

REDISCOVERY OF THE PHILIPPINE BARE-BACKED
FRUIT BAT (*DOBSONIA CHAPMANI* RABOR)
ON SOUTHWESTERN NEGROS ISLAND,
THE PHILIPPINES

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ABSTRACT

Since its last sighting in the late 1960s, the Philippine Bare-Backed Fruit Bat was presumed extinct. Its recent discovery on southwestern Negros Island confirms the existence of the species, despite the animal's disappearance in their former habitat on Negros Island. The discovery of five individuals in Calatong forest is a new capture record for the species. This paper also discusses the behavior of the individuals in captivity and their habitat characteristics. Netting success is also discussed together with the capture success of other bat species. This study was made possible through a grant provided by the ASEAN Regional Centre for Biodiversity Conservation (ARCBC).

Introduction

The Philippine Bare-Backed Fruit Bat (*Dobsonia chapmani*) (Fig.1), endemic to the Negros and Cebu Islands, the Philippines (Heaney, 1986; Heaney *et al.*, 1998), was described by D. S. Rabor in 1952. It has been reported to inhabit lowland tropical rain forest from sea level to 800 m above sea level, roosting in caves (Rabor, 1952 and 1986; Heaney and Heideman, 1987; Utzurrum, 1992; Heaney *et al.*, 1998). Fieldwork in limestone areas at and near the type locality in southwestern Negros Island from the late 1960s to 1998 failed to locate a single example of this species. This led Heaney and Heideman (1987), Utzurrum (1992), and Heaney *et al.* (1998) to suspect that the species has been extinct since the 1970s as a

result of forest destruction, disturbances made by guano miners inside the bats' roosting caves, and hunting. Later, Heaney *et al.* (2002) labeled the species as "Extinct?". The rediscovery of this fruit bat in the Calatong Forest, Sipalay City in southwestern Negros in May 2003 shows that it is surviving on Negros Island, albeit in small number. This finding has also expanded its known distribution on Negros.

The present paper reports our observations on the rediscovered Bare-Backed Fruit Bat and its natural habitat in southwestern Negros Island. The fieldwork leading to the discovery of this fruit bat species is part of a larger study on the effects of tropical rainforest fragmentation on the herpetofaunal and mammalian species in several forest fragments in the municipalities of Hinobaan, Cauayan, and Sipalay (all in southwestern Negros) from August 2001 through May 30, 2003.



Fig. 1. Different views of *Dobsonia chapmani* showing back portion and different head perspectives.

Study Area

Calatong Forest is one of the several remaining fragments of lowland limestone forest in southwestern Negros Island, Philippines (Fig. 2). It is a logged-over dipterocarp forest with many patches of agricultural clearings. It is located in the area within $9^{\circ} 46' 58''$ N, $122^{\circ} 30' 9''$ E and $9^{\circ} 47' 6''$ N, $122^{\circ} 30' 16''$ E at an elevation of 20-270 m above sea level. The total area of this forest probably does not exceed 1,000 ha, of which about 100 ha were surveyed. The site explored is predominantly limestone rocks with little soil as a result of erosion and may be considered a karst formation, with abundant caves. It is separated from adjacent grassland ("cogonal") areas by the Calatong River. Although heavily logged in the past, some large trees still exist including 8 species of dipterocarp trees, which are important elements that structure the rainforest. These are *Anisoptera thurifera*, *Dipterocarpus gracilis*, *Shorea astylosa*, *S. guiso*, *S. negrosensis*, *S. polysperma*, *Parashorea malaanonan*, and *Vatica mangachapoi*. The forest has a low canopy cover of <10% because of the loss of many emergent trees, which unfortunately continue to attract poachers. The netting site (elevation 190m and at coordinates $9^{\circ} 47' 02''$ N and $122^{\circ} 30' 14''$ E) for *Dobsonia* was a rocky portion of a clearing planted to corn and cassava near a logged-over dipterocarp forest. A wild fig tree about 24m in height and 1m in diameter at breast height about 50m away from the clearing was apparently a feeding tree of fruit bats. The ground area around this tree was littered with pulp, regurgitated fruit parts, and rotten fruits. An indigenous kiln for making charcoal was found near its base, indicating one use of forest trees in the site.

