

Overview of Pronk's day gecko *Phelsuma pronki* (Seipp, 1994) (Reptilia Gekkonidae) from Mangabe protected area, eastern Madagascar

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ABSTRACT

We surveyed Pronk's day gecko *Phelsuma pronki* (Seipp, 1994) (Reptilia Gekkonidae) from three sites within Mangabe protected area. Sites were chosen according to their location and altitude. Fieldwork was done in October-November 2018 when the animal is very active. Thirty transect lines were surveyed, ten for each site. One transect measure 200 m and distance between transects should be 50 m at least to avoid pseudo-replication on transect location. In total, we encountered 31 individuals, 18 of them were found from Analamay forest. The species was found mostly on dead trees from an open area inside of primary forest.

KEY WORDS

Conservation; Habitat; Mangabe; *Phelsuma pronki*; Population; size.

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INTRODUCTION

The genus *Phelsuma* Gray, 1825 (Reptilia Gekkonidae) is a group of day geckos with splendid colourations that is mainly distributed on the islands in the western Indian Ocean (Glaw & Rosler, 2015). Madagascar is home of 35 species (Uetz & Hošek, 2014) and some papers indicated that the genus *Phelsuma* probably originated in Madagascar and subsequently dispersed and radiated in the other Indian Ocean archipelagos, with a different colonisation history on each island group (Austin et al., 2004; Harmon et al., 2008; Rocha et al., 2009, 2010). The last red list assessment classified 12 species, and of these about 1/3 of Malagasy *Phelsuma* are threatened and four of them were listed Critically Endangered. Regardless of their IUCN Red List status all *Phelsuma* species are listed on the CITES Appendix II (Glaw & Rosler, 2015).

Phelsuma pronki (Seipp, 1994) is endemic to Madagascar and occurs in isolated fragments in the eastern rainforest bordering the central highlands of Madagascar, in the Andramasina region, Anjozorobe reserve and in the Ambatovy area. It is one of the Critically Endangered species because of its extent of occurrence is estimated less than 100 km². It only persists in severely fragmented forest habitat, which is still being degraded by human pressures such as habitat loss occurring within this species' range and harvesting for the international pet trade. Populations of this species have declined over the past years (Raxworthy & Vences, 2010). Few individuals of the species were found from Mangabe protected area in 2014 (Bower et al., 2014). This study aims to collect more information on Pronk's day gecko within the protected area such as its distribution, population size and habitat preferences for the benefit of its conservation.

MATERIAL AND METHODS

Field work was done within Mangabe-Ranomena-Sahasarotra reserve which is situated in southwestern of Moramanga between Latitude S19°00 and S19°28 and Longitude E48°05 and E48°25 with an altitude range between 800 to 1300 meters (Madagasikara Voakajy, 2015). It is included in the east at mid-altitude bioclimatic zone described by **Du Puy & Moat (1996)**. The vegetation is dominated by evergreen humid forest characterized by high canopy and closed forest. We selected three camp sites within the protected area which have been chosen according to their biogeography and the altitude range. The first camp was Ampahatra situated in the north of the protected area with low altitude range between 943–990 m. The second camp was Lakambato in the middle with an altitude between 989 to 1039 meters. The last camp was Analamay situated so far in the south with an altitudinal range between 996 to 1089 meters (Fig. 1).

We surveyed Pronk's day gecko along 10 transects of 200 m from each camp site. Transects were installed in different types of habitat such as forest

edge, interior of the forest following the top, and degraded area outside of the forest with dead trees. Each transect was visited three times: twice in the morning between 7h00 to 11h30 and once in the afternoon between 13h00 to 15h00; towards these hours, the geckos are more active and easier to find. The survey was done by four people composed of one specialist and three trained guides who knew the species and the area of interest. For each observation, we collected data on: animal height from the ground, total tree height, life status of the tree, activity of the animal at its first observation, GPS coordinates. We calculated the kilometric abundance index (KAI) following the formula adapted from Preatoni et al. (2012).

$$\text{KAI} = \frac{\text{Number of presence sightings}}{\text{Transect length covered (m)}} * 1\text{km}$$

RESULTS AND DISCUSSIONS

In total, we encountered 31 individuals with 25 observed along transects and 6 incidentally ob-

