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Birds of mainit hot spring protected landscape, Nabunturan, compostela valley, Province Mindanao island, Philippines

Diza Joy Quitain[*1,2], Milton Norman Dejadena Medina[1,2], Richel Enclonar Relox[3], Emmanuel Pacheco Leaño[4]

[1]*Biology Department, Assumption College of Nabunturan, Compostela Valley, Philippines*
[2]*Research and Publication Center, University of Mindanao, Matina, Davao City, Philippines*
[3]*Misamis University of Science and Technology, Cagayan de Oro, Philippines*
[4]*Biology Department, Central Mindanao University, University Town, Musuan, Bukidnon, Philippines*

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Abstract

The present paper is part of the rapid biodiversity assessment in Mainit Hot Spring Protected Landscape (MHSPL), Nabunturan, Compostela Valley Province Philippines within the months of December 2012 and February 2013. Transect walk survey or visual encounter, mist netting, and live trapping methods were employed to 5 sampling sites namely, Sitio New Bohol (SNB), Sitio Saraban (SS), Sitio Pagtulian (SP), and Sitio Tindalo (ST). Total of (24) birds from 18 families are documented. More than half (13 of 24) are resident or 54%, 8 Philippine endemic (found throughout Philippines) 33%, 2 migrant 9%, and 1 species or 4% found only Mindanao Island or Mindanao endemic. Despite rampant mining and other socio-economic activities inside the MHSPL, there is still surviving species of aves in its remaining forests. Therefore, an urgent forest protection should be implemented especially in Sitio New Bohol and Sitio Tindalo where majority of endemic species are found.

***Corresponding Author:** Diza Joy Quitain ✉ joyful_meh@ymail.com

Introduction

The Philippines is very rich with different kinds of natural resources and its flora and fauna species are very diverse and unique. In fact it is one of the 17 mega-diverse countries in the world with very high endemism and species richness per unit area in the world in terms of numbers and percentage (Heaney *et al.*, 1998). But as the proportion of the forest decreases in the country, it greatly affects the survival and existence of species living in our Philippine forest. We believed that many of Philippine species cannot survive due to extensive socio-economic human activities in the forest. The loss of large numbers of wildlife simply indicates that the remaining faunal species will become endangered, and may lead to extinction if not well protected and conserved.

Mainit Hot Spring Protected Landscape is found at the northeastern region of the Philippine archipelago [N 7°30'00"; E 125°59'00"] located within the Municipality of Nabunturan, Province of Compostela Valley (Fig. 1). The whole range of MHSPL covers about 1,775 hectares including both the buffer and core zones. This area especially in the buffer zone is mostly planted with coconuts and other fruit-bearing trees. There are still remaining fragmented forest covers in remote areas such in Sitio Tindalo and Sitio New Bohol.

Since its declaration as Protected Area (PA) in the 1950s, there is no available taxonomic study of birds made in Mainit Hot Spring Protected Landscape. Faunal identification is necessary and important because it provides vital information and description of species and can be used by the policy makers in creating policies leading to the protection and preservation of MHSPL (Petterson, 2006). Hence, this study was conducted to record and identify the various inhabiting avifaunal species in MHSPL.

Material and methods

This study was conducted at MHSPL, Nabunturan, Compostela Valley Province from December 2011 to March 2012. Five (5) sampling sites were identified: Sitio New Bohol, Sitio Saraban, SitioPagtulian, and Tindalo (Fig. 1).

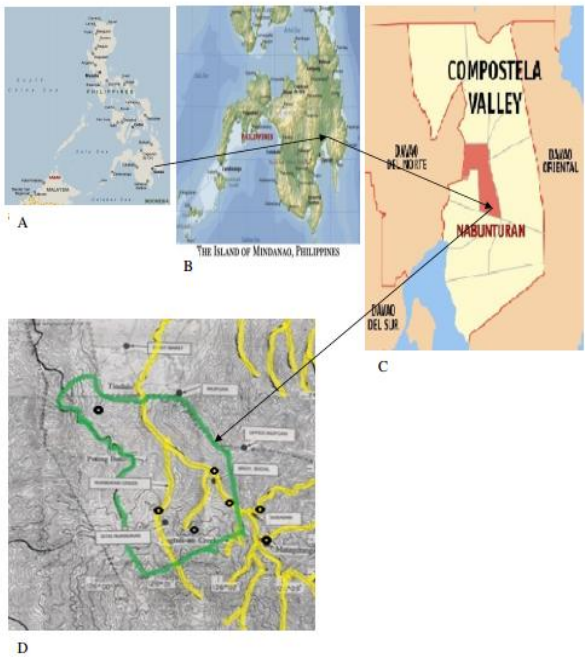

Fig. 1. Map of the Philippines (A), Map of Mindanao (B) Map of Compostela Valley Province showing the location of Nabunturan (C) Map of the study area-MHSPL

Sampling

The sampling was done on December 2011 up to December 2012 at 4 sites in MHSPL: Sitio New Bohol, Sitio Saraban, Sitio Pagtulian, and Sitio Tindalo.

