

## BRIEF COMMUNICATIONS

# Meat Eating and Predation in Captive-Born Semi-Free-Ranging *Lemur fulvus* and Caged *Lemur macaco*

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A group of brown lemurs, *Lemur fulvus*, and a group of black lemurs, *Lemur macaco*, at the Duke University Center for the Study of Primate Biology and History have been observed to capture and eat birds and lizards. Although vertebrate prey are not unusual for many carnivorous prosimians, folivorous prosimians never have been observed to take vertebrates in the wild and rarely even insects.

**Key words:** lemurs, meat eating, predation

### INTRODUCTION

In a recent review of predation on vertebrates by nonhuman primates Butynski [1982] reported that ten species of prosimians prey on animals. All of these are nocturnal (Lemuridae, Lorisidae, Tarsiidae). Generally, the diets of nocturnal prosimians contain more animal matter than any other primate [Butynski, 1982]. In fact the diet of *Tarsius bancanus* contains 100% animal matter [Niemitz, 1980]. Compared to the nocturnal prosimians, diurnal prosimians are classified as plant-eaters. These plant-eating prosimians have never been observed to eat vertebrate prey in the wild and observations of captive members of these species eating meat are rare [Jolly and Oliver, 1985].

Here we report the eating of lizards (*Sceloporus undulatus*) by brown lemurs and several species of birds by both brown and black lemurs at the Duke University Center for the Study of Primate Biology and History (DPC). The birds eaten were cardinals (*Cardinalis cardinalis*), brown thrashers (*Toxostoma rufum*), and Eastern peewees (*Contopus virens*). The brown lemurs live in a large, forested enclosure and have developed hunting and capture skills.

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## METHODS

### Subjects

A group of seven brown lemurs (three *L. fulvus fulvus* and four *L. fulvus fulvus* × *L. fulvus rufus* hybrids) were released in a 1.2-acre natural habitat enclosure adjacent to the DPC on August 4, 1981. The enclosure is part of Duke Forest and contains 265 trees surrounded by a six foot high chain link fence topped by a strip of sheet metal. The fence is located in a 30-ft-wide area cleared of trees in order to prevent the animals from escaping through the trees. There are five strands of electrified wire on the inside of the fence. Four heated sleeping and feeding stations are located in various places in the enclosure. The animals are fed and watered inside these stations. Food consists of Purina Monkey Chow and fruit each day. In addition to these provisions the lemurs feed on plant material found in the enclosure.

A group of 17 ringtailed lemurs (*L. catta*) also lived in the same enclosure from October 14, 1981, until December 13, 1983, when they were moved to an 8.75-acre enclosure.

A group of five black lemurs were housed in a corn crib (18 ft high with a diameter of 12 ft) located adjacent to the Primate Center, 75 feet from the natural enclosure.

## RESULTS

In the fall of 1981 several dead birds were found on the ground inside the enclosure [Rabin, 1983]. How they came to be there was unknown. There was no evidence that the lemurs had fed on the birds or that they were interested in the birds. The birds were removed. Several times during the spring of 1982 cardinal feathers were found in the enclosure but again neither the animal caretakers nor the observers working in the enclosure knew from where these feathers had come. In late December 1982 a dead cardinal was again discovered by us in the enclosure. Soon thereafter the cardinal was discovered by a juvenile female brown lemur. She picked it up, sniffed it several times, bit the head off, and then ate all of it.

During May 1983 a juvenile male and female brown lemur were observed chasing a brown thrasher and a nuthatch (*Sitta carolinensis*) they had respectively trapped inside one of the feeding stations. The lemurs did not capture the birds, as they escaped through the door. Two of the four sleeping and feeding stations have chicken-wire surrounding them. The mesh in the wire is too small for birds to fly through, so to enter and leave the feeding stations (seeking the monkey chow and fruit placed there for the lemurs) the birds must either perch on the wire or fly through the human-size doors at either end of the feeding stations.

On May 30, 1983 the adult female in the brown lemur group cornered and caught a brown thrasher in one of the feeding stations. She grasped it with one hand, bit the head off in the classic cranial-cervical killing bite [Steklis and King, 1978], ate the brain, and dropped the body. The body was eaten by the same female juvenile brown lemur that had eaten the earlier birds. On June 1, 1983 the juvenile male, who was seen chasing a bird in May 1983, caught with his hand a brown thrasher in one of the feeding stations. After catching it he did not know what to do with it. The juvenile female, mentioned above, took the struggling bird from the male, bit the head off, ate the brain, and then ate the rest of the bird (Fig. 1). The male did not try to get any of the bird.



Fig. 1. A juvenile female brown lemur carrying a brown thrasher just prior to beginning to eat it.



Fig. 2. An adult female brown lemur eating a fence lizard she captured. Each animal wears a collar and a tag for easy identification at a distance.

Cardinal feathers also were found many times in black lemur runs. In February 1983 an adult female (pregnant) black lemur was observed to capture, kill with a bite to the head, and eat a cardinal that had entered the cage searching for monkey chow. Before its capture by the pregnant female the bird was chased for about 5 min by two males and another female. The pregnant female ate most of the bird although the other four animals ate whatever they could obtain. All of the bird except the beak and large flight feathers were eaten.

In February 1984 the juvenile (now adult) female brown lemur mentioned above caught a fence lizard (Fig. 2). She ate the head and shoulders and dropped the rest.

## DISCUSSION

There was a marked difference between the ringtail and brown lemurs' response to the same potential food source. The ringtailed lemurs sniffed and handled some of the dead birds but never ate any. There is nothing in the feeding behavior of wild *L. catta* or *L. fulvus rufus* [Sussman, 1979] to suggest either that brown lemurs might prey on vertebrates if given the opportunity or that the two species would show such different responses to the birds. It is possible that wild brown lemurs have not been

seen to eat birds or other vertebrate prey because they cannot catch them during the day when the birds are active and can easily avoid capture. (The wire around the feeding stations may have allowed the lemurs to corner and catch an otherwise elusive prey.) Possibly wild lemurs may be more successful during the night when birds are sleeping and easier to catch. Tattersall [1982] reports several subspecies of brown lemurs with nocturnal activity periods and Harrington [1975] found *L. fulvus fulvus* active at night. The fact that only nocturnal prosimians have been observed to eat vertebrate prey may be significant in this context.

Sex differences were obvious with only the females of both the brown and black lemurs developing reliable capture and killing techniques. Males of both brown and black lemurs chased birds but only one bird was caught by a juvenile brown lemur male and then he did not know what to do with the live bird.

All of the animals described in this paper are several generations captive-born and thus have had no previous opportunity to gain experience by watching other lemurs capturing, killing, and consuming birds. However, given the chance, these plant-eating prosimians took advantage of an opportunity to obtain animal food. Not only did they take advantage of dead birds but the lemurs developed hunting and capture skills necessary for the capture of live birds. This suggests that they are opportunistic and highly adaptive. It will be interesting to follow further meat-eating activities to determine if, and under what circumstances, the rest of the brown lemurs in the enclosure and future generations learn to capture and eat birds and other vertebrates. These observations indicate that predatory traditions are widespread among primates, including those most distant phylogenetically from humans.

## CONCLUSIONS

1. Captive-born brown and black lemurs will eat meat.
2. Captive-born ringtailed lemurs did not eat meat.
3. There was a sex difference in capture and killing skills.

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