

suggestions to earlier drafts of this report.

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PREDATORY BEHAVIOUR BY A RED HOWLER MONKEY (*ALOUATTA SENICULUS*) ON GREEN IGUANAS (*IGUANA IGUANA*)

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We report here on our observations of the predatory behavior of a red howler, free-ranging on a 56-ha forested island (4°53'N, 52°10'W), the Îlet-La-Mère, offshore from Cayenne, French Guiana. The island vegetation can be characterized as an old secondary forest with dominance of *Spondias mombin* (Anacardiaceae), *Astrocaryum vulgare* and *Desmoncus orthacanthos* (Arecaceae), *Cecropia obtusa* (Cecropiaceae), *Gustavia augusta* (Lecythidaceae), *Guarea guidonia* (Meliaceae), *Inga nuda*

(Mimosaceae), *Virola sebifera* (Myristicaceae), *Alibertia edulis* (Rubiaceae) and *Pouteria guianensis* (Sapotaceae) (M. Nugent, unpubl. data). The Pasteur Institute of French Guiana was established there 15 years ago as a squirrel monkey (*Saimiri sciureus*) breeding colony for use in malaria research programs (de Thoisy and Contamin, 1998). One hundred and twenty squirrel monkeys are held in captivity and approximately 180 are free-ranging, released as from end of the 1970's. A single male red howler monkey is also present on the island (no howlers occur there otherwise). Unfortunately, there is little information about the history of this howler. Its mother was killed by hunters and it was hand-reared and was released on the island in the early 1980's when presumed already adult (C. Roussillon, pers. comm.). It is today free-ranging, completely independent and apparently healthy.

Predatory behaviour on green iguanas by this male howler has been recorded opportunistically on 12 occasions between 1991 and 1997. Ten of these events occurred at the end of the dry season (October to December). The howler would hunt the iguanas along large branches of old mango trees present in a small part of the island where the howler is often found. On two occasions the prey was pursued on the ground. As a rule the howler would spot the iguana motionless in the sunlight, move slowly forward, and then suddenly rush upon its prey. In nine of the 12 attacks, the howler failed. Twice, however, it succeeded in catching young individuals (body length approx. 25 cm), and then proceeded to eat the hind legs and the base of the tail, without killing them first. On another occasion, the howler caught an adult (body length approx. 40 cm) by the tail that then broke; the iguana escaped and the howler ate the part of the tail remaining in its hands.

Insectivory is not rare among cebids, and predation of vertebrates has been recorded in *Cebus* spp. and *Saimiri* spp. (for example, Newcomer and de Farcy, 1985; Boinski and Timm, 1986; Clarke, 1987; Fedigan, 1990; Galetti, 1990; Souza *et al.*, 1997; pers. obs.). Howlers on the other hand, are considered to be strictly folivorous-frugivorous by all authors (Crockett and Eisenberg, 1987; Neville *et al.*, 1988; Julliot and Sabatier, 1993). None of the numerous long-term studies on *Alouatta* species have described predatory behaviours, except nestling predation by a juvenile *Alouatta palliata* observed by Sue Boinski (pers. comm.). Insect fragments can be regularly found in feces (pers. obs), but may be an accidental consumption when eating fruits, leaves or flowers (Dunn, 1970).

Hypotheses to account for this exceptional hunting of lizards are speculative indeed. The capture of vertebrates appears to be largely opportunistic in most of the Cebidae (Clarke, 1987). This hunting activity could be a play behaviour, and may be initiated by the proximity of the free-ranging squirrel monkeys that regularly pursue small-sized lizards (pers. obs.). A penchant for the taste of meat, possibly acquired during its time in captivity, may have induced these repeated acts. Finally, the hunting and consumption of the iguanas could be adaptive behaviour arising from the need for

proteins. Red howlers are quite opportunistic in their diets in disturbed habitat (de Thoisy and Richard-Hansen, 1997). Plant diversity is low on the island: only 28 ligneous species are common on the island (M. Nugent, unpub. data), and just six of them are among the 195 species constituting the diet of howlers in their natural habitats on the mainland, none of which are included amongst the 40 species most regularly consumed (Julliot and Sabatier, 1993). Hunting was observed mainly during the dry season, when fruits are scarce on the island. Meat-eating by blue monkeys (*Cercopithecus mitis*) has also been reported during the driest seasons and has been interpreted as an important protein contribution to its diet (Fairgrieve, 1997).

Although the unusual history of this howler complicates any conclusion about this behaviour, the repeated successful predation of iguanas is significant. Howlers are generally peaceful "opportunistic folivore-frugivores" (Julliot and Sabatier, 1993). Nonetheless, they are capable of showing considerable aggression (Crockett and Pope, 1988), and at times show unexpected behaviours (see Richard-Hansen *et al.*, 1998), and occasionally resort to unusual food items (de Thoisy and Richard-Hansen, 1997).

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ADOPTION OF A YOUNG JUVENILE IN BLACK HOWLER MONKEYS (*ALOUATTA PIGRA*)

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Introduction

Infant adoptions have been reported in several non-human primate species (Thierry and Anderson, 1986). Permanent infant adoption may be a selfish behaviour of the adoptive mother to practice mothering skills (Lancaster, 1971) or it may also be altruistic and explicable by kin-selection theory (West-Eberhard, 1975). It is hard to explain all reported adoptions by these two theories, but in all cases it serves to aid the survival of a lost or abandoned infant. In this study a small juvenile female black howler monkey (*Alouatta pigra*) was adopted by a mother suckling her own small juvenile. Despite aggression from two males the orphan survived and remained in the troop. This paper describes the process of the adoption and discusses its implications.