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Taxonomy and Biometrics of *Tarsius syrichta* (Tarsier) at Barangay Bayanga, Cagayan de Oro City

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ABSTRACT

The objectives of the study were to capture tarsiers in Cagayan de Oro City, to assess the number of individual tarsier, to identify its morphological and biometric characteristics, and to identify the possible threats of its existence. The scientific study and exploration was conducted at Sitio Tagbocboc, Barangay Bayanga an hour's ride from the city proper of Cagayan de Oro. It was purposively selected after making use of the Plot Sampling Method (PSM) to quantify collection of tarsiers and qualify habitat types as agricultural land, partially cultivated land and forested area. Another method used was Cruise Sampling Technique (CST). This technique applies random collection of ground and arboreal mammals like the Tarsiers. The results of the study revealed that: 1. the tarsier caught was morphologically different from the Tarsier in Bohol; 2. the taxonomic classification of tarsier found here in Cagayan de Oro is ***Tarsius syrichta*** *of the family of Tarsiidae; 3. tarsiers in Cagayan de Oro are not only vulnerable but are also greatly threatened to become an endangered specie in its habitat; 4. Illegal logging, "kaingin", hunting and conversion of forest into agricultural land affect the biodiversity and the population of the vulnerable and threatened species of Tarsiers.Keeping wide variety of plants for* ***Tarsius syrichta*** *locally known as "maomag" is essential not only for mammals but also for man's future which is dependent on biodiversity. It will be a great pride of the Kagay-anon and Cagayan de Oro as another home of the world famous smallest primate in the world. However, that honor is always coupled with an enormous challenge and that is, the responsibility of protecting and conserving this unique creature – the tarsier.*

INTRODUCTION

The primate was captured last April 14 at 5:00 p.m. in Sitio Tagbocboc, Barangay Bayanga one kilometer away from the Macahambus Gorge. Later that day, the city council during their regular session approved an ordinance banning the hunting of tarsiers. The DENR has declared the primate as an endemic species and belongs to the threatened category due to hunting and habitat destruction. This intriguing news may post a question, "is there really tarsier in the city of Cagayan de Oro?" Nevertheless, why do we bother ourselves in this issue? Why do we need to know about Tarsier and be inquisitive about biodiversity?

Biological diversity or biodiversity encompasses all species of plants, animals and microorganisms and the ecosystems and ecological processes of which they are part as cited by Wright, P. (1990). Clearly, tarsier is a part of this diversity of life. At present, only a few Philippine Tarsiers can be found in Bohol, Samar, Leyte and isolated places in Mindanao and is variously known to the natives as *mamag, mago, magau, maomag, malmag* and *magatilok-iok*. Because this species is only found in a small area of the country it is crucial that we conserve its environment. The destruction of natural resources in the Philippines continues to affect its inhabitants such as Tarsiers. The indigenous land animals of this part of the world are quickly being depleted.

STATEMENT OF THE PROBLEM

City Mayor Vicente Y. Emano immediately ordered the release of Tarsier captured last April in Sitio Tagbocboc, Barangay Bayanga, this city, shortly after gladly cradling the primate at his office (PIA, Press Release, April19, 2006). As the local news papers, radio and television featured this surprising discovery, many people if not all wondered and even questioned its validity if the tarsier was really captured from its natural habitat or it was just a tamed pet taken from Bohol or any other region but not certainly from this city.

The general objective of the study is to capture tarsier in Cagayan de Oro city.
Specifically, it attempts to assess the following:

1. Number of individual species of tarsiers found in Cagayan de Oro City;
2. Morphological and biometric characteristics of tarsiers;
3. Taxonomic classification of tarsier; and
4. Possible threats to its existence.

METHODOLOGY

In doing this research, the authors chose a suitable design to achieve the purpose of the study. This chapter discusses in detail the Research Design, Setting, Sampling Techniques, Data Gathering Procedure and Research Instruments.

Research Design

The designed employed in the study were exploratory and descriptive type of research to investigate the report about the existence of Tarsier in Cagayan de Oro City and their natural habitat.

Research Setting

The scientific study and exploration was conducted at Sitio Tagbocboc, Barangay Bayanga an hour ride from the city proper of Cagayan de Oro from August 12,13 and 17, 2006. The study area was then divided into three study stations at the hills

of Sitio Tagbocboc: Station 1 was established at the agricultural land area; Station 2 at the partially cultivated forest; and the Station 3 at the midst of the forest.

