PHOLCID SPIDER DIVERSITY AND ITS MICROHABITATS IN BOHOL BIODIVERSITY COMPLEX (BBC) BOHOL, PHILIPPINES

College of Agriculture and Natural Resources
BOHOL ISLAND STATE UNIVERSITY
Zamora, Bilar, Bohol

JEMIE T. DISMAS

June 2022

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In Partial Fulfillment
of the Requirements for the Degree
of Bachelor of Science in Forestry

JEMIE T. DISMAS

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APPROVAL SHEET

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ABSTRACT

Pholcids are the most common web-building spiders. They live in a wide range of environments, from leaf litter to tree canopies, and numerous species can be found in caves and in close proximity to humans. They are one of the most species rich spiders but despite this, they are less studied, hence this study was conducted to determine the pholcid spider species diversity and its habitats in Bohol Biodiversity Complex. The study employed opportunistic approach to sample out pholcid species in the established 10m X 10m sampling plots. The study was able to document 37 individuals under two species belonging to the Family Pholcideae. The *Aetana* sp. was the most dominant species in the area which was highly observed in six out of ten plots. Rainforest has the highest species diversity at H'= 0.69, followed by PFEN with H'= 0.68 and Dipteropark site was the least with H'=0.27. The diversity value of the tree habitat was less diverse. Moreover, *Aetana* sp. tends to be associated with soil temperature and air temperature while the *Crossopiza lyoni* is associated with ground cover and vegetation cover. These findings indicate the importance of strengthen habitat protection and conservation measures of the area.

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Rationale

In many tropical and subtropical areas of the world, pholcids are the most common web-building spiders. They live in a wide range of environments, from leaf litter to tree canopies, and several species can be found in caves and in close proximity to humans. (Huber, 2001).Diversification analyses clearly show that microhabitat is a significant element determining pholcid spider diversification patterns (Eberle and Dimitrov, 2018). A new genus comprising 17 new species and three species moved from Spermophora has been identified (Hentz, 2000).Pholcids may turn out to be one of the most varied spider families, according to current estimates (Huber, 2003).Pholcidae is one of the most species-rich spider families (World Spider Catalog, 2018), and it includes some of the most well-known spiders, such as daddy long-legs and cellar spiders, which are found in homes all over the world. Over the last few decades, a large quantity of morphological, taxonomic, behavioral, and biogeographic data on pholcids has been collected and published (Jakob, 2004). Pholcidae spiders have a wide range of ecological adaptations and can be found in a variety of habitats, from deserts to humid tropical forests (Huber, 2005b)

They like gloomy environments such as caves, rock fissures, and crevices (Huber, 2000). They can be found in leaf litter, webs between buttresses, small holes in trees or fallen logs, and the undersides of huge leaves in forested

regions (Huber, 2005b). This makes them tough to spot and possibly capture for their major predators (Morano E, 2013). One of its frequent names is "daddy long legs spiders," because of their long, slender legs. The Pholcidae family is the ninth biggest spider family, with a total of 79 genera and 1458 species (Huber, 2015). Spiders have a terrible standing among the general public, as they are thought to be ugly, hairy, brown, and toxic. There are stories about them laying eggs in human skin, frequenting airport toilet seats, and crawling into your mouth as you sleep. Spider misinformation is common in the popular media and on the Internet, leading to erroneous perceptions and bad feelings about spiders. However, despite their negative connation, spiders offer intrigue and mystery and can be used to effectively engage even arachnophobic people into arachnid-based discussion and activities.Pholcid is a spider family with a large number of species. Pholcid spiders, on the other hand, are poorly studied in Southeast Asian nations such as the Philippines. Pholcids were collected using a combination of aerial-hand searching and ground-hand searching methods. In this study, ecology of pholcid spiders were investigated in selected sites to determine the microhabitat utilization of leaf-dwelling and forest ground-dwelling pholcids.

Literature Background

Pholcid Spiders

Arachnids, according to (Huber, 2005) are a type of arthropod that includes scorpions, mites, and ticks. Spiders are found in ecosystems all over the world and number over 45,000 species. Spiders with a cartoonish butt, spiders that can jump on command, and cannibal spiders that look like pelicans are among the creatures featured. The spider family Pholcidae includes a huge variety of mostly tropical web-weaving spiders and is one of the world's most diverse and dominant spider families. So far, only morphological data has been used to examine the phylogeny of this family (Huber, 2005). Analyses of ancient microhabitat demonstrated a high rate of evolution. Numerous shifts from near-ground habitat to leaves and back were discovered among the largest subfamily Pholcidae. Taxa that live in leaves and big enclosed places have a higher rate of diversity than those that live on the ground. In leaf- and space-dwelling species, shifts in specification rate were discovered.

