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Felis catus preying on a *Megasorex gigas*, an endemic and threatened shrew from México

Felis catus depredando a *Megasorex gigas*, musaraña endémica y amenazada de México

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The proliferation of cats (*Felis catus*) has dramatically increased, leading to a worldwide serious conservation issue. In tropical and megadiverse regions, their impact on wildlife has still been poorly documented. The objective of this note was to report a shrew potentially hunted by a cat in Colima, México. On January 30, 2022, we took a recently hunted shrew off a cat at the Centro Universitario de Gestión Ambiental (CEUGEA). We initially detected the predator about 25 m away playing with a prey. We approached the cat and scared it to examine the shrew, which was fresh and had an open wound on one of its flanks. After carefully examining the specimen, we identified it as the Mexican shrew *Megasorex gigas* based on external and cranial characteristics. *Megasorex* is a monotypic genus endemic to western México. It is considered Threatened by the Mexican government and has been determined rare. Cats have been sighted hunting the fauna of CEUGEA, whereas the report of cats hunting shrews has been historically typical in temperate zone countries. In tropical regions, anecdotal records of cats leaving dead shrews in homes are not uncommon. However, there has not been an accurate and formal record of these events that would allow documenting the possible impact of such predators on shrews. We hope that this note might serve to begin a systematization of cat predation records on shrews for enhancing the comprehension of the effect of invasive exotic species on native fauna in megadiverse countries.

Key words: Cat; Colima; exotic fauna; invasive species; predation; Soricidae.

Los gatos (*Felis catus*) han proliferado de forma dramática, generando un serio problema de conservación mundial. En regiones tropicales y megadiversas, su impacto sobre la vida silvestre ha sido pobremente documentado. El objetivo de esta nota fue reportar la captura de una musaraña presuntamente cazada por un gato en Colima, México. En enero 30, 2022, le quitamos una musaraña a un gato en el Centro Universitario de Gestión Ambiental (CEUGEA). Detectamos inicialmente al gato a 25 m mientras jugaba con una presa. Nos aproximamos y lo espantamos para examinar la musaraña, la cual estaba fresca y presentaba una herida en uno de sus flancos. Tras una revisión minuciosa del espécimen, se identificó como musaraña gigante mexicana, *Megasorex gigas*, con base en características externas y craneales. *Megasorex* es un género monotípico endémico del oeste de México. Está considerada como Amenazada por el gobierno mexicano y se le considera rara. Los gatos han sido observados cazando la fauna de CEUGEA, mientras que los reportes de gatos depredando musarañas han sido históricamente típicos en países de zonas templadas. En regiones tropicales, las anécdotas de gatos llevando musarañas a casas no son desconocidas. Sin embargo, no existe un registro preciso ni formal de estos eventos que permita documentar el impacto de estos depredadores sobre las musarañas. Esperamos que esta nota contribuya a iniciar la sistematización de los registros asociados a la depredación de musarañas por gatos para mejorar la comprensión del efecto de especies exóticas invasoras sobre la fauna nativa de países megadiversos.

Palabras clave: Colima; depredación; gato; especie invasora; fauna exótica; Soricidae.

Cats (*Felis catus*) represent a significant threat to wildlife (Trouwborst *et al.* 2020). They are efficient predators of diverse fauna, including invertebrates, birds, reptiles, amphibians, and other mammals (Medina *et al.* 2011). In recent decades, their proliferation worldwide has dramatically increased, leading to a serious conservation issue (Trouwborst *et al.* 2020). For example, cats are the main source of anthropogenic mortality for birds and mammals in the United States of America (Loss *et al.* 2013). Their introduction to islands has become a major concern, as feral populations have contributed to the extinction of endemic species (*e.g.*, indefatigable Galapagos mouse, *Nesoryzomys indefessus*; Darwin's Galápagos mouse, *Nesoryzomys darwini*; little swan Island Hutia, *Geocapromys thoracatus*), whereas huge efforts and resources are required to control those (Medina *et al.* 2011). Moreover, in human settlements, cats are popular pets that menace the city wildlife (Goddard *et al.* 2010). Thus, urgent measures are needed to reduce the negative impacts of cats on the global fauna (Trouwborst *et al.* 2020). In tropical and

megadiverse regions, the impact of cats on wildlife has still been poorly documented (Orduña-Villaseñor *et al.* 2023). Here we aim to report a shrew potentially hunted by a cat in Colima, western México.