Materials and Methods

We surveyed Calatong Forest on May 21 - 30, 2003. Mist nets 12m x 6m with 60 mm mesh size were used to capture the fruit bats. They were set up on a hill in a rocky portion of a clearing in such a way that the nets were well above the canopy of a fruiting wild fig tree nearby. The nets remained in place from 6 o'clock in the afternoon of day 1 to 6 o'clock in the morning of the following

Vegetation and Remaining Forest Patches in Greater Calatong Watershed



day, which was day 2 (= one net-night). The captured individuals were identified, measured for certain body parts, and marked with a water-based nail polish on one foot. For species determination, the taxonomic key of Heaney and Ingle (1991) was used. Two of these fruit bats (all males) were released on site. The other three were kept alive for observation.

Results and Discussion

Measurements of Captured Individuals

We caught 5 (4 adults and 1 juvenile) individuals of this rare species consisting of four males and one female at Sitio Narra, Barangay Manlucahoc, Sipalay City on May 26-28, 2003 (Fig. 1). Two distinct features are the animal's wings which meet at the mid-dorsal line, covering most of the back of the animal, and the yellow-greenish sheen of hair covering the neck. The measurements on the five individuals of the bare-back fruit bat are summarized in Table 1. Unfortunately, the three animals kept alive for observation died and were preserved as voucher specimens.

Table 1. Measurements of *Dobsonia chapmani* live specimens*

Indi.#	Sex	Age	TL	TV	EAR	FA	HF
C016	Male	Adult	218	22	27	133	30
C020	Male	Adult	175	24	28	121	29
ELA 30105	Female	Adult	240	20	28	130	28
ELA 30106	Male	Juvenile	220	22	24	119	30
ELA 30107	Male	Adult	256	26	26	133	32

TL=Total length; TV=Tailvent; FA = Forearm; HF=hindfoot; units are in millimeter (mm)

Historical and Present Distribution on Negros and Cebu Islands

Dobsonia chapmani is endemic to the islands of Negros and Cebu, Philippines (Heaney *et al.*, 1998). Its historical geographic distribution is summarized here based on published literature, collectors' field notes, and skin specimens deposited at three natural history museums. On Negros Island, it had a wide range in the southern half of the island (**Fig. 3**). Rabor (1952) caught 18 males from Mambajo Cave, Paniabonan, Bais on May 13, 1949. Presently, Paniabonan belongs politically to the Municipality of Mabinay. Two female individuals were taken from coconut palms on the bank of the Amio River, Sta. Catalina on May 20-21, 1948 (Rabor 1952). The Delaware Museum of Natural History has two specimens from Kansan-an, Basay from ca 180-200m; one from Malindog, San Antonio from 800m, and one from Camp Lookout, Valencia. At the Royal Ontario Museum, there are 15 individuals taken from Labogon, Basay on June 4-9, 1964.

Of the 7 skin specimens at the Silliman University Natural History Museum, 2 were caught from Basay, southern Negros on February 10, 1968, and 2 from Bayawan (no specific locality) southern Negros on April 8 and 9, 1969. On Cebu Island, the fruit bat apparently was distributed in the northern half of the island (**Fig. 3**). D.S. Rabor collected a specimen (now at the Silliman Museum) from Naga, central-eastern Cebu in the late 1940s and another specimen in the same locality on December 20, 1964.

At the present time, the Bare-Backed Fruit Bat is found only in the Calatong Forest in Sipalay City, southwestern Negros, where it was rediscovered in May 2003, and in the Catmon area, northeastern Cebu, where it was rediscovered in February 2001 (L. Paguntalan, pers. comm.). Present fieldwork on both islands hopefully will extend its ranges on the two islands.