Their research yielded one of the most extensive phylogenies for a major spider family, as well as a framework for future research into pholcid spider biology (Krausman, 1999). Individual spiders can either share webs or live alone, and they switch between the two techniques frequently. Size and recent feeding success influenced spiders' preferences. Food-deprived spiders were more likely to depart their webs and construct their own, supporting the theory that spiders employ a win-stay/lose-shift strategy. (Briceno, 1983). When spiders were provided extra food in the field, they were more inclined to stay in webs overnight

(Elizabeth M Jakob, 2004). Males are dominating, yet they regularly hand over prey to females; partnered males of at least two species consume less food than lonely males. Because paired females' feeding rates are similar to those of solitary females, this 'chivalrous' behavior is likely to induce the female not to leave and thus make her defendable (Eberhard and Briceno, 1983). Because a habitat may be chosen for cover availability, competition, or predation, species abundance is dependent on the microhabitats present in each sampling region (Krausman 1999).The vulnerability of spiders to abiotic and biotic stimuli is directly connected to their macro-scale dispersion (Mineo et al., 2010). Furthermore, the vegetation structure of each environment has a significant impact on spider dispersal. The underlying process of the spider's microhabitat choosing is difficult to resolve due to the mix of many elements that influence it (Huber and Schutte, 2009). Plants or the ground are used as a substrate by most spider groups. A vast range of microhabitats for pholcid spiders has been observed, ranging from leaf litter to higher vegetation. Ground-dwelling pholcids can be found under leaf litter, webs between buttresses, small holes in trees, and fallen logs in forested regions. The dark provides a vital environment for ground dwelling creatures (Huber, 2000). Spiders hide in dark places to avoid being seen and to make it harder for their major predators to catch them (Huber, 2005).

Leaf-dwelling pholcids, on the other hand, are known to live on the undersides of massive leaves. Their pale greenish tint and delicate long legs distinguish them. Instead of whirling and dropping off the web, these pholcids frequently spend the day pushed against the undersides of leaves (Deeleman-

Reinhold, 1986). As a result, their anatomy and behavior help them to evade predation. Even though some studies have shown specific relationships between spiders and specific plant species, the association of spiders with specific plant types or species has been thought to be unusual (Romero, 2006; Vasconcellos-Neto et al., 2007). The spiders were found in domed webs close to the ground, hidden under rocks or logs.source: Revision, phylogeny, and microhabitat shifts in the Southeast Asian spider genus *Aetana* sp.

THE PROBLEM AND ITS SCOPE

Statement of the Problem

The main objective of the study was to determine the species diversity of Pholcid spider in Bohol Biodiversity Complex, Bilar, Bohol.

Specifically, the study aimed to answer the following questions:

1. What are the species of pholcid spiders in Philippine Bohol Biodiversity Complex?
2. What species of pholcid spider is dominant in every sampling area?
3. What is the species diversity and relative abundance of pholcid spider in Philippine Bohol Biodiversity Complex?
4. What are the factors influencing the species diversity?

Significance of the Study

The main goal of the study was to determine the pholcid spider diversity in Bohol Biodiversity Complex, Bilar, Bohol, Philippines. The result would serve as a reference for further study of pholcids in Barangay Roxas.

The result of the study would be a great help of the following beneficiaries;

The Department of Environmental and Natural Resources. As the leading agency of the government that concerns with the forest regeneration, rehabilitation, maintaining and managing the natural resources. This serve as the reference to determine the pholcid diversity in Bohol province particularly in barangay Roxas, it would serve as their basis of the prospective project.

The Academe. The result of this study would serve as their reference for research purposes of learning institutions.

The Students. The finding of the study would enable the students to be aware and enhance their knowledge about importance of spiders. It will serve as their reference for some studies related into it.

