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Short Communication

Notes on *Notiosorex crawfordi* (coues) from two oases in the Baja California peninsula, México

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Abstract

Data from distribution, ecology, and stomach contents of four desert shrews, *Notiosorex crawfordi* (Coues), collected from a large gap in their known distribution on the Baja California peninsula, in Mexico is presented in this paper. The contents in the stomach were specimens of the order Araneae, Hymenoptera, Coleoptera, Dictioptera, and Acari, and small quantities of plant material were also found.

Keywords: Soriciomorpha; Desert; Stomach contents; Ecology; Habitat

The desert shrew, *Notiosorex crawfordi*, is thought to have a broad distribution throughout the Baja California peninsula (Hall, 1981; Maldonado, 1999). There are only records from the cape region in the southern tip of the peninsula (Maldonado, 1999) and the central desert (Clark and Yensen, 1982; Yensen and Clark, 1986) with a gap of over 650 km. During our studies of spiders in Baja California, we set transects of pitfall traps in three areas. Comitan, with desert vegetation, and San Jose de Comondu and La Purisima considered oases. No specimens were collected at La Purisima. The weather in the three areas is similar: warm with precipitation in the summer (INEGI, 1995). Specimens were stored in the mammal collection at Centro de Investigaciones Biologicas del Noroeste, La Paz Baja California Sur (CIB 9846–9848).

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At El Comitan, near La Paz, Baja California Sur, 15 m (24°10′ N, 110°21′ W), we set two transects of 11 pitfall traps each, 7 m from both sides of an arroyo. Traps were inspected once per week for 1 year. We made a total of 1144 trap inspections. Associated vegetation in this area was sour pitaya (*Stenocereus gummosus*), cholla (*Cilindropuntia cholla*), lomboy (*Jatropha cinerea*), cardon (*Pachycereus pringlei*), Adam's tree (*Fouquieria diguetii*), elephant tree (*Bursera microphylla*), and mesquite (*Prosopis articulata*). Only one male with no reproductive data was collected in the second week of April (no measurements were taken). The trap was located in an open area; nearby vegetation was sour pitaya and mesquite. No specimens were collected in the other traps. Owl pellets from this area did not include samples of this species (Álvarez-Castañeda et al., 2004).

At San Jose de Comondu, Baja California Sur, 300 m (111°49′ N, 26°03′ W), we set three parallel transects of 15 pitfall traps, which were inspected once every 2 months for 1 year, with a total of 270 trap inspections. Transects began in the arroyo and ended at the canyon wall. The distance between traps was 10 m. The dominant plant species in the area were date palm (*Phoenix dactylifera*), California fan palm (*Washingtonia filifera*), honey mesquite (*Prosopis glandulosa*), lomboy (*J. cinerea*), pearlberry (*Vallesia glabra*), reed (*Phragmites*), and acacia (*Acacia brandegeana*) (Grismer and McGuire, 1993), and groves of mango (*Mangifera indica*) and wild fig (*Ficus carica*) (Fig. 1).

Three females were collected in two traps near the river in an area with wet soil and a deep layer of leaves. The distance between the traps was 10 m. One lactating female (CIB 9846) was collected in April in a trap placed 10 m from the shadow of a pearl berry close to a 60-cm-high stone wall surrounded by date palm, California fan palm, and spiny rush. The two females collected in June (CIB 9847 and 9848) did not show reproductive activity. The pitfall trap was 2 m from an irrigation channel under a date palm and wild fig; the soil surface was covered with boulders >30 cm diameter.

The measurements (mm) of the three specimens from Comondu were: total length, 80, 80, 75; tail length, 27, 27, 20; hind foot length, 8, 7, 7; ear length, 8, 7, 7; and weight (g), 2, 2, 4. Skull measurements (in mm) were: condylobasal length, 15.80, 15.37, 16.08; palatal length, 6.78, 7.14, 7.06; cranial breadth, 7.83, 8.25, 8.01; interorbital breadth, 4.03, 4.02, 3.93; maxillar breadth, 3.61, 3.49, 3.24; length of maxillary toothrow, 6.99, 7.54, etc.

The stomachs of the three (CIB-MAM-01 to 03) female desert shrews collected at San Jose de Comondu were fixed in 70% alcohol and their contents disaggregated for identification under a microscope (63 ×). We compared the remains with specimens in the collections at Centro de Investigaciones Biológicas del Noroeste. Lugol's solution was used for the identification of plant fragments. Stomach contents are listed in Table 1. Most of the animal material could not be identified below the level of order. Fragments of pronotum from specimens of the family Blattidae, genus *Periplaneta*, or *Neostylopyga* were found. In the pitfall traps, we collected two different species *Periplaneta americana* and *Neostylopyga rhombifolia*. The size of the two species is similar; thus, *Notiosorex* probably feeds on both.

