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SHORT COMMUNICATION

THE ONCILLA *LEOPARDUS TIGRINUS ONCILLA* (SCHREBER, 1775): REPORTING ITS OCCURRENCE AT CHUCANTÍ PRIVATE NATURAL RESERVE, DARIEN, PANAMA

LA ONCILLA *LEOPARDUS TIGRINUS ONCILLA* (SCHREBER, 1775): REPORTANDO SU PRESENCIA EN LA RESERVA NATURAL PRIVADA CHUCANTÍ, DARIEN, PANAMÁ

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ABSTRACT

This study reports the occurrence of *Leopardus tigrinus oncilla* from eastern Panama. This is only the third such report of its presence across Panama, which expands the known distribution of this species to nearly the entire country. The presence of *L. t. oncilla* in Chucantí Private Natural Reserve confirms the importance of the Darien cloud forest for the conservation of this elusive felid.

KEYWORDS

Mammals, Cloud forest, Northern tiger cat, Darien, Panama, Central America

RESUMEN

Este estudio reporta la ocurrencia de *Leopardus tigrinus oncilla* en el este de Panamá. Este es el tercer informe de su presencia en Panamá, lo que amplía la distribución conocida de esta especie a casi todo el país. La presencia de *L. t. oncilla* en la Reserva Natural Privada Chucantí confirma la importancia del bosque nuboso del Darién para la conservación de este evasivo felino.

PALABRAS CLAVES

Mamíferos, Bosque nuboso, Gato tigre del norte, Darién, Panamá, América Central

INTRODUCTION

The oncilla also called "northern tiger cat" (*Leopardus tigrinus oncilla*) is a little known and poorly studied felid subspecies from Central America, only reported on two sites in Panama (de Oliveira *et al*., 2020; Meyer *et al*., 2015; Rodgers & Kapheim, 2017). It is currently considered Vulnerable (VU) according to the latest IUCN Red List assessment (Payan & Oliveira, 2016; Pineda-Guerrero, 2018). This felid used to be considered a single unique subspecies until genetic studies split them between *L. t. oncilla* (Northern tiger cat) and *L. gutulus* (Southern tiger cat) (O'Brien & Koepfli, 2013; Payan & Oliveira, 2016). This northern subspecies has been reported from Costa Rica (3,625 m a.s.l.), Panama (3,475 m a.s.l.), and Colombia (4,800 m a.s.l.), confirming a preference for cloud forest (de Oliveira *et al*., 2008; Pineda-Guerrero, 2018; Rodgers & Kapheim, 2017; Rogan, 2021). In Panama, it has been genetically detected via scat from Chiriqui highlands, Barú Volcano National Park (Rodgers & Kapheim, 2017), and via camera traps studies from Darien National Park (Meyer *et al*., 2015). Despite several biodiversity studies throughout the country, including the Panama Canal Watershed (Méndez-Carvajal, 2012), Cerro Hoya National Park (Fort *et al*., 2014), El Montuoso Forest Reserve (Méndez-Carvajal *et al*., 2020), Central Panama (Meyer *et al*., 2015), and southeastern Darien (Méndez-Carvajal *et al*., 2021), where the oncilla have not been detected. Although it has been difficult to assess *L. t. oncilla* due to its cryptic behaviour, some population densities have been published, encouraging additional studies to better understand the species' conservation status, distribution, and threats (de Oliveira *et al*., 2020). In this study, we evaluate the presence of *L. t. oncilla* in Darien-Panama at the Chucantí Private Natural Reserve (CPNR), considered a hotspot for endemism and diversity.

METHODS

Study area

The Chucantí Private Nature Reserve (CPNR; N 08°47′16", W 078°27′01") is located in the Darién province, Republic of Panama (Laurance, 2008). The average temperature falls between 24.0-27.2 ºC, with approximately 1,940.5 mm of precipitation annually (Gutiérrez-Pineda *et al*., 2021). The site is a mixture of montane and submontane forest (Méndez-

