Further Studies on the Chiropteran Fauna of the Polillo Islands

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Abstract

Tunnel trapping and mist netting at nine sites brings the total number of microchiropteran bats known from the Polillo islands to 20 species. *Hipposideros coronatus* was found for the first time since its description in 1871. Evidence from ultrasound recordings suggests the total speciosity of communities on Polillo is still underestimated and that more intensive surveying techniques are required for a proper understanding of the composition and structure of bat communities. The foundation of a library of echolocation calls of Polillo bats is intended to facilitate the acceptance of standardised and adequate sampling programmes throughout the Philippines.

Introduction

Alviola's (2000) surveys of bats on the islands of Polillo and Minisawa found a total of 24 species, including 16 species of microchiropterans, the highest species richness (23) recorded on any island of its size in the Philippines. However species accumulation curves and evidence from ultrasound surveys suggested that the richness of all communities on the island remained underestimated.

Methods

In order to further sample the islands' bat fauna mist nets or a 10 x 3 x 4m tunnel trap were set at two locations sampled in 1999 and seven new locations elsewhere in the Polillo Islands. Bats caught were identified and released. Where possible echolocation recordings were made whilst the bats were flying in the tunnel trap and during release, using a Petersson D240X time expansion ultrasound detector. Trapping was undertaken on a opportunistic basis, depending on the weather and limitations imposed by other work.

Results

Summary of capture data is given in Table 1. Four species previously unknown from the islands were recorded (*Miniopterus tristis, Rhinolophus virgo, Emballonura alecto* and *Hipposideros coronatus*). The three specimens of *Hipposideros coronatus* may be the first reported since its description in 1871.Overall catch per unit effort was very low compared to 1999 at sites where comparison was possible. That overall microchiropteran activity was low in 2001 is supported by preliminary analysis of echolocation data, with encounter rates of less than two bats per hour recorded on most nights.

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	Scrub near Aluyon Forest	Burdeos cave 1	Burdeos Cave 2	Putting Bato	Mt. Malulod	nr. Sibulan	Aluyon	Baleti	Anibawan	Luod Caves, North Patnanougan	South Patnanugan	Jomalig
Emballonura alecto										X		
Miniopterus australis			X	X		X						
Miniopterus schreibersi			X							X		
Miniopterus tristis										X		
Hipposideros ater		X		X			X			X		
Hipposideros diadema		X		X			X			X		
Hipposideros pygmaeus		X		X		X						
Hipposideros bicolor	X											
Hipposideros coronatus			X									
Rhinolophus arcuatus			X									
Rhinolophus virgo				X			X			X		
Rhinolophus rufus		X	X	X								
Kerivoula whiteheadii	X								X			
Murina cyclotis						X					X	
Myotis horsfieldii			X					X				
Myotis macrotarsus			X									
Macroglossus minimus	X				X				X			
Ptenochirus jagori							X				X	
Rhinolophus arcuatus												
Pteropus hypomelanus												X
Cynopterus brachyotis					X			X	X			X
Rousettus amplexicaudata		X										X
Eonycteris spelea			X									

Table 1. Captures of bats on the Polillo Islands, 2001.

Sedlock (2001) recorded 22 species of insectivorous bats on Mount Makiling, Luzon, using mist nets, tunnel traps and frequency division ultrasound detectors, and suspected that some members of the community had eluded her. The 20 species recorded from Polillo is certainly an underestimate

These observations support earlier conclusions that the sampling effort usually afforded to microchiropteran bats in tropical habitats is very rarely adequate to provide meaningful data on species richness and completely meaningless in the context of diversity (Russ and Bennett 1999, Bennett and Russ 2001, Sedlock 2001). Catching representatives of all species present requires simultaneous use of a variety of techniques, intensive investment of time and personnel and a fairly rigorous control based on species accumulation curves and ultrasound surveys. Usually it is necessary to actively hunt for the most elusive members of the community, rather than hope to trap them passively. Clues from echolocation analysis, an energetic and thorough approach to trap sampling and the inclination and ability to continue surveying until sufficient effort has been spent are prerequisites to meaningful surveys of microchiropteran communities in tropical environments.

The Philippines is fortunate among southeast Asian countries in having a simple, effective and largely complete dichotomous key that can be easily applied to live animals (Ingle and Heaney 1992). The existence of this guide is undoubtably the major reason why chiropteran surveys are popular among students, although at present these surveys rely almost exclusively on mist nets and as a result insectivorous bats are poorly represented. There is a clear need for standardised and effective methodologies for sampling microchiropteran communities (Sedlock 2001).

The rhinolophid bat *Hipposideros coronatus* was known only from the type specimen, described in 1871 by Peters. Here we report on the rediscovery of the species at Bulalon Cave near the town of Burdeos in the west of Polillo Island, Quezon Province.