The Future Researchers. The data gathered in this study would motivate future researchers and organizational group who needs more information related to the study

RESEARCH METHODOLOGY

Research Design

Pholcids were collected using a combination of aerial-hand searching and ground-hand searching methods. Most spider groups use plant and ground as their microhabitats. In this study, ecology of pholcid spiders was investigated in selected sites in Roxas, Bilar, to determine the microhabitat utilization of leaf-dwelling and forest ground-dwelling pholcids in separated 10 plots.The easiest way to capture and collect spiders was to scare them into a dry container (such as the empty film canisters) and then transferred them into a container with alcohol. Alternately, the film canister could be placed in a freezer, for a few minutes. In the freezer the spider would enter torpor and die relatively quickly and may experience fewer traumas. The following were a few basic methods used when collecting spider species (Figure 1).

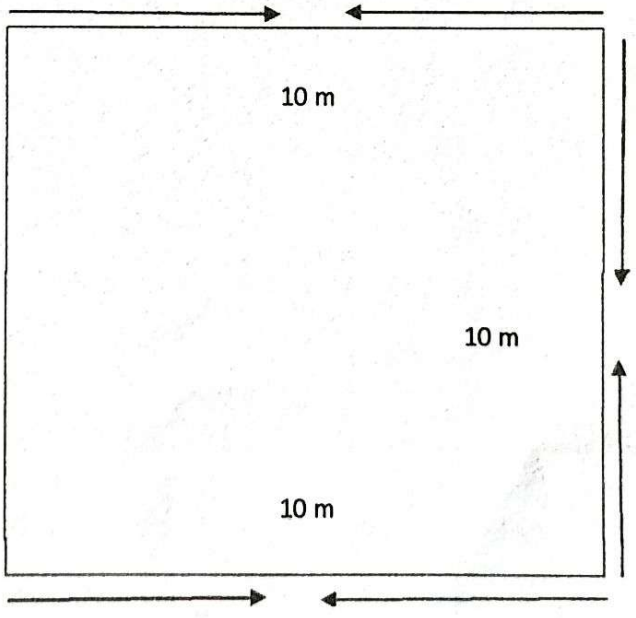

Figure 1. Layout of the sampling plots.

Collection of data

Visual Search

Walked through the habitat and search visually for spiders, their or retreats (curled leaves, silken cases). Walk through the habitat and checked for lose bark, fallen wood, debris, rocks.

Litter Sampling

Using gloves, and the researcher collected a large amount of leaf litter using a black plastic trash bag or similar container and searched for species.

Vial-Tapping Method

An improvise method for capturing samples using a plastic cup or wide-mouth vial with lid has been used during visual searching.(Figure 2.

Figure 2. Species collection using vial-tapping method.

Identification Process

The fist stem in identification was to separate specimens into morphospecies, or units that look different from one another. Each morphospecies was assigned a number so that specimens sorted later could be associated with similar previously encountered specimen. The most essential thing in identification is to collaborate with spider taxonomists for the proper identification of the specimens.

Research Environment

Bohol Biodiversity Complex is under the barangay of Roxas located in the municipality of Bilar in the province of Bohol. Its population was determined by the 2020 Census was 215.This represented 3.17% of the total population of Roxas. On the Philippine Island of Bohol, there is a protected landscape Bohol Biodiversity Complex (BBC) in Bilar town is a 25-hectare ecotourism site with almost two hectares of rainforest and secondary forest. Perfect for nature lovers, this project of the provincial government inculcates in the residents, especially the youth, the conscious caring for nature. The biodiversity complex was envisioned as a self-sustaining environment project of the Bohol Environmental Code of 1998, to help protect and conserve Bohol's different flora and fauna, particularly its skinny trees endemic birds, and other endangered species. It continues to raise awareness and conservation concerns among both locals and tourists. Surrounded by 1.2 hectares of rainforest, the complex serves as a great starting point to see various endemic tree seedlings.(Figure 3).

