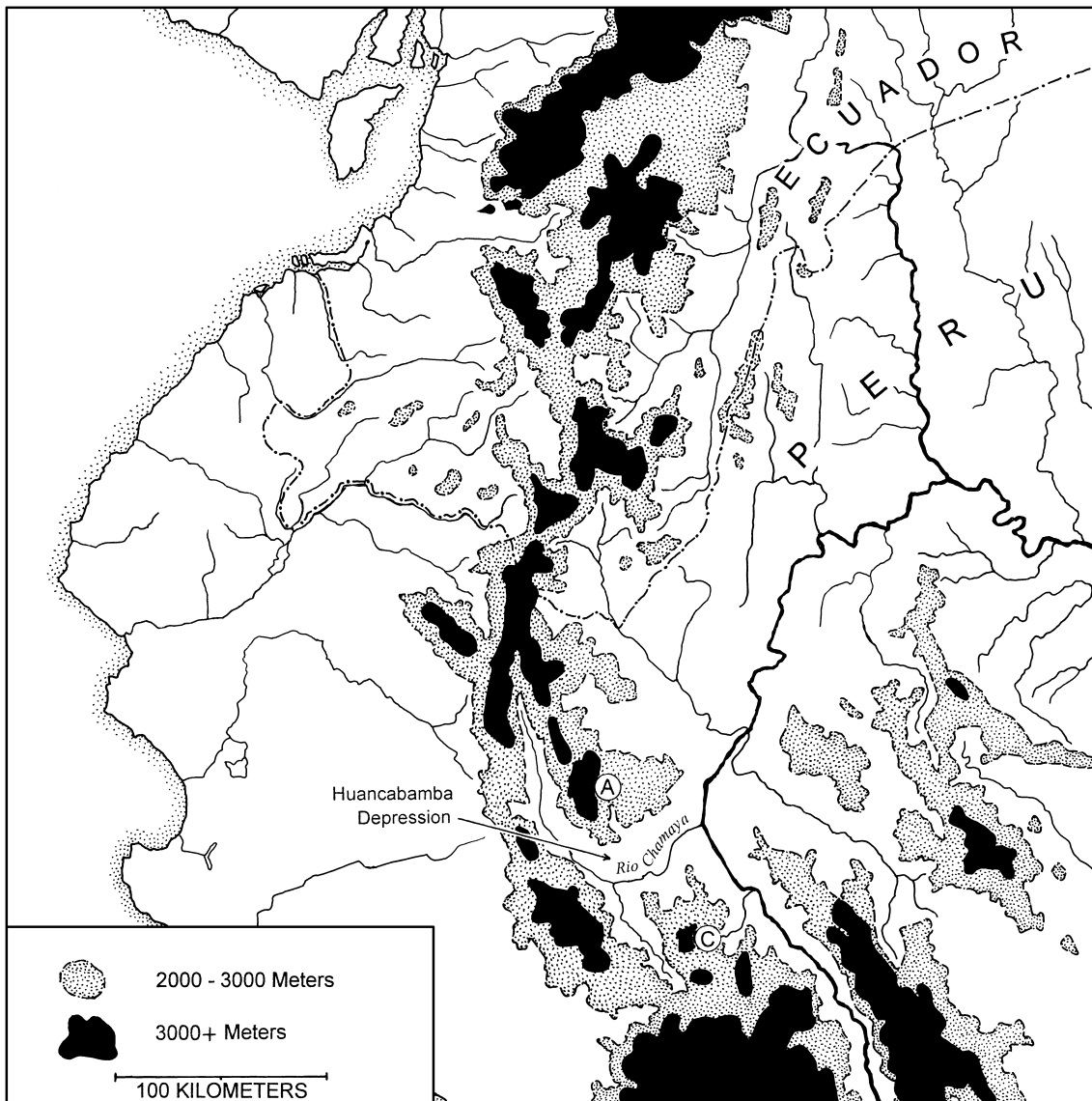
Peru north and south of the Huancabamba Depression.

### Materials and methods

Small mammal surveys were conducted in the Departamento de Cajamarca, Peru in June 1995 and June 1996. Victor and Museum Special snaptraps and Sherman live traps were baited with a 6 : 2 : 2 : 1 mixture of peanut butter, oatmeal, raisins and bacon. Specimens were preserved as either dried study skins and skulls with alcohol preserved carcasses, or as whole specimens that were first fixed in formalin and subsequently transferred to 70% ethanol. Tissue samples were obtained from selected specimens prior to fixation and preserved in ethanol. Skulls were extracted from selected specimens and measured with digital calipers following the variables and definitions used by Albuja and Patterson (1996).

Small mammals were collected from two separate regions in Cajamarca: San Andres de Cutervo (4 km West of San Andres de Cutervo), 2350 m; and the Las Ashitas region (ca. 4 km West of Pachapiriana) (Fig. 1). In the Las Ashitas region we established three closely situated camps referred to on original specimen labels as 'Las Juntas' (2300 m), 'El Chaupe' (2300–2800 m) and 'Las Ashitas' (2800 m). The habitats of San Andres de Cutervo and Las Ashitas were very similar and can be described as primary and secondary sub-tropical montane forest with an estimated canopy height of 15–20 m and a thick herbaceous understory of ferns and saplings. Woody lianas were present but not common and much of the forest was covered with moss and epiphytic plants. The upper limits of our sampling range (2800 m) marked the approximate altitude at which we began to encounter deforested areas overgrown with dense stands of 2–3 m

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**Fig. 1.** Map of northern Peru and southern Ecuador with our collecting localities in Departamento de Cajamarca indicated: Las Ashitas (A) and San Andres de Cutervo (C). The valley of the Rio Chamaya runs between these two collecting localities and, together with the adjacent low elevation passes, broadly defines the Huancabamba Depression.

high *Chusquea* bamboo.