Tarsos of *Syspira* sp. of the Miturgidae family were found in the stomachs of the specimens captured. *Syspira tigrina* and *S. longipes* are the species present in the area. *Stanhopea tigrina* is the most frequent species. From the order Hymenoptera we found fragments of antennae, thorax, legs, and waist of only one formicidae family, with at least three genera: *Conomyrma* sp. (subfamily Dolichoderinae), *Neivamyrmex* sp. (Ecitoninae), and *Pogonomyrmex* sp. (Myrmicinae). Genus *Conomyrma* and *Neivamyrmex* were found in the three *Notiosorex* specimens that were examined and *Pogonomyrmex* was found only

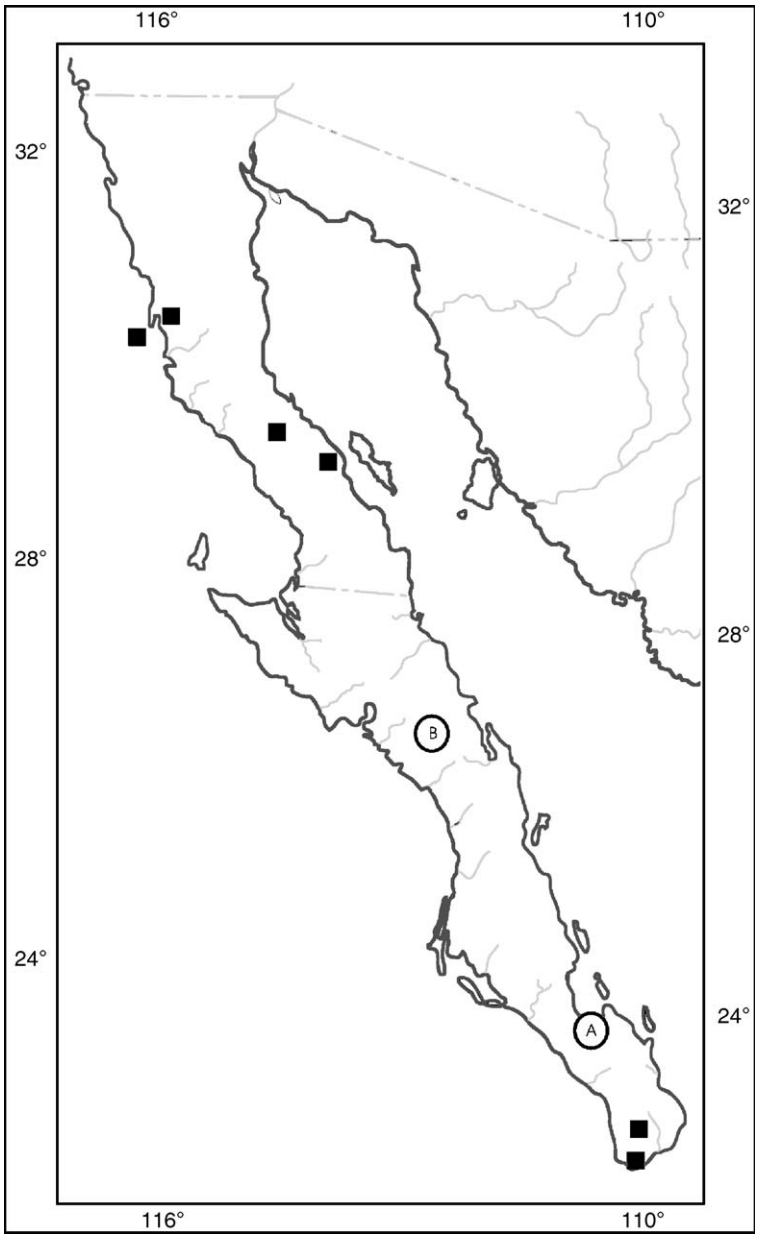

Fig. 1. Localities in this study in the Baja California peninsula: (a) El Comitan, and (b) San Jose de Comondu. Black squares are previously recorded localities for *Notiosorex crawfordi* (Maldonado, 1999).

in one. The species of the genus *Conomyrma* are the most common in the area. The Coleoptera fragment cannot be determined below order level. The Acari are at the nynph stage. The specimens were not chewed and were found attached to the stomach wall.

Table 1
Stomach contents of three female shrew specimens of *Notiosorex crawfordi* from San José de Comondú, in the Baja California peninsula, Mexico

Order	Family	Genus	CIB number		
			9846	9847	9848
Araneae					
	Miturgidae				
		Syspira	×	×	×
Hymenoptera					
	Formicidae				
		Conomyrma	×	×	×
		Neivamyrmex	×	×	×
		Pogonomyrmex			×
Coleoptera			×	×	×
Dictioptera					
	Blattidae				
		Periplaneta	×	×	×
Acari			×		
Vegetation			×	×	×

Order, family and genera are given in those groups in which identification was possible.

For this reason, we believe that the acari were not eaten. Plant fragments were small and present in the three specimens which might be considered as accidentally consumed.

The result of the stomach content analysis is similar to that reported from Texas (Punzo, 2003), with variation in the families present and the relative frequency of each in the order of invertebrates. In both cases, plant material and Acari are reported.

In general, the habitats of La Purisima and San Jose de Comondu are similar marshes. There were some differences in the microhabitats of the two locations, which might account for *Notiosorex crawfordi* being captured only in San José de Comondu. At La Purisima, the canyon was wider, the river was larger, the canyon walls had a gentler slope, and a leaf layer was absent in the area with wet soil. Bordering the oasis, the main plant species are mesquite (*Prosopis palmeri*), cholla (*Cilindropuntia bigelovii*), sour pitaya (*Stenocereus gummosus*), cardon (*Pachycereus pringlei*), and Adam's tree (*Fouquieria diguetii*).

In similar microhabitats of El Comitan and San José de Comondu, other mammalian species that were collected included *Chaetodipus arenarius*, *Chaetodipus rudinoris*, *Chaetodipus spinatus*, *Dipodomys merriami*, *Peromyscus eva*, *Canis latrans*, *Urocyon cinereoargenteus*, and *Procyon lotor*.

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