

Natural history collections reveal species richness on a small isolated tropical island: the bats of Siberut

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SUPPLEMENTARY TABLE 1 List of online biodiversity database searched for bat specimens (query: ‘CHIROPTERA AND SIBERUT’; Supplementary Material 2).

Online Biodiversity Database	Download URL	Number of records	Data publishers ¹	Notes
GBIF	https://www.gbif.org/occurrence/download/0064330-200221144449610	115	WAM	
VertNet	http://portal.vertnet.org/search?q=siberut+chiroptera	32	USNM, NHMUK	One catalogue entry in NHMUK (4302899) was not located by the query of the NHMUK database but was located in VertNet, and four catalogue entries in NHMUK (3900025, 3900026, 3900029, 3900030) were located in NHMUK but not in VertNet.
USNM	https://collections.nmnh.si.edu/search/mammals/	9	USNM	Enter ‘siberut; chiroptera’ in the Keyword search field to find the record. Collection date for 252493 and 252492 were obtained from logbook image in the database
NHMUK	https://data.nhm.ac.uk/search/dangerous-single-lizard#	25	NHMUK	
WAM	https://data.museum.wa.gov.au/dataset/terrestrial-zoology	115	WAM	Click download on “Mammology (Mammals) Collection” within the page and filter the entries for “Siberut” in island field and “Chiroptera” in order field within the file (mammals-mapped_20180928.csv)

¹WAM, Western Australian Museum; USNM, National Museum of Natural History, Smithsonian Institution; NHMUK, National History Museum of UK.

SUPPLEMENTARY TABLE 2 The collated bat species records on Siberut from our field survey (2013) and searches of natural history collections, including their functional groups (FG): F, Frugivore, I, Insectivore, N, Nectarivore, IC, Insectivore-Carnivore, AI, Aerial Insectivore, UI, Understory Insectivore. Note that year 1980 indicates the WWF (1980) report and year 1992 indicates the systematic review by Corbet and Hill (1992), hence the relatively high species richness in these years.

Species	FG	Year of records														
		1903	1924	1927	1970	1976	1978	1979	1980	1991	1992	1993	1994	1995	2006	2013
PTEROPODIDAE																
<i>Cynopterus sphinx</i>	F		X	X			X		X		X				X	X
<i>Cynopterus brachyotis</i>	F				X							X	X			X
<i>Eonycteris spelaea</i>	N (F)														X	
<i>Macroglossus sobrinus</i>	N (F)								X	X	X	X	X	X		X
<i>Macroglossus minimus</i>	N (F)			X	X											
<i>Pteropus hypomelanus</i>	F			X					X		X					
<i>Pteropus vampyrus</i>	F								X		X					
<i>Rousettus amplexicaudatus</i>	F										X					
<i>Rousettus sp.</i>	F									X						
EMBALLONURIDAE																
<i>Emballonura monticola</i>	AI (I)	X	X	X					X		X		X		X	X
MEGADERMATIDAE																
<i>Megaderma spasma</i>	IC (I)					X			X		X					X
HIPPOSIDERIDAE																
<i>Hipposideros dyacorum</i>	AI (I)											X				
<i>Hipposideros galeritus</i>	AI (I)								X							
RHINOLOPHIDAE																
<i>Rhinolophus affinis</i>	AI (I)										X					
<i>Rhinolophus sp.</i>	AI (I)							X								
VESPERTILIONIDAE																
<i>Kerivoula hardwickii</i>	UI (I)			X					X						X	X
<i>Kerivoula papillosa</i>	UI (I)														X	X
<i>Kerivoula pellucida</i>	UI (I)															X
<i>Murina suilla</i>	UI (I)															X
<i>Myotis ater</i>	UI (I)										X					

<i>Myotis muricola</i>	UI (I)	X	X	X
<i>Philetor brachypterus</i>	AI (I)			X

SUPPLEMENTARY MATERIAL 1

In addition to the analysis mentioned in the main paper, we also estimated species richness from our standardized field survey using incidence-based richness estimators: i.e. ICE (Chao & Chiu, 2016), Chao 2 (Chao, 1987), improved Chao 2 estimator (Chiu et al., 2014), and Jackknife (Burnham & Overton, 1978), calculated through SpadeR v. 0.1.1. for incidence matrices at the 95% confidence interval (Chao et al., 2016). The results confirm no additional species expected (Supplementary Table 4). This analysis can be reproduced with data from Supplementary Material 3.

