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# Understanding patterns of micro-endemism in chameleons: case of *Furcifer nicosiai* (Reptilia, Chamaeleonidae) in the western dry forest of Madagascar

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## Abstract

In Madagascar, although chameleons in the genus *Furcifer* are considered as generalists and widely distributed, a few species occur in small geographic areas. Factors leading to such micro-endemism have been studied for the genus *Brookesia* but not for *Furcifer*. This study is an attempt to understand the distribution pattern of an endangered and micro-endemic species, *Furcifer nicosiai*, in the dry forests of western central Madagascar. Available literature about this species, including its distribution, ecology and phylogenetic relationships with other members of the genus, was reviewed. Additional ecological data on habitat and perch use were collected in the regional forests. The species is currently known in the protected areas of Bemaraha and Menabe Antimena. The results indicate that climate is a major factor influencing the distribution of *F. nicosiai* rather than soil substrate. This species is unknown beyond the northern part of Bemaraha, where there is increased humidity, or below the southern portions of the Menabe Antimena forests, where there is a decrease in rainfall. Even though Bemaraha and Menabe Antimena are separated by two major rivers (Manambolo and Tsiribina), these potential barriers have not limited dispersal. Based on preliminary survey data, *F. nicosiai* is unknown to occur in the Masoarivo forest blocks between the Manambolo and Tsirabihina Rivers. Two hypotheses can be advanced: 1) during a period of range expansion, *F. nicosiai* only used the region of the existing Masoarivo forest as a dispersal corridor without establishing a population in this area or 2) the local Masoarivo population was subsequently extirpated associated with human-induced degradation of this forested zone. Further, the habitat and perch use of *F. nicosiai* showed a preference for more open forested habitats in largely intact areas, with trees and shrubs of less than 8 m high and 2.5 cm dbh. As these results highlight the apparent specificity of this species regarding microclimate and presumably habitat loss, conservation actions need to be reinforced in the area containing the known distribution of this species. Moreover, additional fieldwork needs to be conducted in the relict Masoarivo forests to verify its absence from this zone.

**Keywords:** Bemaraha, dispersal, *Furcifer nicosiai*, Menabe Antimena, protected areas

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