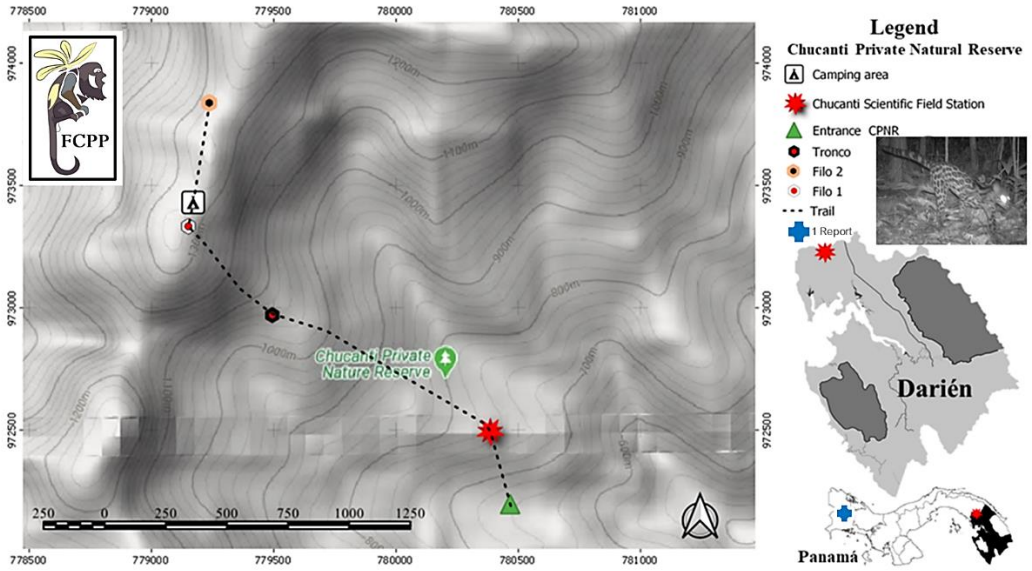
Carvajal, 2012). It has a high degree of plant diversity and endemism, largely dominated by the families Rosaceae, Magnoliaceae, Gentianaceae and Fabaceae (Ortiz *et al*., 2016; Flores *et al*., 2017; Mijango-Ramos *et al*., 2020) (Fig. 1). This study was carried out under scientific permission No. SE/A-53-18 and ARB-0028-2021.

Data collection for terrestrial mammals

Data were generated by a long-term monitoring project that utilized three camera traps (Cuddeback and Bushnell Trophy Cam models) at the ground-level of the forest, which operated from December 2012 to May 2014 (Méndez-Carvajal in prep.). Camera traps were positioned along the first two kilometers of the trail on the left-hand side. The cameras were located as follows: station 1 "Tronco" (800 m.a.s.l; N 08º47'36.69" W 78º27'33"), station 2 "Filo 1" and station 3 "Filo 2" (1,375 m.a.s.l; N 08º48' 05.01" or W 78º27'42.038"). The cameras were spaced 1 km apart along the 3 km trail (Gutiérrez-Pineda *et al*., 2021) (Figure. 1).

Figure 1.

Map of the study area and location of Chucantí Private Nature Reserve, Agua Fría, Chepigana, Darién province, Republic of Panama.



Data analysis

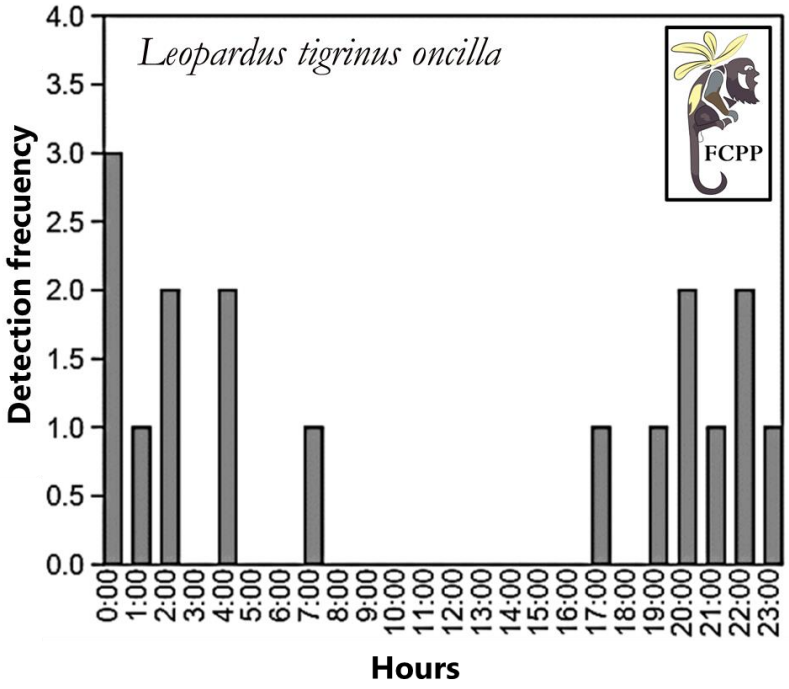
We calculated the frequency of detection of the number of species per month. Having acquired more than 11 photographic events with intervals ≥30 min apart, we were able to generate circadian activity graphs (Mosquera-Muñoz, 2014). All statistics were analyzed using PALeontological STatistics software (PAST 4.02).