Abundance

Five individuals (4 adults, 1 juvenile) of *Dobsonia chapmani* were caught in 50 net-nights of total field effort, a 0.10 netting

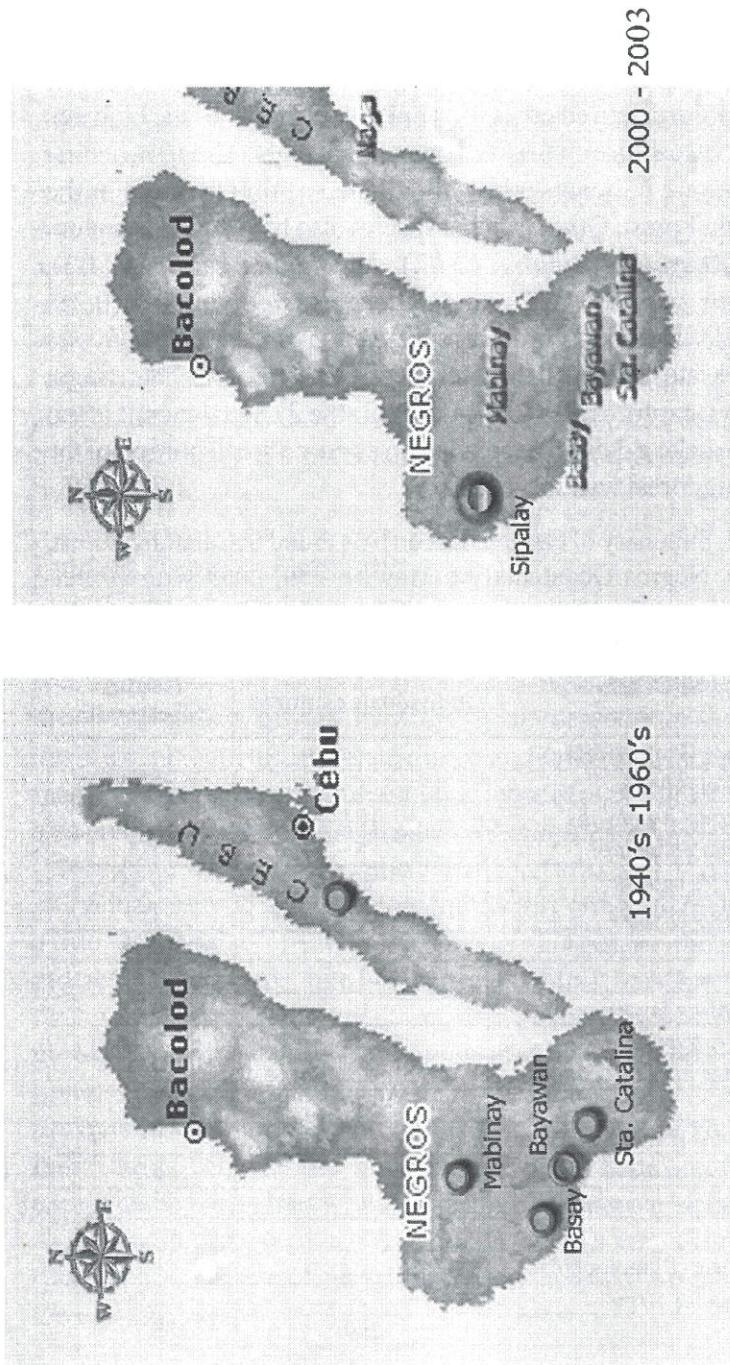


Fig. 3 Distributional range of *Dobsonia chapmani* on the islands of Negros and Cebu in 1940s-1960s and 2003.

success rate. Three males were caught on May 26 and two others, an adult male and a lactating female, were caught on May 28. The first capture occurred on the first operational night of the high net, the second capture on the third operational night. The 10% netting success rate indicates a low abundance of this fruit bat in the Calatong Forest. Other fruit bat species also have low net capture rates: *Acerodon jubatus* (0.02), *Nyctimene rabori* (0.02), *Pteropus pumilus* (0.22), and *Macroglossus minimus* (0.28) (Table 2). The most common species is *Cynopterus brachyotis* (capture rate, 2.08). All three species of insectivorous bats caught have low capture rates (0.02-0.04) (Table 2). However, it is too early to make a definitive conclusion as only a small portion of the Calatong forest was surveyed.

Table 2. Summary of capture data on bats found in Calatong Forest, Sipalay, Negros Occidental on May 21 - 30, 2003 with 50 net-nights of total field effort.