On January 30, 2022, we took a recently hunted shrew off a cat at the gardens of the Centro Universitario de Gestión Ambiental (CEUGEA) of the Universidad de Colima. We initially detected the cat about 25 m away playing with a prey. The cat was laying down on the bare ground; it was an adult, grey body colored with a pattern of dark stripes. We approached the cat and scared it to examine the shrew, which was fresh and had an open wound on one of its flanks. CEUGEA is at the Ex-Hacienda Nogueras in the Municipality of Comala, Colima, western México (Figure 1). The site coordinates are 19° 19' 23.041" N, 103° 44' 23.452" W, at 650 m of elevation. The gardens where we took the shrew from the cat mainly included ornamental and medicinal plants; moreover, a small botanical garden was on the site. Remnants of tropical deciduous and sub-deciduous forests, orchards, a human settlement, and agricultural fields were observed in the surrounding areas (González-Alonso 2016). Whether the shrew specimen was hunted in this area or brought by the cat from a more distant place is still being determined.

After carefully examining the shrew specimen, we identified it as a lactating female of the Mexican shrew *Megasorex gigas* (Merriam 1897) based on external and cranial characteristics following Carraway (2007). It had a light gray–lights brown dorsal pelage and visible ears; a considerable total length of 128 mm; head and body of 81 mm long (Figure 2). Skull robust; 3 unicuspids in the upper toothrow and all teeth unpigmented; the area between condylar processes deeply emarginate. We did not include a photograph of the skull as it was severely damaged. The specimen of *M. gigas* is cataloged at the National Mammal Collection (CNMA) at Universidad Nacional Autónoma de México (catalog number: CNMA50346).

Megasorex is a monotypic genus endemic to México and distributed from sea level to 1,800 m west of the country (Woodman *et al.* 2016). It is considered Threatened by the Mexican government (SEMARNAT 2010) and has been determined rare (Armstrong and Jones 1972). The general biology of the species is poorly understood (Guevara *et al.* 2015; Woodman *et al.* 2016). Other shrews recorded in this region of western México are *Cryptotis alticola*, *C. berlandieri*, *Sorex altoensis*, *S. oreopolus*, and *S. saussurei* (Cervantes *et al.* 2008; Guevara *et al.* 2015), with which it can co-exist but can be easily distinguished. Confirming that the cat killed the shrew and did not take it dead from the field is undoubtedly tricky; however, cats have been sighted hunting the fauna of CEUGEA (*e.g.*, green iguana, *Iguana iguana*). Because local people usually provide food for cats in the site, but do not control their movements, we suggest that the cat might be a free-ranging individual, as described by Crowley *et al.* (2020). Further studies within and around CEUGEA might aid to have a more complete comprehension about the

