PRELIMINARY OBSERVATIONS OF THE ENDANGERED BINTAN PALE-THIGHED LANGUR *Presbytis siamensis rhionis*

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ABSTRACT

The Bintan Pale-thighed Langur (*Presbytis siamensis rhionis*) is an Endangered colobine primate endemic to the island of Bintan, Indonesia. Currently, there is a dearth of available information regarding this taxon, as no studies have been published in scientific literature. The objective of this study is to address this knowledge gap by presenting observational data obtained during a four-day rapid field survey conducted in November 2022, as well as by consolidating anecdotal reports provided by residents. Our findings encompass details pertaining to the langur's distribution, group size and composition, behaviour, as well as a list of recorded food plant species. Furthermore, we describe the various threats faced by *P. s. rhionis* and propose essential conservation measures.

Keywords: Bintan, conservation, endemic primate, *Presbytis*, wildlife tourism

INTRODUCTION

The Bintan Pale-thighed Langur, *Presbytis siamensis rhionis* (Miller, 1903) is an endemic primate found exclusively on Bintan Island, Indonesia. This taxon is currently facing the threat of extinction due to its limited distribution. It is thought to be confined to Bintan Island, although it may also occur on the neighbouring islands of Batam and Galang (Roos et al., 2014). The extensive loss of habitat resulting from economic and tourism development on these islands poses a significant risk to the survival of the remaining populations of *P. s. rhionis*.

Preliminary genetic data indicates that one or more subspecies of *P. siamensis* may warrant recognition as separate species; further genetic and field studies are needed to clarify their taxonomy and distributions (Ang et al., 2020). Currently classified as Endangered on the IUCN Red List, the conservation status of *P. s. rhionis* may require a re-assessment if elevated to species level (Ang & Traeholt, 2020).

Despite the importance of gathering information on *P. s. rhionis*, there is a lack of data on its distribution, population size, ecology, behaviour, taxonomy, and genetics. Furthermore, as this taxon has not yet been designated as protected by the Ministry of Environment and Forestry in Indonesia, no specific conservation measures have been implemented. Therefore, our aim is to contribute field observations for *P. s. rhionis* on Bintan Island and draw attention to the urgent conservation concerns that need to be addressed.

METHODS

Field observations were conducted in three different forest types in the Bintan Resorts, Lagoi tourism area of Bintan Island: mangroves, secondary lowland rainforest, and a mix of secondary and primary rainforest on Gunung Bintan Besar. It should be noted that while primary forest was part of the surveyed areas on Gunung Bintan, this specific habitat type was not explicitly categorized as a distinct forest type in the methodology. The observations spanned four days in November 2022, totalling 12 hours. The surveys

utilized various methods, including nine hours on foot, one hour from within a vehicle, and two hours on a boat to cover different areas of northern Bintan as quickly as possible within the limited time available to the observers.

During the observations, any sighting of *P. s. rhionis* was meticulously documented, capturing details such as the date and time, GPS location, group size, age class composition and feeding behaviour, including plant species and parts. *Presbytis s. rhionis* individuals were classified into three age classes by size: adults/subadults, juveniles and infants. Subadults were unable to be discerned from adults by the observers in most cases. Furthermore, any interactions with other primates were noted.

Moreover, supplementary information and data collected opportunistically from 2021 to 2022 were collated. This information was obtained through spontaneous observations of langurs by the authors or from conversations with local residents and included images and videos of *P. s. rhionis* sightings or incidents involving roadkill, generously contributed by members of the public, including photographers and residents.

RESULTS

The observations recorded during the survey are provided in Table 1 with accompanying images and maps in Figure 1.

Habitat and Distribution

Individuals of *P. s. rhionis* were observed in lowland secondary forests, mangrove forests, and coastal forested areas. Currently, there is no evidence of their presence in primary rainforest. However, this could be due to the limited coverage of primary forests in Bintan because of deforestation. Some groups of *P. s. rhionis* seem to tolerate human presence and have been frequently observed by local residents and the observers near school buildings, dormitories, golf courses, and main roads.

Most sightings of *P. s. rhionis* were from the northwestern part of the island, particularly in the Bintan Resorts and Lagoi area which are part of Teluk Sebong district. This is primarily because survey efforts have been focused there. Sightings in other areas of Teluk Sebong district, namely, Pengudang, Jago, and Ekang were also reported by local residents and observers. So far, no sightings have been recorded in the southern half of the island, possibly due to higher levels of forest clearance and development in that area. In addition to observations of *P. s. rhionis* in their natural habitat, a few cases of roadkill have been documented.

Diet

Eight food plant species were identified through visual observation and anecdotal reports. In secondary forest areas, langurs predominantly consumed native species in addition to naturalized and cultivated plants like *Manihot esculenta* (Crantz) and *Adenanthera pavonina* (L.). In mangrove areas, they were observed to feed on mangrove species such as *Xylocarpus granatum* (J. Koenig) and *Rhizophora apiculata* (Blume).

Group Size

The estimated group size ranges from 4 to 8 individuals. Smaller groups consist only of adults or subadult males. In contrast, larger groups frequently include infants and juveniles, which suggests the existence of a breeding population.