SPECIES	Number of individuals captured	Netting success rate
Fruit bats (Pteropodidae)		
<i>Acerodon jubatus</i>	1	0.02
<i>Cynopterus brachyotis</i>	104	2.08
<i>Dobsonia chapmani</i>	5	0.1
<i>Eonycteris robusta</i>	27	0.54
<i>Eonycteris spelaea</i>	35	0.7
<i>Macroglossus minimus</i>	14	0.28
<i>Nyctimene rabori</i>	1	0.02
<i>Ptenochirus jagori</i>	41	0.82
<i>Pteropus pumilus</i>	11	0.22
<i>Rousettus amplexicaudatus</i>	25	0.5
Insect bats (Emballonuridae)		
<i>Emballonura alecto</i>	2	0.04
<i>Saccopteryx saccolaimus</i>	1	0.02
Insect bats (Rhinolophidae)		
<i>Rhinolophus virgo</i>	2	0.04
Total	269	5.38

Age and Reproductive Condition of Captured Individuals

Of the four male individuals captured, three were adults with large scrotal testes. One male (ELA 30107) showed characteristics of old age as its hairs on the head region were sparse and thin. The occlusal surface of the molars was worn out and irregular, and the canines were thin and less conical in appearance. The single juvenile had its testes in the abdominal region. The lone female was also observed to be very old as hairs were thinning and sparse in distribution and the teeth were worn out. It had large axillary mammae and was still lactating when caught. Regions around the nipples had several marks formed by the teeth of suckling infants. However, no infant was seen carried by this female.

Feeding Habits in Captivity

Captured individuals were fed with sweetened orange juice. However, not all of them ingested the juice with gusto. When feeding, the bats did not use their tongue in ingesting the juice, like the other fruit bats. Instead, they slightly submerged their snouts in the juice, placing the mouth in direct contact with the juice, and made chewing movements resembling those of pigs. The bats were also given ripe fruits of "mansanitas" (*Muntigia calabura*), mango (*Mangifera indica*), and yellow banana (*Musa sp.*). All four individuals refused to ingest these fruits. Only one adult male took a ripe "mansanitas" fruit. In the process of ingesting the fruit, it did not use its tongue, like other species of fruit bats, but bit the fruit with its front teeth (incisors), then pushed the fruit into its mouth. Chewing of this fruit occurred only when the bat was given the juice supplement while it was facing down. Feeding the bats in a hanging position was also tried, but none of the individuals took in the juice supplement. Fecal materials eliminated by these bats while inside the cloth bag were observed as fluid with some brownish residues and had a very strong bad (putrid) odor. These observations could indicate that the bat is also a meat eater.

Notes on General Behavior

The captured bats were generally docile and assumed a mild disposition when handled, readily clinging to the hand. They also appeared to be sensitive to light and closed their eyes when exposed to sunlight. They seldom made noise, unlike *Ptenochirus jagori* and *Cynopterus brachyotis*. But when held tightly, the bat produced a sound similar to that of a piglet. This could be its distress call. Rabor (1949, unpublished field notes) noted the fruit bat's ability to hover in midair while maneuvering to enter a cave. This observation coincides with the description provided by local observers of a certain species of bat that has the ability to hover and swoop down in gliding motion. The wings of *Dobsonia chapmani* appear shaped for hovering and gliding. The wings are "mounted" dorsally and are relatively short, allowing greater lift and improved maneuverability, aerodynamic characteristics which conventional bats are less endowed with (Nowak, 1997). It appears that this ability to hover and glide gives the bats the advantage of maneuvering in tight and confined spaces (as in caves); it is likely that it also plays a vital role in flight and in foraging. However, this needs to be further investigated.

Associated Fruit Bat Species

Taken together with *Dobsonia* on May 26, 2003 were the following fruit bat species: *Pteropus pumilus*, *Rousettus amplixicaudatus*, *Eonycteris spelaea*, and *E. robusta*. The species caught with *Dobsonia* on May 28, 2003 were *Ptenochirus jagori*, *Rousettus amplixicaudatus*, *Pteropus pumilus*, *Eonycteris spelaea*, and *E. robusta*. In another net-night or date, *Acerodon jubatus* and *Nyctimene rabori* were also caught with the same net placed high over the forest canopy, but without the bare-backed fruit bat. All other bat species listed in Table 2 were taken by other nets.