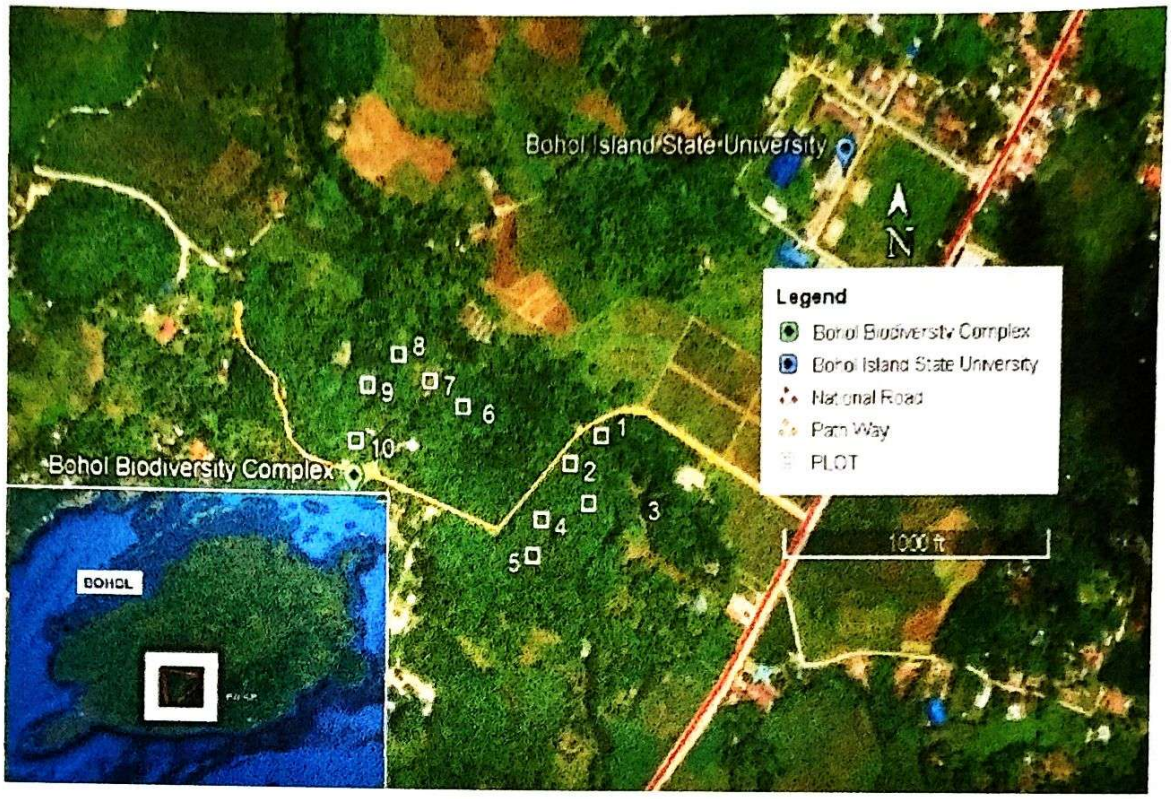

Figure 3. Location of the study site with the established sampling plots.

Research Instrument

The materials can used in collecting pholcid species samples were: tape measure, surgical gloves, ethanol by, USB Camera, containers, GPS , plastic cups, phone camera, meter tape, cotton, stick, sturdy nets, record book, markers, and magnifying glass.

Research Procedure

A. Coordination with the project in charge.

A permit letter was given to the staff in-charge for permission and notification regarding the purpose of the study.

B. Collection of Secondary Data

The project profile, shapefile of thematic maps, and other associated maps were acquired and used in the actual survey at the research site.

C. Collection of Primary Data

The actual collection of spiders using different method would follow accordingly in the site. Pholcids was collected using a combination of aerial-hand searching and ground-hand searching methods.

D. Sorting of Samples

Sorting of spiders would follow right after collecting it from the different traps.

Statistical Analysis

The Shannon diversity index (a.k.a. the Shannon–Wiener diversity index) is a popular metric used in ecology. It's based on Claude Shannon's formula for entropy and estimates species diversity. The index takes into account the number of species living in a habitat (richness) and their relative abundance (evenness). The proportion of species *i* relative to the total number of species (p_i) is calculated, and then multiplied by the natural logarithm of this proportion ($\ln p_i$).

The resulting product is summed across species, and multiplied by the Shannon diversity index (*H*) is another index that is commonly used to characterize species diversity in a community. Like Simpson's index, Shannon's index accounts for both abundance and evenness of the species present.

$$H' = -\sum_{i=1}^{R} p_i \ln p_i$$

Cluster Analysis (Ward 1963)

- Cluster: a collection of data objects similar to one another within the same cluster and dissimilar to the objects in other clusters.
- Cluster analysis is the grouping a set of data objects into clusters.

Dendogram – an analysis that would compare the selected sites based on the similarity of species.