RESULTS

We detected *Leopardus tigrinus oncilla* between 19 terrestrial mammal species across 38, 592 trapnight/hours. Particularly, *L. t. oncilla* appeared at the three sites sampled (Tronco,

Filo1 and Filo 2) from 800 to 1,375 m.a.s.l. in the cloud forest. *L. t. oncilla* appeared to be mostly active between 17:00 to 04:00, confirming a marked nocturnal activity (Table 1).

Figure 2.
Circadian activity of L. t. oncilla at Chucanti Private Natural Reserve, Agua Fría, Chepigana, Darien, Republic of Panama.



Identification of *L. t. oncilla* was based on tail position, orbital distance between eyes, small body size compared at the same position using a natural reference for different felines photographed at the same station, frontal extension between ears and eyes are short (Figure 3). IDs were confirmed by Tadeu de Oliveira, a specialist on this taxon.

Figure 3.
Photo-capture of L. t. oncilla at Chucanti Private Natural Reserve, Darien province, Panama.

DISCUSSION

This study reports the eastern-most distribution for *L. t. oncilla* in Panama. This species may have been missed on previous mammal diversity studies, possibly due to short study periods and reduced effort within the central provinces of Panama, as noted by Fort *et al.* (2014). Updating biogeographical information helps improve distribution knowledge and identify potential conservation areas as priorities (Loyola *et al*., 2008; Méndez-Carvajal *et al*., 2021). Our results showed that *L. t. oncilla* is sympatric with five other wild feline species as *Panthera onca*, *Puma concolor*, *Leopardus pardalis*, *Leopardus wiedii*, and *Herpailurus yagouaroundi* in Chucanti, making this area a unique zone in Panama. Furthermore, due to this high felid sympatry, this is one of the few areas in *L. t. oncilla*`s entire distribution where such an interspecific ecological niche study could be undertaken. Chucanti Private Natural Reserve is an ideal place to examine ecological problems related to the co-existence of species with similar morphological adaptations and diet (Tokeshi, 2009). The number of prey species at Chucanti are well defined for big cats such as *Panthera onca* and *Puma concolor*, which also made few appearances on our camera traps over two consecutive years. In fact, these large cats were captured less than their regular prey, including *Cuniculus paca*, *Mazama temama*, *Odocoileus virginianus*, *Pecari tajacu*, and *Crax rubra*, as reported in Darien by Arosemena (2017) and Moreno (2006).

Interestingly, *L. t. oncilla* may maintain a different activity pattern compared to sympatric margay (*L. wiedii*) and ocelots (*L. pardalis*). According to the principle of intraguild predation proposed in Polis *et al*. (1989), the felids of Chucanti could be segregating themselves by habitat, where small felids are expected to have smaller ranges and large cats increase their habitat range, as reported for de Oliveira & Pereira (2014). It is important to note that there are reports of social predators such as coyotes (*Canis latrans*) near Chucanti (Bermúdez *et al*., 2012), though we did not detect this species within the main reserve possibly due to the presence of a *P. onca* and *P. concolor*. Social predators, such as coyotes, tend to put more pressure on small mammals in habitats where they dominate, impacting mammal diversity. The *L. t. oncilla* are considered victims of intraguild predators, and for areas fragmented or with human presence, pressures may increase if hunting dogs, and feral cats are nearby. In Chucanti, hunting dogs were detected on the same trails, while there has also been evidence of domestic cats infected with *Ricketssia felis* around the scientific station, which could lead to zoonotic disease transmission and threaten wildlife populations (Bermúdez *et al*., 2012; Vieira *et al*., 2018).

CONCLUSION

This study confirmed the presence of one of the least known Neotropical felid species in eastern Panama. The presence of *L. t. oncilla* in the area between Chiriquí to Darien, supports the potential for this species having a broader distribution in Panama. This study also supports Chucanti Private Natural Reserve as an important site to study the effects of sympatric felines on mammal populations as it is the only known habitat in Panama with six feline species. Although previously reported from other habitats, both hunting pressure and the presence of domestic canids and felines can cause threaten population stability. Finally, our study reinforces the importance of long-term biodiversity monitoring for expanding our understanding of cryptic and elusive species with low densities across landscapes.

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