Habitat of the Bare-Backed Fruit Bat

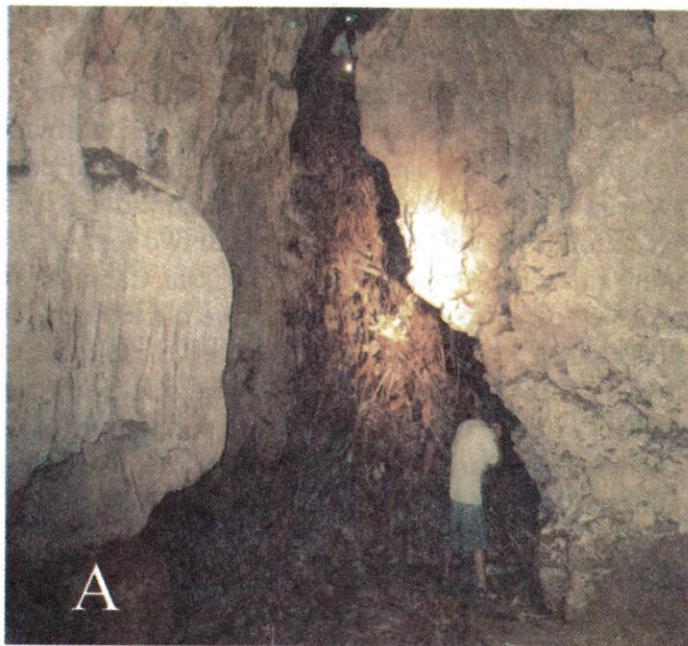
What are the major features that define the habitats of *Dobsonia chapmani*? Is it the presence of caves alone? Or is it caves plus something else? First, this bat has not been historically recorded from Cuernos de Negros, a volcanic area without caves. The localities in southern Negros and northern Cebu where the species has been recorded are limestone areas (karst formation) characterized by the presence of caves. Basay and part of Bayawan on Negros are limestone areas with large river systems. An exception is the collection by Rabor of two females from coconut palms on the bank of Amio River, Sta. Catalina town, southern Negros where limestone habitats were not evident. Thus negative evidence (absence of the fruit bat in volcanic area) and positive evidence (presence in limestone areas near river systems on Negros) would seem to point to the important role of karst (limestone) substratum in the vicinity of rivers in the structuring of the rainforest habitats of the Bare-Backed Fruit Bat.

Need to Conserve the Calatong Forest, Sipalay City

Interviews of eight hunters in the Calatong area indicate that fruit bats, including this species, have been hunted, and considerable numbers have been taken with the use of thorny vine attached to long poles to hook the animals while in midair. Elaborate entraptments set in cave openings have been observed in several caves visited during the study (Fig. 4). However, this report needs to be verified and the number of the Bare-Backed Fruit Bat caught by hunters determined.

The forest is surrounded by patches of cultivated area and uncultivated coarse grassland made up of cogon (*Imperata cylindrica*). There are about 819 households, 10 of which live inside the forest. Taking the average household number as 6, the estimated human population in the vicinity of the forest would be about 4,914 persons. The presence of this large number of people in and near the Calatong Forest poses a threat to the survival of wildlife, including bats. Another threat is the destruction of the forest itself, part of which is a mining claim. The immediate and

Fig. 4. A, a typical bat entrapment set at the mouth of the cave in Maanghit cave, Sipalay City. B, a thorny vine mounted on pole used to capture bats in midair.



stringent protection of this forest fragment is made urgent by the fact that it is a major watershed of Sipalay City.

Summary, Conclusion, and Recommendation

The Philippine Bare-Back Fruit Bat is still surviving on a small fragment of limestone tropical rainforest (ca 1,000 ha) in southwestern Negros. Field observations indicate the important role of caves and possibly freshwater bodies in the structuring of its habitat. The population size on Negros appears small and its habitat is threatened by forest poachers. The species should therefore be considered Endangered. Because so little is known about this species, no effort should be spared to study its population and field biology.

The preservation of the Calatong forest is the only way to save what is probably the last surviving population of this endemic fruit bat on the island of Negros. But this is only possible if the stakeholders—the Sipalay City government, the people living in the area, the hunters, and the forest poachers—can be persuaded to protect this unique fruit bat and its habitat. Sipalay City stands to benefit from the forest protection in terms of water generated by this forest for domestic use and for irrigation of agricultural farms.

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