Bray-Curtis Dissimilarity – used in ecology and biology to quantify how different two sites are in terms of the species found in those sites: Calculated as:

When = (2*Cij)/(si+Sj)

Cj:=The sum of the lesser values for the species found in each site.

Si:=The total number of specimens counted at site

The Canonical Correspondence Analysis (CCA) was used to determine the species and environmental factors association.The statistical analysis was conducted using PAST equation.

For diversity, PAST software shall be used to generate diversity indices, to examine if there is a significant difference in preferred microhabitats.

PAST Software

Past Software is free software for scientific data analysis with functions for data manipulation, plotting, univariate and multivariate statistics, ecological analysis, time series and spatial analysis, morphometric and stratigraphy.

Definition of Terms

Composition - In this study in pertains to the arrangement of spiders, or the act of putting something together, or the combination of elements or qualities.

Functional - It refers to the biology of individual spider species, including their taxonomy and distribution.

Biodiversity – It refers to the variety of life on Earth at all its levels, from genes to ecosystems, and can encompass the evolutionary, ecological, and cultural processes that sustain life.

Diversity – It refers to the range of human differences, including but not limited to race, ethnicity, gender, gender identity, sexual orientation, age, social class, physical ability or attributes, religious or ethical values system, national origin, and political belief

Abundance – It refers very large quantity of something.

Dendogram – In this study, it pertains to a diagram that shows the hierarchical relationship between objects. It is most commonly created as an output from hierarchical clustering.

Visual Search – In this study, it pertains to the walking through the habitat and searching for spiders and for their webs (curled leaves, silken cases).

Sweeping - In this study, it pertains to the using of heavy insect net (or even a pillowcase stretched over a wire clothes hanger) sweep through the top foot of loose soft vegetation or tall grass.

Beating - This method is much like sweeping. In this case spread the cloth sheet under a bush or the low branches of a tree.

Pitfall Trapping - One of the most effective methods of capturing ground-living spiders

Litter Sampling - In this study, it pertains to the using of gloves, collect a large amount of leaf litter in a black plastic trash bag or similar container.

Pholcid Spider – This refers to cellar spiders or daddy long-legs spiders which is very confusing as this name.

Forest – This refers to a thick growth of trees and bushes that covers a large area.

Ecosystem – This refers to everything that exists in a particular environment.

Biology – This refers to the plant and animals life of a particular place.

Connation – This refers to the development fusion of organs of the same type.

CHAPTER 2

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the presentation and findings of data. To achieve the purpose of this study, the researcher made full use of the numbers of collected Pholcid Spider at every plot as well as the number of every order up to their family level were identified.

Data on the diversity and distribution of pholcid spiders in every site are here under presented and analyzed.

Species Account

Two species belonging to the Family Pholcideae were identified: *Aetana* sp. and *Crossopriza lyoni.* The Aetana is a genus of spiders belonging to the family Pholcidae, which are colloquially referred to as daddy long-legs spiders. Size 2.4 cm (0.39 in). These spiders are an ocherous yellow, with light brown legs covered in dark bands. The *Aetana sp.* Found in plot 2, and 5 (Figure 4) was caught under a pile of wood and dying leaf of mango *(Mangifera indica*) in plot 10 Aetana was capture inside the hole of bamboo (Bambusoideae) from shady area. Like other members of the Pholcidae family, they have very long legs. The eggs are laid inside a silk sac, with each sac containing around 30 eggs. Spiderlings have comparatively short legs than adults, but eventually, they resemble adults as they mature. The webs are irregularly built, with them adding layers on top of existing ones.

Figure 4. Scientific Name: *Aetana* sp. Barangay: Roxas Biliar, Bohol.

During the survey Crossopiza lyoni were mostly found in plots 6 and 7 are mostly caught under the buttress of mahogany (Swietenia macrophylla) (Figure 5) The fair of legs in larger 2.4 cm in length. The legs are gray to amber in color covered with numerous small longitudinal brown spots.the knee joins are brown with dark yellow. They *Crossopiza lyoni* spider are commonly known as a cellar spider, that prefer to live in or around human structures. They are commonly known as a tailed cellar spider,tailed daddy long legs spiders, and sometimes box spider. Their abdomens are distinctly squarish when viewed from the side and their carapace is more or less circular when viewed from above.They

abdomen is gray with white lateral stripes and various dark and light patches on the other side and the upper surface. They have conical hump on the upper back and they have six eyes.