In October 2001 during faunal surveys around Polillo Island a local farmer brought us three dead bats he had removed from a cave near the town of Burdeos. Two of these bats were *Miniopterus australis*, the other was a large *Hipposideros* species. This bat was unlike any we had seen before mainly because it had a completely undivided terminal noseleaf. Subsequently we sampled the bat fauna of this cave (using mist nets set 200m from the cave entrance to avoid unnecessary disturbance) and caught two similar animals (along with nine other microchiropteran species – Table 1), which were measured and released. Attempts to make recordings of the echolocation of this species both in free flight and in cages were not successful. The specimen was preserved in alcohol and deposited at the National Museum of the Philippines.

Description of specimen: Young male, body length 56.4mm, forearm 50.2mm, ear 15mm, tail 34.5mm, condylobasal length approx 16.5mm. The noseleaf is similar to *H. diadema* except that the terminal leaf lacks septa and appears completely undivided apart from two very faint longitudinal furrows. The anterior noseleaf lacks supplementary leaflets and there is a low internarial septum. The ventral surface is orange, the dorsal surface brown. We have not examined the teeth or the skull.

Given the distance between the type locality and Polillo Island, *H. coronatus* is unlikely to have a narrow distribution. Because it was known from a single specimen its IUCN listing as lower risk - near threatened seems unjustified (Hutson, Mickleburgh and Racey 2001). However its long absence from scientific records is most probably attributable to the general paucity of insectivorous bat surveys in the Philippines and the fact that sampling effort in tropical bat communities is rarely sufficient to catch a representative sample of any community (Russ and Bennett 1999). The bat community on Polillo, which appears to be unusually species rich (a total of 28 species), has been the subject of high effort surveying using a variety of sampling methods (Alviola 2000) and may prove unexceptional when other areas have been adequately surveyed.

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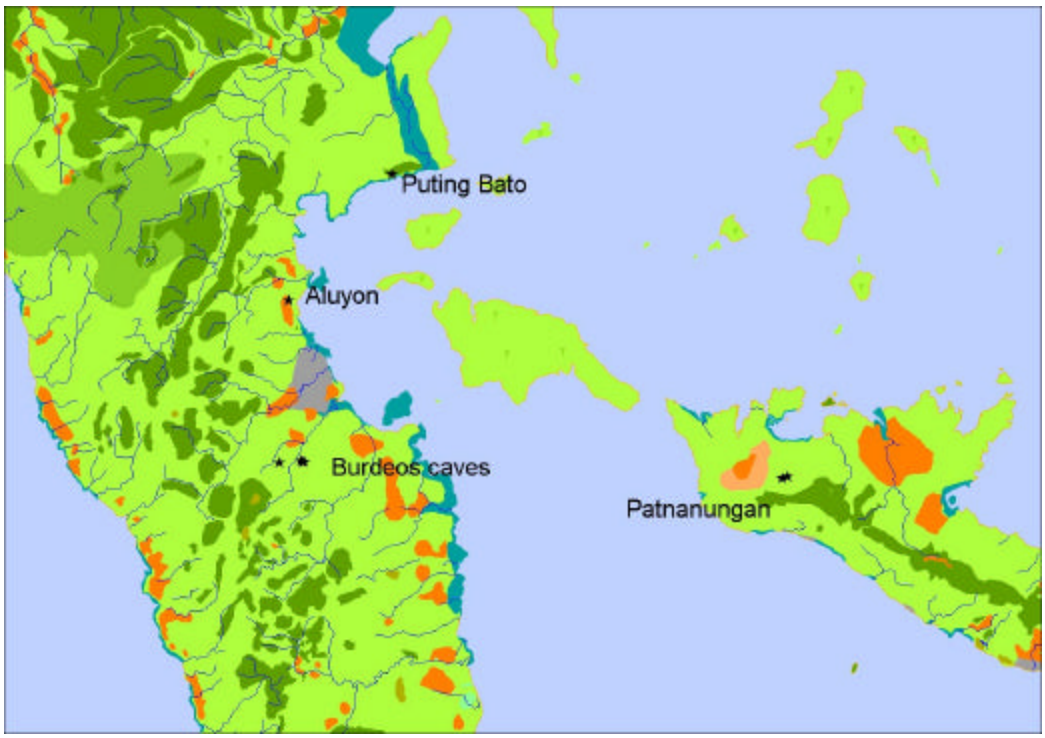

Map 1. Key bat caves on the Polillo Islands.

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Appendix I

Checklist of Bats of the Polillo Islands, Philippines.

Pteropodidae
Acerodon jubatus
Cynopterus brachyotis
Eonycteris spelaea
Macroglossus minimus
Ptenochirus jagori
Pteropus hypomelanus
Pteropus vampyrus
Rousettus amplexicaudatus

Megadermatidae
Megaderma spasma

Emballonuridae
Emballonura alecto

Rhinolophidae
Hipposideros ater
Hipposideros bicolor
Hipposideros diadema
Hipposideros obscurus
Hipposideros pygmaeus
Hipposideros coronatus
Rhinolophus arcuatus
Rhinolophus inops
Rhinolophus rufus
Rhinolophus virgo

Vespertilionidae
Miniopterus australis
Miniopterus schreibersi
Miniopterus tristis
Myotis muricola
Myotis macrotarsus

Murina cyclotis
Kerivoula whiteheadi
Scotophilus kuhli