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Interactions between a wild Bornean orang-utan and a Philippine slow loris in a peat-swamp forest

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Abstract All documented orang-utan–loris interactions have been from Sumatra, where lorises were opportunistically preyed upon by orang-utans. In this paper, we describe two accounts of the Bornean orang-utan (*Pongo pygmaeus wurmbii*) interacting with the Philippine slow loris (*Nycticebus menagensis*). The interactions were by two adolescent female orang-utans. No attempts to catch the loris were observed on either occasion. Neither interaction was hostile. During the second observation, which was more detailed, we considered the behaviour to be play rather than aggression or attempted predation. Based upon the lack of interest from the adult females during these rare encounters, we propose that the behaviour represents play or non-aggressive exploration rather than predation.

Keywords Slow loris · Orang-utan · Predation

Introduction

Orang-utans (*Pongo* spp) share the forest canopy with many other arboreal species with separate niches, but there is still competition for resources. Seasonal fluctuations can also alter activity patterns. Orang-utans in the Sabangau peat-swamp forest in Central Kalimantan, Indonesian Borneo, have been observed to share feeding trees with other primates, including gibbons (*Hylobates albobarbis*) and pig-tailed macaques (*Macaca nemestriana*, HMB pers. obs.). In some encounters there was no interaction, but others were more antagonistic, with the orang-utan sometimes chasing the other species away.

Orang-utans have an extremely diverse and adaptable diet compared to many other primates (Ungar 1995; Russon et al. 2009). They are mainly frugivorous (MacKinnon 1974; Rodman 1977a), but their diet also includes flowers, leaves, pith, bark, insects and bird eggs (MacKinnon 1974; Rodman 1977b; Galdikas 1988; Knott 1999). In some cases they have even been observed to eat small vertebrates (Sugardjito and Nurhada 1981; Utami and van Hooff 1997; Hardus et al. 2012). Therefore, some authors describe orang-utans as an opportunistic forager rather than a true frugivore (McConkey 2005), as their diet changes in relation to what is available. In the rare accounts of when orang-utans were observed to add meat to their diet, the prey was usually found opportunistically or scavenged (Buckley et al. 2014; Hardus et al. 2012).

All published cases of orang-utan (*Pongo abelli*) and slow loris (*Nycticebus coucang*) interactions come from Sumatra and have resulted in the orang-utan eating the loris (Utami and van Hooff 1997; Hardus et al. 2012). Sumatran orang-utans occasionally consume greater slow lorises (*Nycticebus coucang*), and hunting has previously been observed in 12 cases involving two adult female orang-

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utans in the Ketambe population (Utami and van Hooff 1997), three individuals (two adult females and one flanged male) at Suaq Balimbing (van Schaik et al. 2009) and one mother–infant dyad in Ketambe (Hardus et al. 2012). Van Schaik et al. (2009) suggest that orang-utans may come across these quiet nocturnal primates while foraging for food, as hunting and eating vertebrate meat is very rare in orang-utans, unlike patterns observed for chimpanzees (Boesch 1994; Goodall 1986; Whiten et al. 1999), where meat constitutes up to 3 % of the diet for some communities and occurs during periods of high fruit availability (Stanford 1998). So far, no ill effects have been reported for orang-utans that have eaten slow lorises, which are venomous primates that are known to cause anaphylactic shock in humans (Hagey et al. 2007; Nekaris et al. 2013). Indeed, “slow loris eating” has been considered a cultural innovation in populations of *P. abelli* (van Schaik et al. 2003), particularly because of the notable absence of this phenomenon in *P. pygmaeus*, which is usually sympatric with slow lorises (van Schaik et al. 2006). Here, we report the first observed interactions between the Bornean orang-utan *P. pygmaeus* and the Philippine slow loris *N. menagensis* in the Sabangau peat-swamp forest, Borneo.

Methods

These observations were made on two individual orang-utans, an adolescent female in 2004 and another adolescent female in 2012. Field research was carried out as part of the OuTrop-CIMTROP multi-disciplinary research project within the northern Sabangau Forest, a 5,780-km² protected tropical peat-swamp forest in Central Kalimantan, Indonesia. Sabangau supports the largest contiguous population of Bornean orang-utan, estimated at 6,900 individuals (Morrogh-Bernard et al. 2003; Singleton et al. 2004), and is also home to eight other primate species, including the Philippine slow loris (*N. menagensis*, Munds et al. 2013).

Behavioural research on orang-utans started in 2003, and since then over 16,000 data hours have been collected on 61 individuals from five different age/sex classes. Standardised field data collection procedures (Martin and Bateson 1993; Morrogh-Bernard et al. 2002) using instantaneous sampling of focal animals were used. Direct observations presented in this paper were made by HMB (2004) and JMS (2012).

Results

The first observation occurred in August 2004 during a period of low fruit availability [an average of 4.3 % of all

stems surveyed contained fruit; this was calculated as the percentage of fruiting stems with fruit = (number of stems of species *x* with fruit in month *y*/number of fruiting stems of species *x*) × 100; Harrison et al. 2010]. The encounter began at 0825 h, when an adolescent female orang-utan (ca. 7 years old), travelling and playing with an adolescent male orang-utan (ca. 8 years old), entered a tree ca. 16–20 m high. A female slow loris and infant were perched on a branch about 10 m high. While the two orang-utans played at the top of the tree, the loris remained still, but the eyes of the adult female loris were open while her infant clung to her belly. There was much movement above and the loris started to move slowly away. When the female adolescent orang-utan descended the tree very quickly towards the branch on which the loris moved, the loris rapidly moved away from the orangutan but remained in the same tree. The orang-utan remained stationary for a few minutes and then moved away with no attempt to chase the loris, which had by then disappeared out of sight of the observer and presumably the orang-utan. The adolescent female orang-utan then resumed play with the adolescent male.