Figure 5. Scientific Name: Crossopiza lyoni Barangay: Roxas Biliar, Bohol.

Community Structure

The Dendogram shows that the10 sampling plots cluster analysis generated through PAST software using the Bray-Curtis Similarity Index.In the analysis of similarity of species according to their habitat type and number of individuals, they have a two major groups were identified. Cluster 1 have two plots grouped together, in which area has a dominant species *Aetana* sp On other hand cluster 2 has eight plots grouped together has dominant species *Crossopriza lyoni*. In this cluster they have a two plots that similar species can collect on plot 3 and 4.The cophenetic correlation is 0.89. as the value is quite close to 100% the clustering is quite fit (Figure 6).

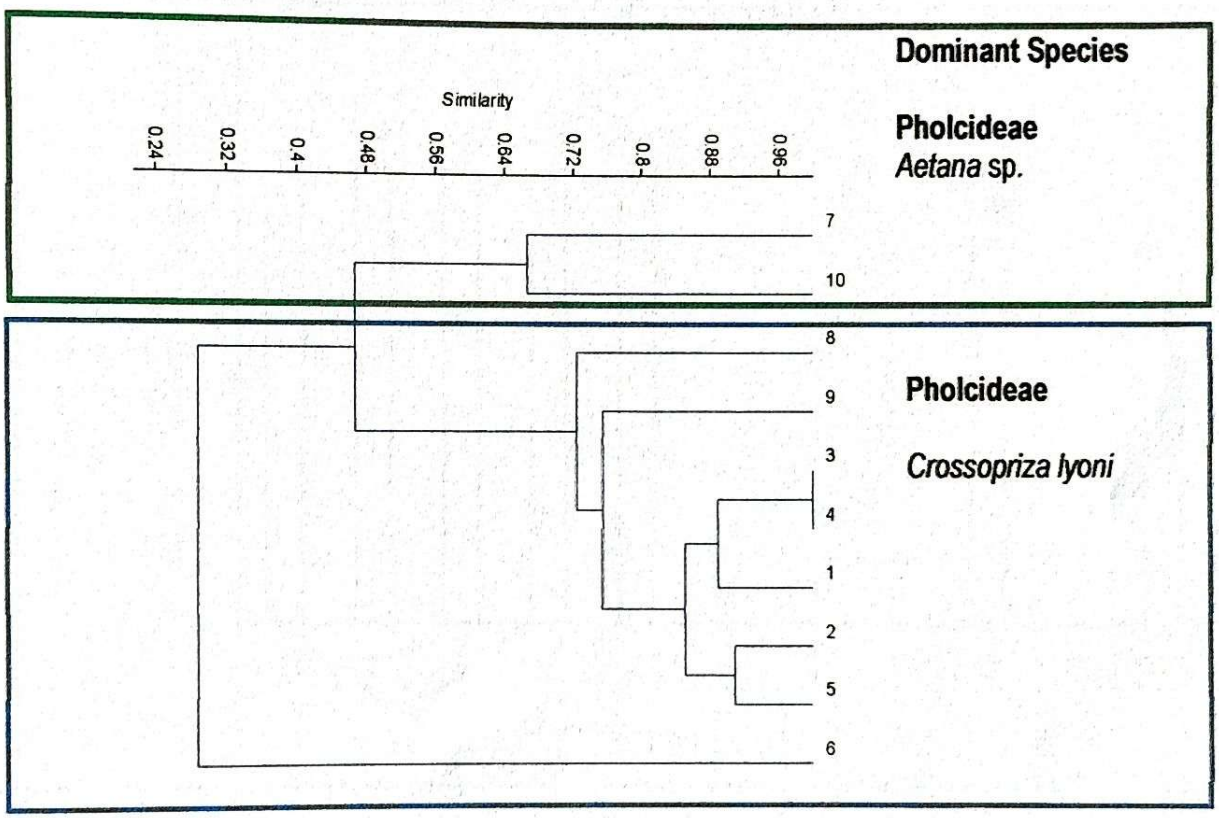

Figure 6. Dendogram with 10 sampling plots generated through PAST software using the Bray-Curtis Similarity Index. Cophenetic correlation value reached 0.79.