Design

Transect walk following a two-kilometer transect line was established with 20 interval points at 100 meters. Opportunistic sampling and visual encounter (Relox *et al.*, 2011) was also used and bio-acoustics were employed (Derlindati and Caziani, 2005) to increase the chance of sightings.

Methods

The mist nets were placed at 10 meters intervals in each sites and in accordance to their assumed flight paths such as clearing, along ridges or along river banks (Heaney *et al.*, 1998) and strategically established along the forest edge, flyways, foraging areas and forest interior (Relox *et al.*, 2011).

The nets were left open after establishing them checked every 30 minutes. All birds captured were retrieved from the mist nets for recording of their morph metrics and identification purposes.

Morph metrics in birds such as bill length (Bl), tarsus length (Tl), wingspan (W) and total length (TL) were measured using a caliper. Gender of each species was also noted. Morphological characteristics of each bird species were determined and compared to the book of Kennedy *et al*. (2000) and Heaney *et al*. (2010). Statistical analysis:

Result and discussion

The recent survey revealed Twenty four (24) birds from 18 families are documented comprising of 8 Philippine endemic, 1 Mindanao endemic, 2 Migrant, and 13 residents from 4 sites surveyed: Sitio New Bohol, Sitio Saraban, Sitio Pagtulian, and Sitio Tindalo. Table 1 shows all bird species documented in MHSPL.

Table 1. List of birds in MHSPL.

Family	Species	Local Name/ English Name	Endemism	Geographic distribution
Accipitridae	*Accipiter virgatus*	Sakbit	Least Concern	Phil. Endemi
Alcedinidae	*Alcedoargentata*	Silvery Kingfisher; Kibid	Rare and Vulnerable	Phil. Endemi
Apodidae	*Callocalia troglodytes*	Pygmy Swiftlet	Least Concern	Phil. Endemi
Columbidae	*Phapitreron leucotis*	White-eared brown dove; Alimocon (Vis)	Least Concern	Phil. Endemi
	Chalcophalps indica	Common emerald dove; Manatad (Vis)	Least Concern	Residen
Corvidae	*Corvus macrorhynchos*	Uwak; Large Billed crow	Least Concern	Residen
Cuculidae	*Centropus bengalensis*	Lesser Coucal; Kokok	Least Concern	Residen
	Centropus viridis	Philippine Coucal; Kokok	Least Concern	Phil. Endemi
Dicaeidae	*Dicaeum trigonostigma*	Orange Bellied Flowerpecker; Tikbay	Least Concern	Residen
	Dicaceum australe	Red-keeled flowerpecker; Panagoto (Vis)	Least Concern	Phil. Endemi
Estrildidae	*Lonchura leucogastra*	White Bellied Munia; Maya	Least Concern	Residen
	Lonchura malacca	Chestnut Munia	Least Concern	Residen
Hemiprocnidae	*Hemiprocne comata*	Whiskered treeswift; Sayaw	Least Concern	Residen
Hirundinidae	*Hirundo tahitica*	Pacific swallow; Balinsasayao (Vis)	Least Concern	Residen
Laniidae	*Lanius cristatu*	Brown shrike; Tibalas (Vis)	Least Concern	Migran
Meropidae	*Meropsviridis*	Blue-throated Bee Eater; Purok-purok(Vis)	Least Concern	Residen
Motacillidae	*Motacilla flava*	Yellow wagtail	Least Concern	Migran
Nectariniidae	*Nectarinia jugularis*	Olive backed sunbird; Tamsi	Least Concern	Residen
	Nectarinia sperata	Purple throated sunbird; Tamsi	Least Concern	Residen
Psittacidae	*Bolbo psittacuslunulatus*	Guaiabero; Batotok (Pil)	Least Concern	Phil. Endemic
Pyncnonotidae	*Pycnonotus goiavier*	Yellow Vented Bulbul; Pirok-pirok	Least Concern	Residen
Strigidae	*Otus mirus*	Mindanao Scops Owl	Near threatened	Mindana Endemi
Sturnidae	*Aplonis minor*	Short Tailed Glossy Starling; Galansiang (Vis)	Least concern	Philippin Endemi
	Aplonis panayensis	Asian Glossy Starling; Galansiang (Vis)	Least concern	Residen

The recent survey revealed more than half (13 of 24) are resident or 54%, 8 Philippine endemic (found throughout Philippines) 33%, 2 migrant 9%, and 1 species or 4% found only Mindanao Island or Mindanao endemic (Fig. 2).

This data is relatively lower compared to avifaunal species documented by Relox *et al.* 2011 in Mt. Hamiguitan Range Wildlife Sanctuary in Davao Oriental with 20 Philippine endemic and 10 Mindanao endemic species.

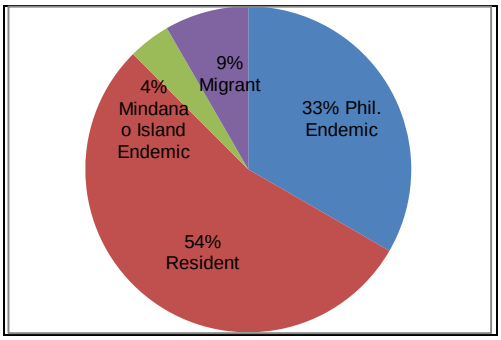

Fig. 2. Avifaunal composition of MHSPL.