## Results and discussion

In total we collected twenty specimens of *Caenolestes* from Cajamarca (Appendix). All appear to represent a single species that best fits the description of *C. caniventer*. The individual hairs of the dorsal pelage are dark gray at the base with dark brown tips giving the dorsal pelage an overall dark fuscus color. The ventral pelage is lighter, with the individual hairs gray based and tipped with white. The dorsal surface of the hands and feet are light brown and the tail is dark brown dorsally and

slightly paler below. With regards to the pelage, *C. caniventer* is very similar to *C. convelatus* but they can be distinguished cranially: *C. convelatus* has larger molars and a very much reduced or absent antorbital cavity (Anthony 1921, 1924). Albuja and Patterson (1996) further refined the differences between these two similar species by describing the antorbital cavity of *C. convelatus* as “in the shape of a parenthesis or crescent, or else completely roofed by bone; located at the margin of nasal and maxillary bones.” In *C. caniventer* the antorbital cavity is described as “comma-shaped and bounded by the nasal, maxillary, and frontal bones” (Albuja and Patterson 1996). Our specimens of *Caeno-*

**Table 1.** External and cranial measurements (mean, range, number of samples) of *Caenolestes* from Departamento de Cajamarca, Peru compared to those for the holotypes of *C. caniventer*, *C. convelatus* and values for *C. condorensis* reported in Albuja and Patterson (1996).

Measurement	<i>C. caniventer</i> holotype	<i>C. convelatus</i> holotype	<i>Caenolestes</i> Peru: Cajamarca	<i>C. condorensis</i>
Total length	256	256	247 (209–274) 11	260
Tail length	127	124	121 (106–130) 11	130
Hind foot length	26.5	29	26 (23–29) 11	30
Ear length	—	—	16 (15–18) 11	18
Weight	—	—	44.5 (23–61) 11	48
Condylbasal length	32.7	35.8	33.2 (29.7–36.0) 11	36.9 (36.2–37.6)
Zygomatic breadth	16.2	16.5	15.8 (14.4–17.2) 11	17.3 (17.1–17.4)
Nasal length	15.9	18.2	16.4 (14.7–17.6) 9	19.1 (18.7–19.5)
Postorbital constriction	7.3	7.0	7.5 (7.2–7.8) 11	7.4 (7.3–7.5)
Palatilar length	17.6	20.2	18.9 (17.0–20.5) 11	19.9 (19.7–20.2)
Anterior palatal foramen	6.3	7.4	6.4 (5.8–6.9) 11	7.0 (7.0–7.0) 2
Posterior palatal foramen	6.9	6.9	7.2 (6.6–7.8) 11	8.4 (8.1–8.6)
Length of maxillary cheekteeth	7.6	8.5	7.8 (7.5–8.1) 12	8.1 (8.1–8.1) 2

*lestes* from Cajamarca exhibit the antorbital cavity morphology typical of *C. caniventer*, and measurements of the skull most closely approximate this species as well (Table 1). The only other species of *Caenolestes* is *C. condorensis* but this species is much larger and has non-overlapping values for nasal length and posterior palatal foramen length (Albuja and Patterson 1996; Table 1).

Our *Caenolestes caniventer* from Cajamarca are among the first examples of the species from the eastern versant of the Andes and are significant because they were collected from localities to the north and south of the Huancabamba Depression, thereby dispelling the claim that the depression might serve as a barrier to southern dispersal of the genus. Other mammal species with ranges extending south of the Huancabamba Depression were mentioned by Pacheco (2002). The Cajamarca *Caenolestes* also represent the southernmost distributional records of the genus, if one accepts the current taxonomy, which treats *Lestoros* and *Caenolestes* as different genera (Gardner 1993). However, Bublitz (1987) synonymized *Lestoros* with *Caenolestes*, and if Bublitz's hypothesis is correct, the distribution of the genus would then extend six degrees of latitude further south to Bolivia (Anderson 1997).

The relative ease with which we captured specimens of *Caenolestes* leads us to believe that the very few records of the genus from the eastern Andes are probably due to inadequate sampling in the region. Continued surveys are likely to demonstrate the genus to be more widely distributed, and perhaps more diverse than is currently documented.

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## Appendix

Specimens of *Caenolestes* collected as a result of the present survey. Specimens are indicated by American Museum of Natural History Department of Mammalogy catalog number (AMNH) or, for specimens that will ultimately be cataloged in the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, by the field numbers of Darrin P. Lunde (DPL), Jessica A. Amanzo (JA) Jose Luis Mena (JLM) or Victor Pacheco Torres (VPT).

*Caenolestes caniventer*: Peru: Departamento de Cajamarca; San Andres de Cutervo, (JA 142; JLM 190; VPT 1604): Las Ashitas, (AMNH 268101, 268102, 268103, 268104, 268105, 268106, 268107, 268108; DPL 239; VPT 1490, 1500, 1517, 1522, 1524, 1525, 1526, 1553).