Species Diversity of Pholcid Spider

Plot number 1 (0.6931) had the highest species diversity compared to the others plots; because the sampling areas were forested and shady, unpopulated and less human intervention. Followed by plot 2, 3, 4, and 5 (0.673). However, plot number 9 (0.5623) had a low diversity because it is sometimes disturbed by human intervention. Plot 6, 7, 8, and plot 10 had zero diversity due to the natural disturbance specially the typhoon *Odette* that struck the Island of Bohol last December 17, 2021 before the conduct of the sampling causing the area to be flooded. The combined H' index for all plots was 0.39474 which indicated that the sampling area is diverse in pholcid species (Figure 7).

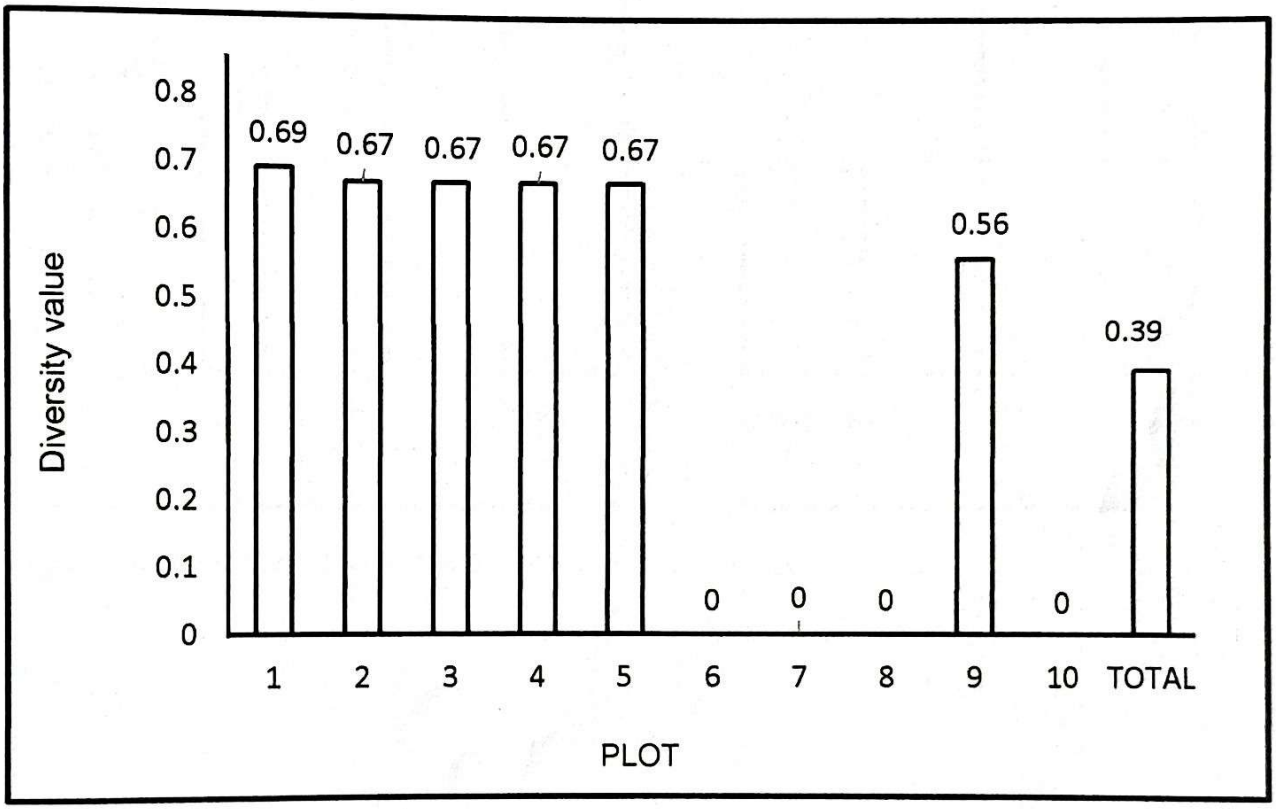

Figure 7. Species Diversity in different sampling plots

Figure 8 show the diversity index in every habitat. Rainfo habitat got a diversity value of 0.693. Followed by pfen having a value of 0.683 and the dipteropark with 0.277. When summed the total diversity value is 0.551 which determine that the result was not diverse.