DISCUSSION

Our preliminary observations provide valuable insights into the group dynamics and diet of *P. s. rhionis*. Like other *Presbytis* taxa, *P. s. rhionis* consumes fruits, flowers, and leaves. For instance, they consume the fruit of *Adinandra dumosa* S. Vidal but not the leaves or flowers of this plant. Additionally, they demonstrate adaptability by consuming several non-native plant species in addition to those native to Bintan. The presence of infants among many of the observed troops indicates that the population is reproducing.

The primary threat to *P. s. rhionis* is habitat loss. The loss of primary forest on Bintan Island began as early as the 1700s with the establishment of gambier plantations and the timber trade, which continued until the 1970s. Deforestation remains an ongoing issue due to illegal logging, encroachment, mining, oil palm and rubber plantations, charcoal trade, and housing developments in the southern part of the island, where the majority of the human population resides (Subiakto & Rahmat, 2015). According to analyses from the UN Biodiversity Lab, Bintan Island has experienced a tree cover loss of 274 km², which accounts for 19.61% of its total tree cover, between 2001 and 2020. This loss not only results in the obvious loss of habitat for Bintan's wildlife but also contributes to issues such as poor soil fertility and increased soil erosion.

Fig. 1. *Presbytis siamensis rhionis* feeding (A); *P. s. rhionis* female with infant (B), *P. s. rhionis* in mangroves (C). *P. s. rhionis* crossing a stretch of road (D), and documented road accidents (E-G).

Currently, the forested area of Bintan Island consists mainly of secondary forest interspersed with some old-growth dipterocarp forests, blackwater peat swamp forests, and mangrove forests along rivers (Vegara, 2011). These forests are predominantly located in the northern half of Bintan Island. While most of the primary forests have been cleared, there are still a few remaining patches of old-growth forests on the island, primarily on Gunung Bintan Besar, which were spared from extensive deforestation due to their hilly terrain.

As a result, the northern half of the island, managed for tourism development by Bintan Resorts, plays a crucial role in the conservation of native wildlife, including *P. s. rhionis*. Langurs, like most *Presbytis* taxa, are arboreal and highly folivorous, requiring forested areas with dense canopy cover for movement, foraging, and protection from human activities and predators. Conserving their habitat will ensure that these primates have access to sufficient territory and food sources. In addition to conserving these forested areas, ensuring sufficient connectivity between the forest patches is essential to permit migration between groups and preserve the genetic diversity of the overall *P. s. rhionis* population. Therefore, the development of

Table 1. Date and time of sightings of *Presbytis siamensis rhionis*, group composition, and consumed food plant species on Bintan island with native status.

Location (District)	Date and Time	No. of individuals	Remarks	Food Plant species	Native Status
Banyan tree resorts	18/3/2021 17:00 – 18:00	4	3 adults/subadults, 1 infant (eating)	*Durio* sp.	Non-native
Fire Fighter Office	7/4/2021 17:00 – 18:00	6	4 adults/subadults, 1 juvenile, 1 infant (playing & grooming)	-	-
Ria Bintan	23/4/2021 17:00 – 18:00	2 groups in different locations <10	Loc. 1: <10 adults Loc. 2: 1 adult, 1 infant, 3 juveniles (sitting on the road)	-	-
Politeknik Bintan Cakrawala	3/5/2021 17:00 – 18:00	1	1 adult	-	-
Politeknik Bintan Cakrawala	23/6/2021	<10	Adults/subadults & juveniles (eating)	*Adenanthera pavonina* L.	Non-native
Indorent	24/11/2022 17:35	8	7 adults/subadults, 1 infant (eating)	*Adinandra dumosa* S.Vidal	Native
				Manihot esculenta Crantz	Non-native
Cassia Golf Court	25/11/2022 08:09	1	Juvenile male (eating)	*Syzygium grande* (Wight) Walp	Native
Ria Bintan	25/11/2022 11:15	4	3 adults/subadults, 1 large infant (suspected sleeping tree; heavy urine smell, seen here multiple times)	-	
Sebong River Mangrove	25/11/2022	3	3 adults/subadults (possibly bachelor group)	*Rhizophora apiculata* Blume	Native
Politeknik Bintan Cakrawala	25/11/2022 18:05	5	3 adults/subadults, 1 juvenile, 1 infant (eating)	*Adenanthera pavonina* L.	Non-native
Lagoi, Township	27/11/2022 16:00	1	1 juvenile	*Mangifera indica* L.	Non-native

a conservation action plan centred around providing alternative livelihoods to local communities and economic incentives to conserve the langurs with support from researchers, government agencies, and Bintan Resorts, is imperative.

Another perceivable threat to *P. s. rhionis* are road accidents, and there have been numerous documented incidents of roadkill involving this subspecies. Three separate incidents resulting in the death or injury of langurs due to collisions with vehicles were recorded as of November 2022, with many more since. Additionally, there has been a sighting of langurs descending from the trees onto a nearby road to cross over into another forest patch. This behaviour suggests that langurs are utilizing roads to cross into adjacent forest patches, indicating that forest fragmentation and the presence of roads adjacent to forested areas pose a threat to the survival of the langurs. This issue can be addressed by identifying roadkill or langur crossing hotspots and implementing measures such as the installation of rope bridges for langurs to use (Ow et

al., 2022). Moreover, signage to alert drivers to slow down or the enforcement of speed limits in these areas can also help mitigate the issue.

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