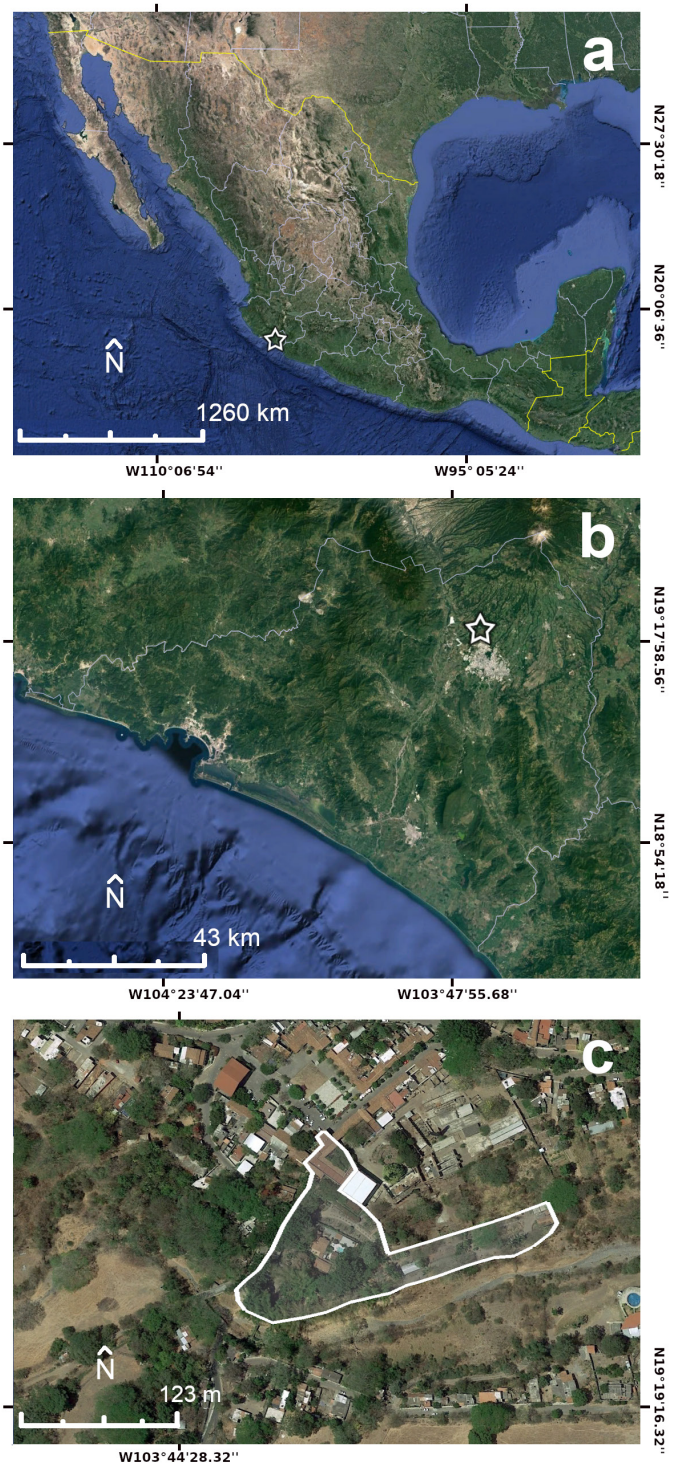

Figure 1. Location where we took *Megasorex gigas* from the cat. The star in the figure depicts a) Colima, western México, b) the location of CEUGEA and c) polygon of CEUGEA at the Ex-Hacienda Nogueras in the Municipality of Comala.

local biodiversity in order to implement actions for its conservation. In this sense, a cat management plan, in which local people participate, should be needed to reduce the negative impact of these animals on other species.

Cats hunting shrews has been historically typical in temperate zone countries (Osgood 1943). It is important to note that these descriptions mention that such felids rarely eat them, presumably because of the shrew's unpleasant