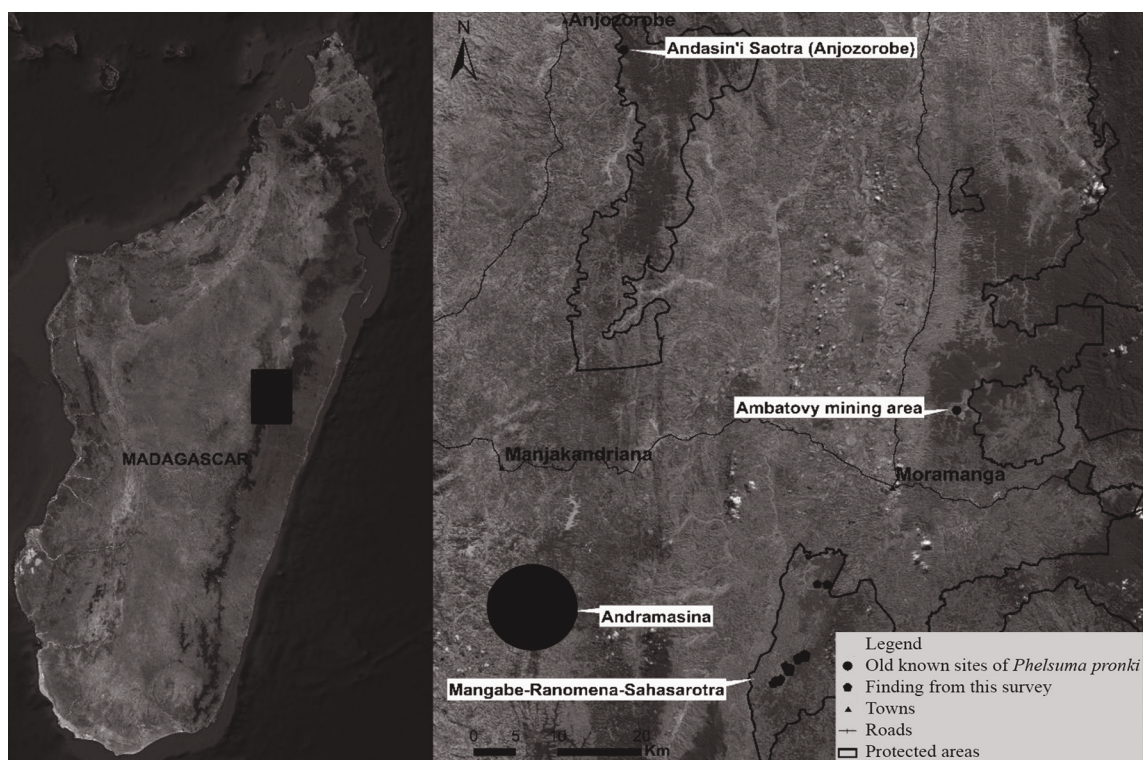


Figure 1. Map showing study sites and Pronk's day gecko distribution in Madagascar.

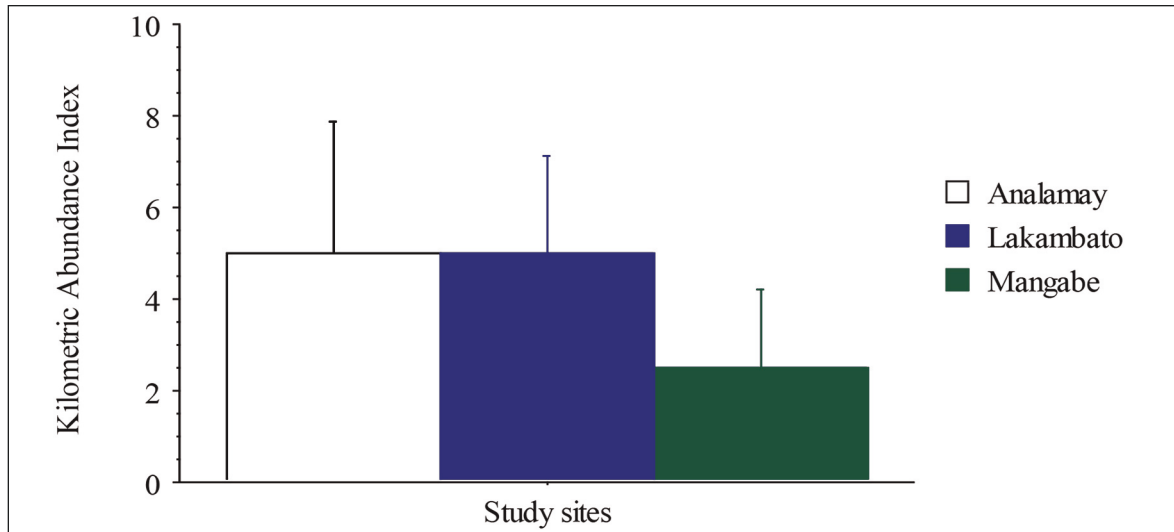


Figure 2. Kilometric abundance index (KAI) per site.