Additionally, we also classified our bat assemblages into two functional groups, frugivores and insectivores, based on the ecological classification of bat families in Kunz et al. (2011) (Supplementary Table 5). Using these groups, we conducted Pearson's Chi-squared test with Yates' continuity correction (Yates, 1934) implemented in R v. 4.0.0 (R Core Team, 2020) to test if the microhabitat where they were sampled (riverine or hilly) affect their abundance in our field survey and to test if natural history collections favour certain functional groups before and after the start of the 21st century. Although more insectivorous species were captured, its abundance per species is lower in both microhabitats (Supplementary Fig. 1), with no difference with the frugivorous bats in both microhabitats ($\chi^2 = 0.8233$, $df = 1$, $P = 0.3642$).

Myotis muricola X

Philetor brachypterus x

SUPPLEMENTARY TABLE 4 Non-parametric species estimate for bat assemblages on Pungut Field Station, Siberut, that are captured by standard protocol, based on incidence-based coverage estimator (ICE), Chao 2 estimators, and Jackknife estimators. The richness estimators are written as mean \pm standard error calculated from runs of rarefaction to the smallest sample size.

	Pungut Field Station		
	Harp traps	Mist nets	<i>Total</i>
ICE	6 \pm 0.45	5.21 \pm 0.89	
Chao 2	6 \pm 0.45	5 \pm 0.52	
Improved Chao 2 estimator	6 \pm 0.45	5.46 \pm 0.52	
1 st order Jackknife	6 \pm 0.45	5.95 \pm 1.36	
2 nd order Jackknife	5.08 \pm 0.45	6.85 \pm 2.30	
<i>Average species richness estimates</i>	5.82 \pm 0.08	5.69 \pm 0.24	11.51

SUPPLEMENTARY TABLE 5 Species collected from Pungut Field Station, with their functional groups.

SUBORDO/Famili	FAMILY NICHE	SPECIES	TOTAL
MEGACHIROPTERA			
Pteropodidae	Plant visitors that feed nearly exclusively on nectar and fruit; most species feed in forest canopies, but a few feeds in forest understories	<i>Cynopterus brachyotis</i>	20
		<i>Cynopterus sphinx</i>	11
		<i>Macroglossus sobrinus</i>	9
MICROCHIROPTERA			
Emballonuridae	Insectivorous: use primarily aerial hawking; have long narrow wings for swift flight; occasionally eat fruit	<i>Emballonura monticola</i>	11
Megadermatidae	Both insectivorous and carnivorous: primarily use perch hunting; consume arthropods and small vertebrates (e.g., fish, frogs, lizards, birds, mice, or other bats)	<i>Megaderma spasma</i>	5
Vespertilionidae	Primarily insectivorous: diverse foraging modes including aerial hawking (often using their tail membrane as a scoop), gleaning, trawling; a few species eat scorpions, fish, and small birds	<i>Kerivoula papillosa</i>	47
		<i>Kerivoula hardwickii</i>	8
		<i>Kerivoula pellucida</i>	4
		<i>Myotis muricola</i>	9
		<i>Murina suilla</i>	3
		<i>Philetor brachypterus</i>	1

SUPPLEMENTARY MATERIAL 2 This is a list of all bat individuals captured in Pungut Field Station from September-October 2013 using both standard and non-standard methods, available as a comma separated values file (SM1_pungutBats_allMethods_Aninta_et_al.csv) in the Supplementary Materials section at doi.org/10.1017/S0030605321001022..

SUPPLEMENTARY MATERIAL 3 This is a list of bat species records obtained from natural history collections available in online databases (Supplementary Table 1), specimen records from the Museum Zoologicum Bogoriense, and published species accounts not found in either online database or museum records (WWF, 1980; Corbet & Hill, 1992) available as a comma separated values file (SM2_naturalHistoryCollection_dataset.csv) in the Supplementary Materials section at doi.org/10.1017/S0030605321001022.

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