

Arboreal behaviour in a population of Geniez's wall lizard *Podarcis virescens*

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The wall lizard *Podarcis virescens* Geniez, Sá-Sousa, Guillaume, Cluchier & Crochet (2014) is endemic to central and southern areas of the Iberian Peninsula (Caeiro-Dias et al., 2018; Geniez et al., 2014; Harris & Sá-Sousa, 2002; Kaliontzopoulou et al., 2011). Like many other *Podarcis* species from the *Podarcis hispanicus* complex (Harris & Sá-Sousa, 2002), *Podarcis virescens* have been characterised mainly as having saxicolous habits, both associated with human habitats (villages, bridges, stone walls, etc.) or in more natural habitats with rocky outcrops (Geniez et al., 2014). However, incidental arboreal behaviours have been reported for this species, either basking, hibernating (Malkmus, 2004) or hiding (Vega, 1988). Particularly, Malkmus (2004; see also references therein) reported three cases from 1976 where a single tree, in each case, was used by several individuals for basking, and another case from 2003 where several individuals were observed using also a single cork oak (*Quercus suber*) for hibernation or limited activity during the winter. This last observation was the first one to report the use of a single tree by a *P. virescens* during several consecutive days. Arboreal behaviour has been reported for other species of the *P. hispanicus* complex. Several *Podarcis bocagei* were observed using a number of olive trees (*Olea europea*; Ayres, 2020), eucalyptus (*Eucalyptus globulus*), English oak (*Quercus robur*) and black alder (*Alnus glutinosa*; Galán, 2011) for basking and seeking refuge in north-western Spain. Similar observations were reported for *Podarcis lusitanicus* in the same geographical area (Ayres & Domínguez-Costas, 2021). The authors still refer to this form as *Podarcis gadarramae*, but the observation was reported before the recent validation of *P. lusitanicus* as a species by Caeiro-Dias et al. (2021). Individuals of the Tunisian form of *P. hispanicus* complex (see Kaliontzopoulou et al., 2011 for further information on systematics) were repeatedly observed climbing cork oak or European chestnut (*Castanea sativa*) for basking and feeding or in response to disturbance, in several locations (spanning more than 90 km between the most distant locations) during several consecutive days (Kaliontzopoulou et al., 2009). These observations constituted the first report of extensive arboreality in the *Podarcis* genus (Kaliontzopoulou et al., 2009). Unlike the reported cases in Malkmus (2004), all these observations involved multiple individuals on distinct trees.

On 3rd and 4th March 2007, I observed several *P. virescens* basking on cork oak trunks, below 1 meter height