The second account took place in October 2012 (when fruit availability was also low: 5.8 % of stems bore fruit), when an adult female orang-utan was accompanied by her two offspring: an adolescent female (8 years old) and dependent female infant (2 years old). Around 1030 h, while the adult female was resting in a tree (16–20 m) with her infant, her adolescent offspring was seen shaking a large branch of a sapling about 5 m away (11–15 m). On this branch was an adult loris. The adolescent female orang-utan was standing bipedally in the tree near the trunk about 12 m up, and the slow loris was further out on a branch at the same height. The orang-utan was energetically shaking the branch though the loris successfully held onto it. The orang-utan tried to move out onto the branch, reaching out to grab the loris, but the loris backed away, travelling further out on the limb while facing the orang-utan and attempting to bite or scratch the orang-utan during its retreat. The orang-utan then began to shake the branch again. This pattern continued, with the loris moving from branch to branch within the small tree as the orang-utan tried to approach. The loris stayed on branches that were too small to support the orang-utan's weight. Sometimes the orang-utan would pause to watch the loris (Fig. 1).

About 5 min into the encounter, the loris tried to climb down the trunk of an adjacent sapling (moving slowly), getting within 10 m of the ground, where it paused, potentially as a result of seeing the observers standing nearby. It then moved back out onto smaller branches, remaining out of reach of the orang-utan, which was pursuing it and continuing to shake the tree. This encounter lasted approximately 10 min until the orang-utan appeared



Fig. 1 Adolescent female orang-utan and adult slow loris. © Bronwyn Eva/OuTrop

to lose interest and moved away to rejoin its mother, which had remained resting in the nearby tree. Once the orang-utan had left the immediate area, the loris began ascending the trunk of a taller nearby tree and disappeared into the canopy above 16 m. The orang-utans then moved on to another tree, out of proximity of the loris. At no point did the orang-utan successfully grab the loris, although it may have been scratched or bitten in one of its multiple attempts to make contact. The loris appeared physically unharmed at the end of the encounter, and the orang-utan showed no visible signs of illness, injury, or envenomation throughout the day. The lack of interest from the adult female (2012) and from the first adolescent (2004) suggests that the behaviour described in these encounters was not related to predation behaviour by the orang-utans.

Discussion

There are only three known accounts of a Bornean orang-utan (*Pongo pygmaeus*) eating vertebrate meat. Following 50,000 h of observations in Gunung Palung National Park, one juvenile female was observed catching and eating a rat (Knott 1999), and in over 20,000 h of focal animal follows in Sabangau, only one flanged adult male orang-utan in Sabangau was observed to consume an adult horse-tailed squirrel (*Sundasciurus hippurus*), which was believed to have been scavenged (Buckley et al. 2014). From Tanjung Puting National Park, volunteers reported seeing a male orang-utan reach into a squirrel nest and eat two baby squirrels (Dale 1986). These detailed observations suggest

that meat eating is exceedingly rare in the Bornean orang-utan.

Although orang-utans are clearly capable of catching and consuming a slow loris, as demonstrated by Sumatran orang-utans (Hardus et al. 2012; van et al. 2009; Utami and van Hooff 1997), this behaviour has not been seen in Borneo. Slow loris locomotion and behaviour make them particularly susceptible to capture, as evidenced by their prevalence in the pet trade.

The adolescents in this report were interested in the lorises, particularly the second observation, but their behaviour did not result in the death of the loris. The behaviour during the 2012 observation could be described as play or aggression rather than any attempt to consume the loris. Evidence that the loris was not a targeted prey item comes not only from the fact that neither adolescent orang-utan caught one, but also from the oblivious behavior of the mothers, as both lorises were in easy reach. To the observers, the encounter appeared more similar to when they find something new and novel, and they are interested to see what it is. The fact that the mother (2012) did not stop her daughter from playing with a venomous animal is interesting, and it suggests that maybe Sabangau orang-utans do not come into contact with many lorises and thus do not know the dangers.

The number of individuals that were reported to feed on lorises in Sumatra is small (six); only nine incidents have been reported (Hardus et al. 2012). The infrequency of encounters between lorises and orang-utans, despite thousands of hours of focal-animal follows on Sumatra, shows that this is not a common occurrence. The nocturnality of the slow loris (Hart 2007) or their ability to fend off potential orang-utan predators with venom defenses may explain this (c.f. Alterman 1995). Hardus et al. (2012) describe slow loris eating in the Ketambe population as opportunistic, as only a few individuals do this and it is not common in the population. Hardus et al. (2012) suggest this is a cultural trait within some families (Hardus et al. 2012), and is more prevalent when fruit availability is low. We mention the fact that both Sabangau encounters occurred during periods of low fruit availability to draw parallels with the Sumatran studies and to highlight that this period of the year would be the opportune time for predation events if vertebrate meat was a fallback food. Thus, the lack of predation is even more significant given the low fruit availability. The fact that both lorises from both observations were seen just sitting on branches in the daylight also indicates that maybe the Bornean species (*N. menagensis*) is not preyed upon as much as the Sumatran species (*N. coucang*), so the lorises in Borneo do not show defensive behavior when encountering orang-utans. The complete lack of interest from the adult females strongly

suggests that these orang-utans have no experience of dealing with slow lorises, either as food or a threat.

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