Sampling Techniques

To determine the study area, the research team decided to make used of *Plot Sampling Method (PSM)* for which it employs the used of quadrants to quantify collection of tarsiers and qualify habitat types as agricultural land, partially cultivated land and forested area. Likewise, *Cruise Sapling Technique (CST)* from which it applies a random collection of ground and arboreal mammals like Tarsiers, all of these were adapted from Quick Guide to Different Mammalian Sampling Techniques 2006.

Ethnobiological Method

Written evidence and proofs about tarsier in the city are difficult to find thus, this method was used to gain information about the concern of the study. Ethnobiological method is a non-extractive manner of collecting tarsier and less-costly for it uses only indigenous knowledge of the local community through casual interview. This serves as guidelines for locating and eventually catching the sample species of tarsiers.

Setting of Plots

The sampling method in this study is plotting and employs the use of quadrants. The manner of collection of the species is extractive type which is drawing out lines and requires several people to conduct the plan. We used 100 x 100 m^2 imaginary lines from where the team concentrates its exploration.

Cruise Sampling Techniques

This is the next method used after setting of the three study stations. It applies random collection of grounds and arboreal form species as the researcher cruises the whole plot from end to end. It employs anything that could be encountered inside the perimeter. The manner of collection is extractive and can be done by one person anytime of the day.

Biometrics

Biometrics or otherwise known as morphometrics are important data used to describe the physical attributes of the tarsier. Animal species could be identified based on their known range of body measurements. These include: Total length (TL); Tail length (TL); External ear (EAR);Eyes diameter (ED) ; Head length (HL); Body weight (BW) and sex. .All measurements were taken with the used of ruler and spring balance.

Taxonomic Classification

The sample species was identified with the help of our adviser Prof. Edgar R. Vasallo,Jr and validated by Mr. Edgar Cañete, the officer of the Department of Wildlife Protection of the Department of Environment and Natural Resources (DENR). The

sample species was identified with the aid of the different documents and data brought during the research.

Validation

The team used digital camera and video camera to take pictures of the three different study stations, the individual species of Tarsier as it was being sighted, captured, and measured and the existing threats of Tarsiers were all taken for proper documentation. All of these data aided the researcher to classify taxonomically the Tarsier. However, the basic classification made must be authenticated and be validated by the expert and in authority- the DENR.

RESULTS AND DISCUSSIONS

This chapter imparts the presentation of the findings, analysis and interpretation of the resulting data in systematic arrangement to address the problems of the study.

Problem 1. How many Tarsiers can be found in Cagayan de Oro City?

Table 1. The Number of Individual Species of Tarsier Caught at the Study Stations

STATIONS	LAND AREA	NUMBER OF TARSIERS
1	Agricultural Land Area	0
2	Partially Cultivated Area	0
3	Forested Area	5

As shown in Plate 1, Station 1 was an agricultural land planted with hundreds of mango trees and corn for the commercial purposes. In this type of land, there was no Tarsier found nor other ground and arboreal mammals in the station as presented in Table 1. One of the biggest factors that attributes to its result, is that the ecosystem was destroyed in the sense that the trees were being cut down to convert it into agricultural land thus making the tarsiers homeless in that area. The Tarsiers need the trees for them to dwell because it is their natural habitat for them to survive. The variety of trees also serves as a protection to the Tarsiers from other wild animals that could harm or even kill them. In addition, the food chain seems fragmented and it does not satisfies and support the population of Tarsiers for they need a variety of insects. As cited by Jenskins, P. 1990, tarsiers are nocturnal creatures, being active and looking for food during the night, and preying mainly on insects.

The partially cultivated forest area which was the station 2 of the study as shown in Plate 2, was not totally altered and around 60% of the forest cover remains. Human interventions like "kaingin" system, slash and burn method of farming and

cutting of trees for commercial firewood could be the disturbing factors of the habitat of the tarsiers and making them moved to other more secure area that they will live without human disturbances. Unfortunately, there was again no Tarsier found on that area (Table 1).

The deeper or inner part of the forest was the Station 3 where it was least disturbed though some parts were slightly exploited. Compared to station 1 and 2, Station 3 has countless large and tall stands of trees and shrubs with peculiar calls of diverse animals and that even light would hardly reach the ground. We even had a difficulty of walking and climbing into the forest for it does not have human trails, so this may only proved that this place is the least disturbed (Plate3). Unlike the other stations where people always pass by which might threatened the population of Tarsiers. In Station 3, there were 5 tarsiers found clinging and leaping towards different directions, some were in pairs and the rest were in solitary. Luckily, one tarsier was caught with the help of our tour guide for the primate was trapped that he ended up in the hands of the researchers.

