



Two Cases of Tail Bifurcation in Lizards Endemic to Mexico: The Yellow-bellied Gecko, *Phyllodactylus magnus* Taylor 1942, and the Mexican Racerunner, *Aspidoscelis guttatus* (Wiegmann 1834)

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Tail bifurcation is a malformation in which the tail grows a second portion (usually terminating independently) after mechanical damage. Although uncommon, this anomaly has been recorded in a wide variety of reptilian species and other groups (Chávez-Villavicencio and Tabilo-Valdivieso 2017; Hartzell 2017; Koleska et al. 2017; Khandakar and Sultana 2020). Bifurcation occurs most frequently as a consequence of tail loss during a predation attempt, with the lost segment distracting the predator and increasing the likelihood of escape (e.g., Zani 1996; Meyer et al. 2002; Vitt and Caldwell 2014; García-Vinalay 2017). The remaining portion of the tail can regenerate (García-Rosales and Martínez-Coronel 2016), but when the tail is not completely separated, a second section can form (Gogliath et al. 2012; Monte de Andrade et al. 2015; Passos et al. 2016).

In the genus *Aspidoscelis*, reports of bifurcated or supernumerary tails (more than two tails) exist for the species *A. exsanguis*, *A. neomexicana*, *A. uniparens* (Bateman and MacCoubrey 2013), *A. velox* (Cordes and Walker 2013), *A. sexlineata* = *sexlineatus* (Trauth et al. 2014), and *A. tigris*

septentrionalis (Heyborne et al. 2019). However, no formal records of such malformations exist for geckos of the genus *Phyllodactylus*. Herein we report what we believe to be the first records of tail bifurcation in *Aspidoscelis guttatus* and *Phyllodactylus magnus*, the latter of which also is the first record for the genus.

At 1626 h on 21 December 2020, in an urban area surrounded by fragmented low deciduous forest, secondary vegetation, and introduced cattle pastures in “El Ranchito,” Municipality of Santiago Pinotepa Nacional, Oaxaca, Mexico (16.37361 N, 98.16166 W; elev. 245 m asl), we encountered a subadult female *Aspidoscelis guttatus* (Fig. 1) with a bifurcated tail. The new section had developed laterally and was comparable in size to the original tail.

A. guttatus is a diurnal and terrestrial lizard endemic to Mexico that can be found abundantly throughout its distribution in southeastern Mexico, in the states of Veracruz, Morelos, Colima, Michoacán, Guerrero, Oaxaca and Chiapas, at elevations ranging from sea level to 1200 m asl (Duellman and Wellman 1960; Köhler 2008; Uetz et al. 2022). The



Figure 1. A Yellow-bellied Gecko (*Phyllodactylus magnus*) (left) and a Mexican Racerunner (*Aspidoscelis guttatus*) (right) with tail bifurcations. Photographs by Luis Francisco Nieto-Toscano.

specimen appeared to be healthy and fled quickly after being photographed, so the addition of a new tail did not appear to have notably affected the lizard's motility and speed.

At 1324 h on 4 April 2022, we observed a *Phyllodactylus magnus* with a bifurcated tail hiding in the shade at the base of a tree (16.36222 N, 98.17583 W; Fig. 1). Despite being largely nocturnal, we frequently have observed these geckos in the area during the day in the shadows of trees or rocks, where they tend to remain motionless.

P. magnus is a recently elevated species of the subspecies *Phyllodactylus tuberculatus magnus* (Ramírez-Reyes et al. 2021). The known distribution for the species is in the states of Guerrero, Oaxaca and Chiapas along the Pacific coastal plain (Ramírez-Reyes et al. 2021).

These observations are important in generating new knowledge useful to better understand the regeneration phase and the incidence of tail malformations, as well as future research, especially in studies about malformations and tail loss in Mexican lizards, which unlike those carried out with species from Europe, North America and South America, are scarce (García-Rosales and Martínez-Coronel 2016).

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