Perhaps the primary reason of minimal bird species in MHSPL is the rampant clearing of forests or timber harvesting, extensive mining where mostly used explosives that greatly disturbed bird species and perhaps causes imminent migration, and conversion of forests into agricultural purposes. Hence "kaingin" or burning of forests is very visible to almost all areas of MHSPL.

Reflected also in the data that mostly small species of resident birds dominated theopen areas of MHSPL such as *Hirundo tahitica* (Balinsasayaw), *Aplonispan ayensis* (Galansiang), *Lonchura leucogastra* (Maya) and *Nectarinia*s pecies (Sun birds). Relatively large and Philippine endemic species such as *Otusmirus* (Mindanao Scops Owl) and *Centropus viridis* (Kokok) are seldom seen in the area. This also conform to the studies of Cooke (1980); Humphrey *et al.* (1987), and Holmes *et al.* (1993) that generally, bird species vary in tolerance levels where large species seem less tolerant of human disturbance than small ones.

Table 2. List of species captured/seen in sampling sites.

Family	Species	GD	Area captured or seen			
			SNB	SS	SP	ST
Accipitridae	*Accipiter virgatus*	PE	X			
Alcedinidae	*Alcedo argentata*	PE				X
Apodidae	*Callocalia troglodytes*	PE	X			X
Columbidae	*Phapitreron leucotis*	PE				X
	Chalcophalps indica	R				X
Corvidae	*Corvus macrorhynchos*	R	X			
Cuculidae	*Centropus bengalensis*	R	X	X		
	Centropus viridis	PE	X			
Dicaeidae	*Dicaeum trigonostigma*	R		X		
	Dicaceum australe	PE		X	X	
Estrildidae	*Lonchura leucogastra*	R		X	X	X
	Lonchura malacca	R		X		X
Hemiprocnidae	*Hemiprocne comata*	R		X	X	
Hirundinidae	*Hirundo tahitica*	R		X		
Laniidae	*Lanius cristatu*	M	X	X		
Meropidae	*Merops viridis*	R				X
Motacillidae	*Motacilla flava*	M	X	X		
Nectariniidae	*Nectarinia jugularis*	R	X	X	X	X
	Nectarinia sperata	R	X			
Psittacidae	*Bolbo psittaculunulatus*	PE				X
Pyncnonotidae	*Pycnonotus goiavier*	R	X	X	X	X
Strigidae	*Otus mirus*	ME	X			X
Sturnidae	*Aplonis minor*	PE	X	X	X	
	Aplonis panayensis	R	X	X		
	Total		13	13	6	11
	Percentage		30.23	30.23	13.95	25.58
	No. of Phil. endemic		4	2	2	4
	No. of Min. endemic		1	0	0	1

Legend: PE-Philippine endemic, R-Resident, M-Migrant; ME-Mindanao Endemic.

One of the most important data in the study is the discovery of *Alcedo argentata* (Silvery Kingfisher) which is assessed as 'Vulnerable' by IUCN Red List of Threatened Species (IUCN Red List of Threatened Species, 2016-1). This species is only found in the remaining forest fragment at Sitio Tindalo, one of the remaining relatively undisturbed areas in MHSPL.

Table 2 shows that Sitio New Bohol and Sitio Saraban has the highest number of species richness with 13 species (30.23%), followed by Sitio Tindalo with 11 species (25.58%) and Sitio Pagtulian with 6 species (13.95%). However based on endemism, Sitio New Bohol and Sitio Tindalo has the highest number of Philippine endemic species. The following Philippine endemic species are: *Accipiter virgatus, Alcedo argentata, Callocalia troglodytes, Phapitrer onleucotis, Centropus viridis, Dicaceum australe, Bolbo psittacuslunulatus,* and *Aplonis minor*. The only Mindanao endemic species recorded is *Otus mirus* (Mindanao Scops Owl) found only in Sitio Tindalo and New Bohol.

The relatively high number of endemic species in Sitio New Bohol and Sitio Tindalo compared to Sitio Saraban and Sitio Pagtulian is the presence of fragmented forests which serve as habitat and source of food is still available in these areas. Sitio New Bohol although started to be mined by the local villagers, still small forest cover can be seen in the area. Sitio Tindalo is the remaining area in MHSPL where secondary forests thrive which we presumed the last haven of endemic bird species in MHSPL. Hence immediate conservation efforts especially forest protection to these areas, Sitio New Bohol and Sitio Tindalo is urgently needed.

Conclusion

Despite the rampant mining and other socio-economic activities inside the MHSPL there is still good number of avifaunal species surviving in its remaining forests. This is evident in the presence of some Philippine and Mindanao endemic species including the *Otus mirus* (Mindanao Scops Owl) and the rare and vulnerable *Alcedo argentata* (Silvery Kingfisher) found only in Sitio Tindalo.

Therefore, an urgent forest protection should be implemented especially in Sitio New Bohol and Sitio Tindalo where majority of endemic species are found.

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