Problem 2. What morphological and biometric characteristics do Tarsiers have?

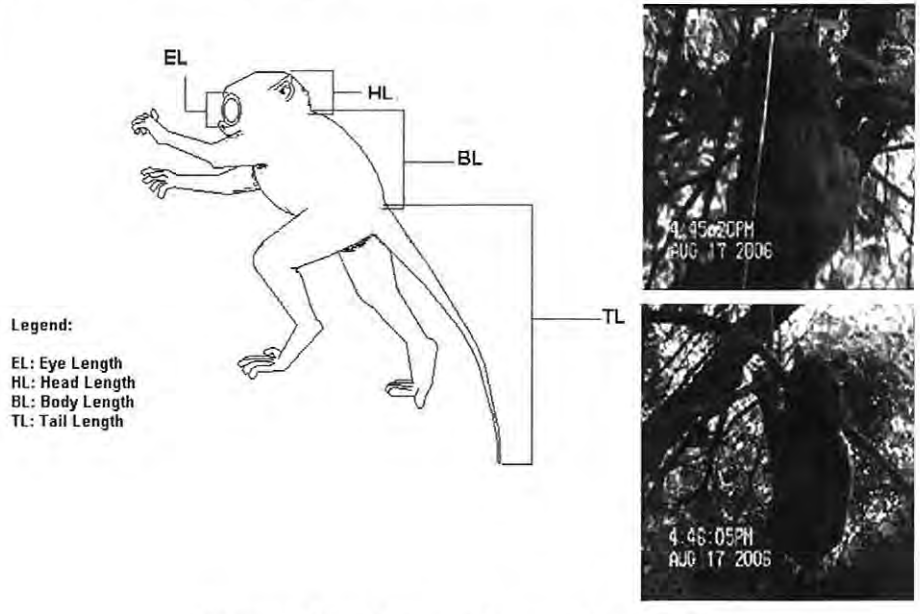

Figure 2 Morphology of Cagayan de Oro's Tarsier

The morphological attributes of Tarsier found at the Station 3 as shown in Plates 13-16: the head is very rounded, with large slender, almost entirely hairless ears, and very large eyes; the tarsier's front legs are short, but, as the name implies, the hind legs are very long; the toes and fingers are enlarged to form flat soft discs which bear grooming claws; the thumbs and ig toes are opposable; total length is 41.7 cm; body is 13.7 cm; and in addition

is the tail which is 22.4 cm; head length is 5.6 cm; and weight is 180 g. What we caught was a male Tarsier.

Table 2 Biometrics of Cagayan de Oro's Tarsier

Measurement	Eye	Head	Body	Tail
LENGTH	1.0 cm	5.6 cm	13.7 cm	22.4 cm
MASS				
		180 g		

Problem 3. What taxonomic classification does a Tarsier belongs?

Though the Philippine tarsier, **Tarsius syrichta** is an understudied creature compared with other Tarsier species in Southeast Asia, three subspecies are presently recognized: **T. syrichta syrichta** from Leyte and Samar, **T. syrichta fraterculus** from Bohol and **T.syrichta carbonarius** from Mindanao. As cited by Richard A. an expert on tarsiers, said "This perspective may change as scientists are beginning to study the variation found in Tarsiers throughout the Philippines."

To identify the taxonomic classification of Cagayan de Oro's Tarsier would be the toughest task of the team for we don't have enough taxonomy book or journals for Tarsiers and it needs an expert or professionals to attest its findings. To answer this problem, the team e-mailed the Philippine Tarsier Foundation in Bohol for answers and attached photographs of the Cagayan de Oro's Tarsiers, but the Foundation has yet to reply.

Finally, the Department of Environment and Natural Resources (DENR) gave their statement, that there is an urgent need to conduct extensive studies about Cagayan de Oro's Tarsiers' morphology, range, ecology, locomotion, social behavior, vocal communication, olfactory communication, visual communication, tactile communication, and reproduction, among others to facilitate the process its taxonomic classifications. Mr. Edgar Canete of DENR added, "it is difficult to say with certainty if the tarsiers in Bohol and the Tarsiers in Cagayan de Oro are the same or different. Whether the differences represent specific level differences (different species) or subspecific differences (subspecies) is based on numerous biological factors such as whether the tarsiers from Bohol and Cagayan de Oro can reproduce together, whether they respond to each other's vocalizations, chromosomal numbers, etc." he said. On what to do with the Tarsiers captured in the city, Prof. Edgar R. Vasallo,Jr, research adviser said "they should be returned to as close to where they were captured as possible."