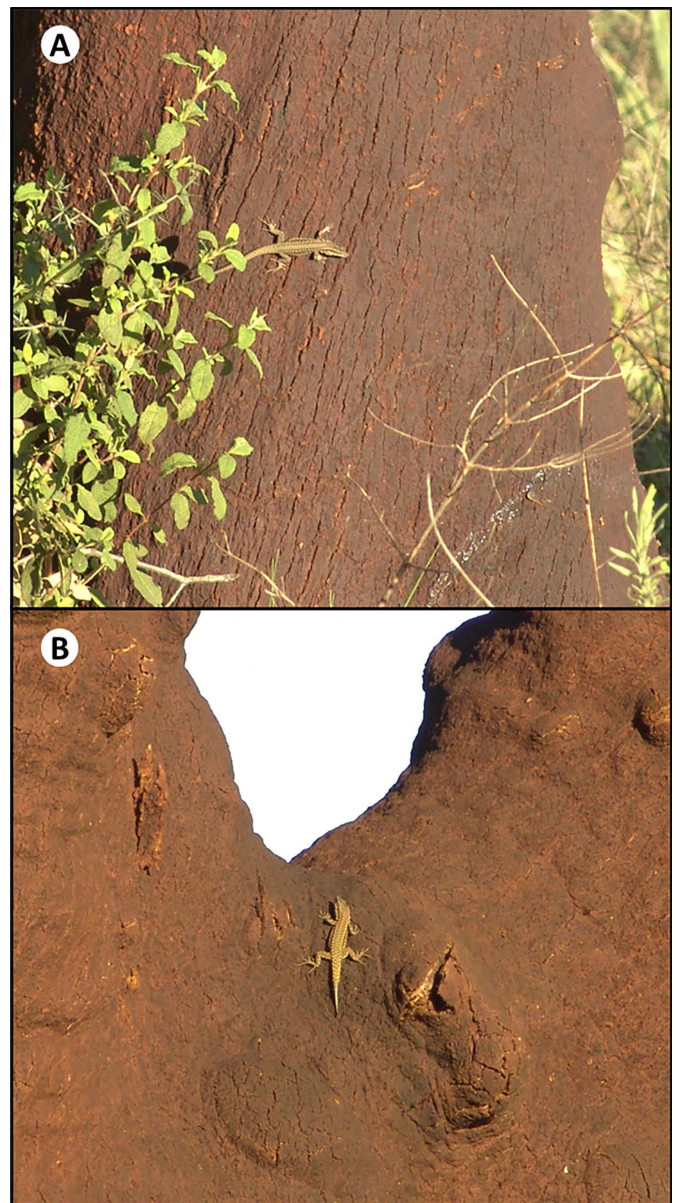


Figure 1. Adults of *Podarcis virescens* on cork oaks (*Quercus suber*) in Mora (Portugal)- **A.** Basking on the lower part of the trunk, and **B.** Climbing a tree, seeking refuge

(Fig. 1A), and/or climbing the trees as a response to my presence (Fig. 1B). These behaviours were observed in the same area (about 64,000 m²) on both days in Mora, Portugal

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(38° 56'13.47" N, 8° 10'44.61" W), by adult males and females. In some cases, the individuals fled from the soil to the trees. When the individuals were on the tree and were approached by me, they climbed to a height approximately between 1 to 2 m, and continued to climb as I got closer, until about 5 to 6 m above the ground when I could not see them anymore. Although scattered observations exist of several *Podarcis* species utilising trees in Iberian Peninsula, it has been reported mainly as incidental. By reporting these observations, I am the first to document an arboreal behaviour of several individuals on several trees, in more than one day and in the same population of *P. virescens* during the active season, contrasting to the previously mentioned hibernation case from Malkmus (2004).

The apparently common arboreal behaviour in the reported population of *P. virescens*, when the observations were made, may reflect microhabitat availability. The observations were made in a Portuguese 'montado' (a traditional human managed wood-pastoral system dominated by more or less sparse *Quercus* spp. trees and a mosaic of bush coverage), where rocky outcrops or stony refuges were non-existent. Also in this area, two other lacertid species, the spiny-footed lizard *Acanthodactylus erythrurus* and the Algerian sand racer *Psammotromus algirus*, were frequently detected during these two days. Both lizard species grow to be larger than *P. virescens* and used the ground as basking sites, and bushes or holes in the soil as refuges, and thus could be important competitors reducing ground basking opportunities for *P. virescens*. Although these observations are 14 years old, they were not previously published or reported, but are still important, since to date only the observations on Tunisian form reported by Kalintzopoulou et al. (2009) shows extensive arboreal behaviour in the *P. hispanicus* complex. Kalintzopoulou et al. (2009) also stated that "we have never observed its (the Iberian species from the *P. hispanicus* complex) regular use of trees in the Iberian Peninsula, even though oaks and other large trees are often available." However, it is possible that the arboreal behaviour may be more common in some *P. virescens* populations than reported in the literature, which deserves further investigation, particularly in this region of Portugal. Two of the cases reported in Malkmus (2004) were observed in Ponte de Sôr and Fóros do Arrão, which are relatively close to the population reported here (about 38 km to north and 23 km to north-west, respectively).

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