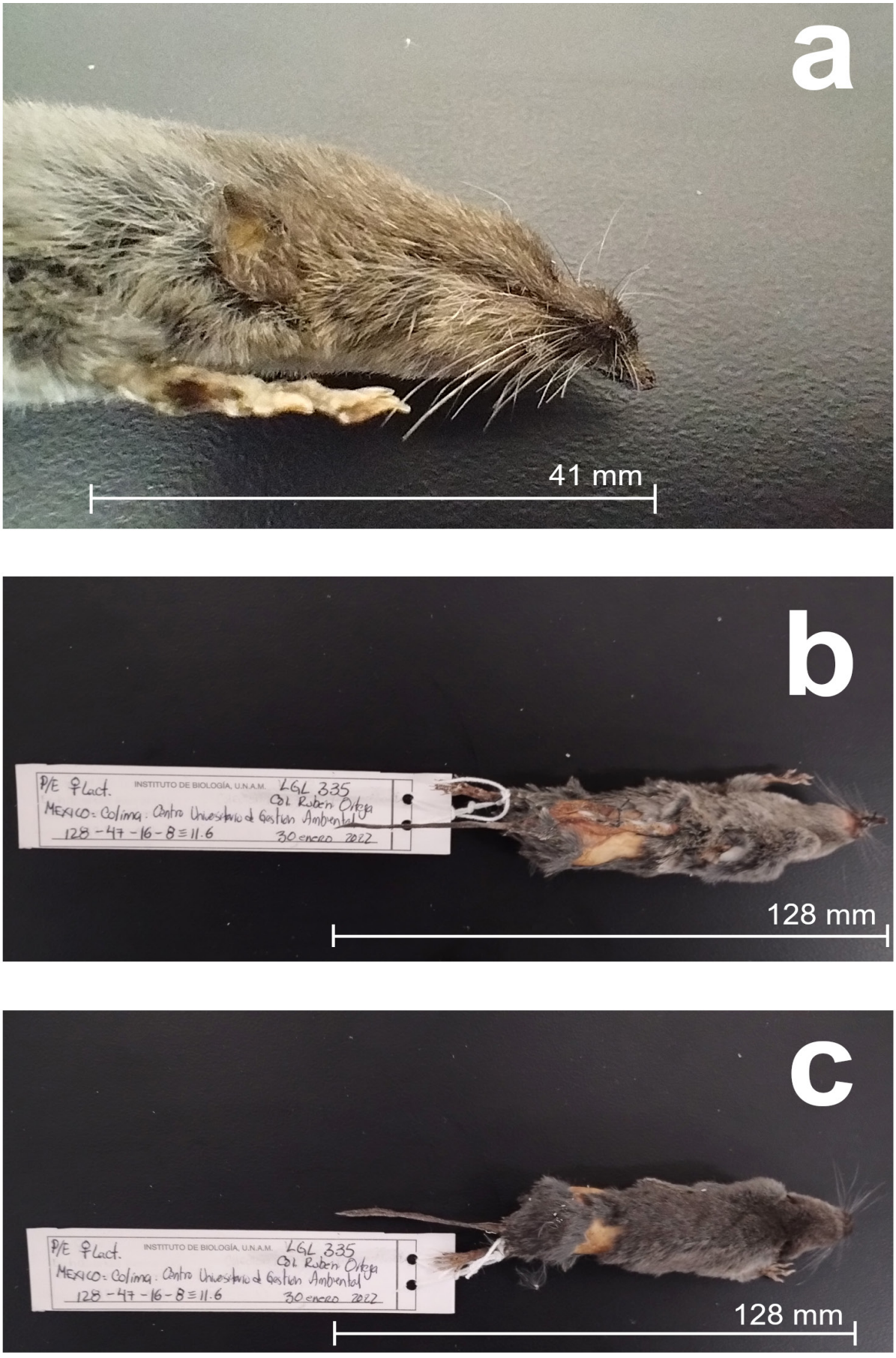

Figure 2. An adult female of *Megasorex gigas* predated by a cat in Colima, western México. Photographs depict a) a lateral view of the head, b) the ventral region, and c) the dorsal region of the specimen deposited at the National Mammal Collection in the Universidad Nacional Autónoma de México (catalog number: CNMA50346).

smell and taste (Osgood 1943; Nagorsen 1996). In tropical regions like México, anecdotal records of cats leaving dead shrews in homes are not uncommon. However, there has not been an accurate and formal record of these events that would allow documenting the possible impact of these predators on shrews, one of the country's poorly known mammals (Guevara *et al.* 2015). We hope that this note might serve as a motivation to begin a systematization of cat predation records on shrews, with the intention of enhancing the comprehension of this particular ecological interaction in megadiverse countries such as México. Documenting and systematizing this type of events might be fostered by including the participation of the general public through citizen science projects, like iNaturalist (https://www.inaturalist.org/).

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