As to taxonomy of tarsier found in Cagayan de Oro, experts safely and generally classified as the following:

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Subclass: Eutheria
Order: Primatea/Primates
Family: Tarsiidae
Genus: Tarsius
Species: *syrichta*

Status: Vulnerable / Threatened
Location: Sitio Tagbocboc, Barangay Bayanga, Cagayan de Oro City
Habitat: The Cagayan de Oro's Tarsier was found in small trees in forests and in areas that offer them protection like tall grasses, bushes and bamboo shoots. Their natural habitat is the jungle, leaping from tree to tree with relative ease.
Problem 4. What are the possible threats for Tarsiers extinction in Cagayan de Oro City?

Threat to biodiversity is the loss and extinction of species. This topic is better known and publicized than the farmland issue, and many organizations are working towards the preservation of wild animals. However, it is important to understand that we need to pay as much, if not more, attention to reductions in species as extinction's. We often wait until a species is highly endangered before helping, at which point it is often too late. Endangerment of wildlife animals such as Tarsiers occurs directly by humans, such as:

Illegal Logging

As shown in Plates 12 and 13, the trees are being cut down thus threatening the habitation of the tarsiers. Tropical deforestation is also pointed as the main force extinction crisis. The trees are a part of the Tarsier's habitat because it is where they sleep and rest on its branches during daytime and hunt during night time. One reason why loss of tropical forest has a dramatic effect on species is that many organisms living in the forest are endemic to a single area. This ratify makes the species particularly vulnerable to extinction.

Conversion of Forest to Agricultural Land

In most parts of the study area, agriculture (Plate1) is the primary driver of land use change. Much of the pressure to convert forest agricultural uses comes from increasing population growth and development demands. More land may be needed to provide food and commodities, or to enable division of property into smaller particles for new families. New communities and population also requires the development of new or improved transportation, infrastructure. Although not to the extent that forest are converted to agricultural land. Orleans, G. in 1994 pointed, that conversion of forest to other uses also occurs because local forest owners and users may perceive or actually receive a greater value and return on investment, for uses other than forest land. Use

conversion affects both the amount and special pattern of forest habitat, which in return can affect the ecological function and future development of remaining forest lands.

Kaingin System

The slashing and burning of trees to convert forest land into agricultural land would surely causes a disturbance in biodiversity and lessen the population of diverse animals living in that certain habitat and tarsier is no exception to this human intervention.

Hunting

A large number of species are also threatened the loss of the earth's biological resources. It is one of the most pressing because even the small or young animals have no escape from the hunters and even the endangered animals are being hunted for food. Though it's not yet very evident that there is hunting activity in the study area, but this might be happening soon for one report that a farmer caught Tarsier for pleasure or keeping it as a pet. Poaching is a process of hunting certain animals to be used for the food and accessories of every individual. Other reason of the earth's imbalance in environmental and developmental issues is illegal trading of any kind of animals. Illegal trading means that people hunt gradually any animal species to be sold commercially without the permission of the DENR or any government department of the Philippines whom concern about this issue. Threats mentioned above will not be far from the truth for it is gradually happening now in the area where considerable population of tarsier was surprisingly found.

To conserve wildlife is also conserving biodiversity but some people may not care about what they are doing to the environment even if it will affect seriously the biodiversity. For whatever things they do it's always for their own advantage without thinking what is the ill-effects on biodiversity. Illegal and rapid rate of cutting of trees in Sitio Tagboc-boc, Barangay Bayanga will undoubtedly denude the forest sooner or later which affects the conservation of Tarsiers here in the city. The conservation of Tarsiers is really important because this species are considered vulnerable or perhaps an endangered species because of the destruction of their habitat.

In order to conserve the Tarsiers, the city government must adapt two programs of conservation effort which are the on sight conservation program and off sight conservation program. On sight conservation program is a program which states that the area will be declared as a tarsier sanctuary or declare the area as a protected area and the off sight conservation program is the conservation breeding program. Under the on sight and off sight conservation programs is the **Republic Act. 9147 Wildlife Conservation Act**, an act providing for the conservation and protection of wildlife resources and their habitats, appropriating funds therefore and for other purposes. This law helps preserve the wildlife in our country and consequently our own biodiversity. **Republic Act 9147** ***Conservation Breeding or Propagation of Threatened Species*** shall be encouraged in order to enhance the tarsier population in its natural habitat. It shall be done simultaneously with the rehabilitation and/or protection of the habitat where the captive-

bred or propagated species shall be released, reintroduced or restocked. This section tells us that if the species is already endangered or becoming extinct, we must propagate the species or help it multiply so that it will not be extinct anymore and protect its habitat. The R.A. 9147 should be followed properly in order to conserve the wildlife specially the tarsier because these species is vulnerable of becoming endangered if not yet for its extinction.