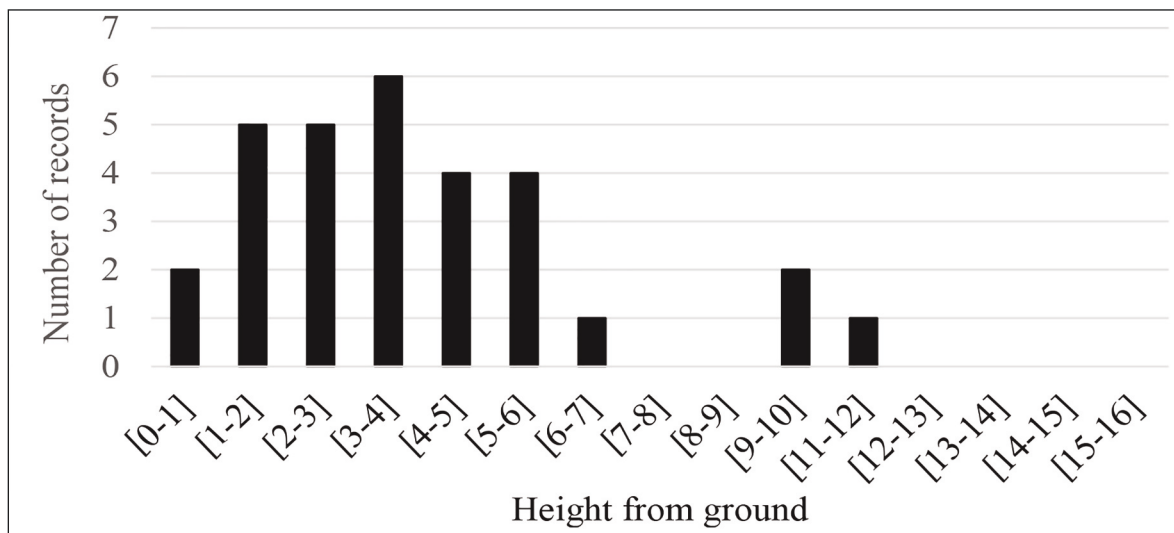


Figure 3. Frequency of roosting height.

served along the road. Abundance index changes between sites, as Analamay and Lakambato had the same abundance of 5 ind.km⁻¹, in contrary to Ampahatra site with 2.5 ind.km⁻¹ (Fig. 2). However, this difference is not significant (p-value=0.53). All the six incidental observations were found in Analamay forest. Twenty-eight of the individuals were adult and we found gravid female during the survey. Pronk's day gecko was found mostly in dead tree but we found two individuals on living trees one in Ankolokoloka forest in Lakambato site and the other

one from Analamay. Most individuals were observed by themselves, with the exception of four cases in which two couples were found in one tree in Analamay and Lakambato. This study confirms the presence of Pronk's day gecko within Mangabe protected area situated about 30 km east of Andramasina and can be considered as a range extension in addition to its actual range during its conservation status assessment. This site is actually protected but threats still exist there which can affect the species such as slash-and-burn agriculture and illegal collection. Despite



Figure 4. Number of dead and living trees from the areas with and without animals.

this range extension, the species still under threat can be considered as Critically Endangered according to A1 criteria (IUCN, 2001. A: population size reduction; 1: if the reasons for population reduction no longer occur and can be reserved, the population needs to have been reduced by at least 90%).

The species was found from 0.5 to ten meters above ground, with 24 of them between one to six meters (Fig. 3). *Phelsuma pronki* prefers big dead trees easily exposed to the sun early in the morning and late in the afternoon. They were all found on the main trunk in the middle of the tree. At their first observation, only four individual were actively running or searching food.

During this survey, we found the animal from areas where dead trees were abundant but with less disturbance (Fig. 4). All individuals were observed on trees which confirm Seipp's statement that the species is arboreal and is known to be from humid rainforests (Seipp, 1994). Most of the individuals were found on dead trees, in accordance also with Raxworthy & Vences' (2010) statement that the species appears to live mainly on dead trees within rainforest.

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