Chapter V , Section 28 of R.A. 9147, *Penalties for Violations of this Act* states, that for any person who undertakes illegal acts under paragraph (a) of the immediately preceding section to any species as may be categorized pursuant to this Act, penalties and/or fines shall be imposed; (a) imprisonment of a minimum of six (6) years and one (1) day to twelve (12) years and/or a fine of One hundred thousand pesos (P100,000.00) to One million pesos (P1,000,000.00), if inflicted or undertaken against species listed as critical.

The participation of the local community is also significantly needed because if they will not participate, what's the use of these Republic Act? The people should have enough knowledge and strictly follow the R.A. 9147 in order to protect and conserve our own Cagayan de Oro's pride-the Tarsier.

The discovery of tarsiers in our city will foster and pursue the enrichment of host communities and satisfaction of visitors but not jeopardizing the lives of Tarsiers. Responsible Eco-tourism includes programs that minimize the adverse effects of traditional tourism on the natural environment, and enhance the cultural integrity of local people. Eco-tourism is considered the fastest growing market in the tourism industry, according to the World Tourism Organization with an annual growth rate of 5% worldwide and representing 6% of the world gross domestic product (http://www.haribon.org.ph/wildlife/tarsier.htm).Therefore, in addition to evaluating environmental and cultural factors, initiatives by the local government and other agency providers to promote the creation of tarsier sanctuary in the city as well as the economic opportunities for local communities must be an integral part of the city Eco-tourism.

The city of Cagayan de Oro has a rich natural resources in which is need to be protected and conserved in order for us to have a balance ecosystem however, biodiversity crisis has been stunted aside and marginalized as one of the primary emerging economic issues that totally affect our economy and basically our natural resources. Can we afford to lose potential sources of food, medicine, fire, energy or industry? Keeping the widest variety of plants and animals like **Tarsius syrichta** or locally known "maomag" is essential for our future depend on biodiversity. It will be a great pride of "Kagay-anon" as it raises the banner that Cagayan de Oro is a new home of the world famous if not the smallest primate in the world, however, that honor is always equaled with enormous challenges-the responsibility of protecting and conserving this unique creature of God- the **TARSIER.**

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

The study of tarsier derived the following findings:

1. The exploration and screening of the place revealed, that there were only 5 individual species of Tarsier observed in the study area.
2. The biometrics showed that the Tarsier here in Cagayan de Oro was morphologically bigger from the Tarsier of Bohol and other places.
3. The taxonomic classification of Tarsier revealed that its scientific name is **Tarsius syrichta** from Tarsiidae family, which is commonly named as Tarsier and locally known as "Maomag".
4. The following were considered as threats for extinction of the tarsier in Cagayan de Oro: Illegal logging; Kaingin system; Hunting; and Conversion of Forest into Agricultural land in the different hills of Sitio Tagbocboc, Barangay Bayanga, Cagayan de Oro City.

CONCLUSIONS

There are tarsiers in Cagayan de Oro and they are not only vulnerable but threatened and even leading to become an endangered species for its few remaining population in its natural habitat. Illegal logging, "kaingin" system, hunting and conversion of forest into agricultural land can be causal factors affecting the biodiversity and the population of the vulnerable and threatened species of Tarsiers.

RECOMMENDATIONS

Based on our findings of the study, we recommend the following:

1 Human negative impacts at Sitio Tagbocboc, Brgy. Bayanga must be minimized or even eliminated so that wildlife will be protected and conserved especially those rare and threatened species like **Tarsius syrichta**;

2. Biodiversity on private lands in Sitio Tagbocboc, Barangay Bayanga must be protected provided landholders manage their properties in an ecologically sustainable way;

3 There must be enough funding support especially from the local government to conduct field investigations, library research, data analysis and storage for its further taxonomic classification of **Tarsius syrichta** in the city; and

4 The local government should legislate and strongly implement city ordinances to protect and conserve the Tarsier and making Sitio Tagbocboc, Barangay Bayanga as **Wildlife Protected Area** and be officially recognized as **Tarsier Sanctuary in Cagayan de Oro City**.

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