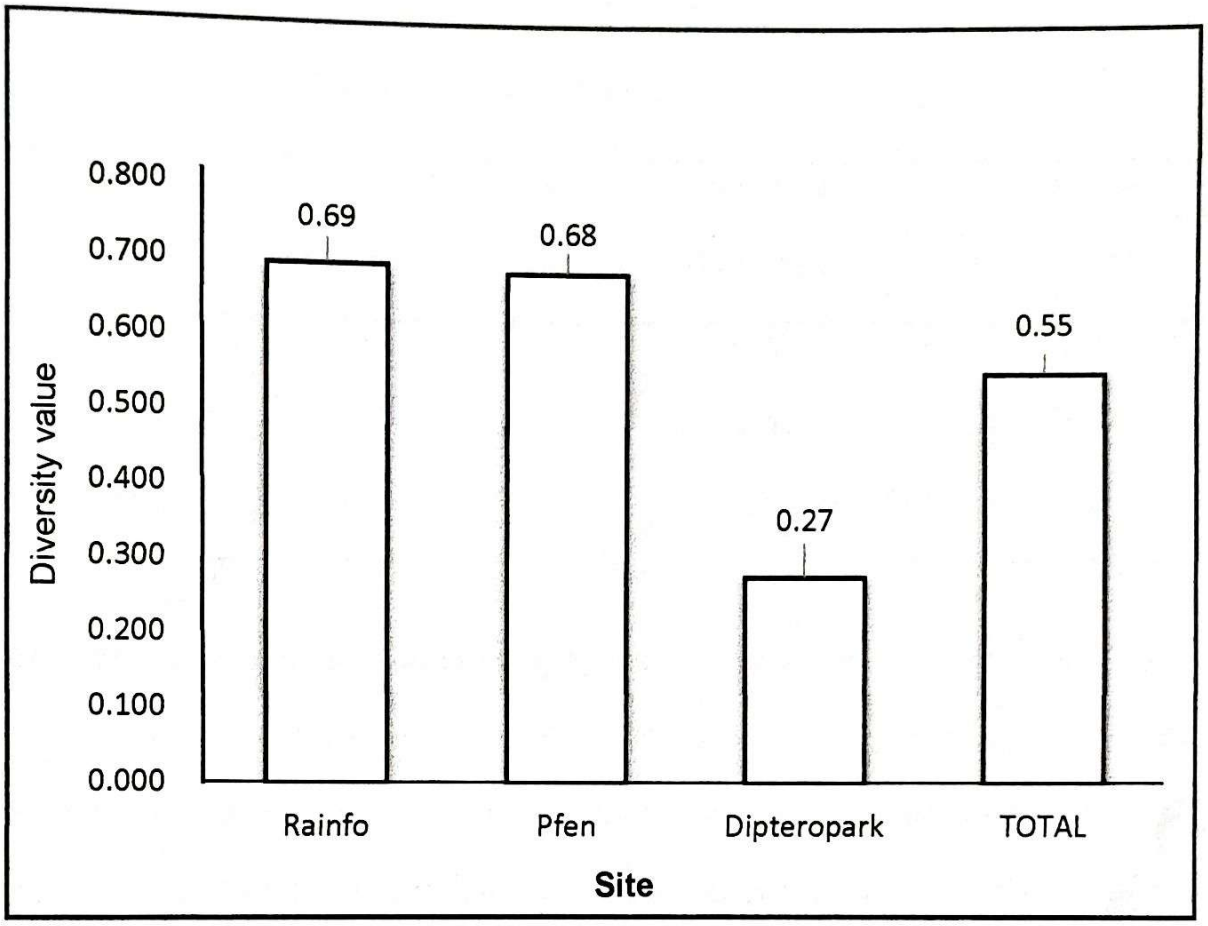

Figure 8. Diversity index in every habitat

Relative abundance of pholcid spider in bohol Biodiversity Complex

Table 1 shows the relative abundance of Pholcid spiders recorded in the sampling plots. *Aetana* sp. Related to be abundant in the area with a total of 19 number of individuals 57% followed by *Crossopriza lyoni* with 18 number of individuals 43%.

Table 1 Relative abundance of species

Genus	No. of samples	Relative abundance	Relative abundance(%)
Aetana sp.	19	0.56	56.75
Crossopiza lyoni	18	0.43	43.24
TOTAL	37	1	100

Environmental Factors Influencing Spider Occurrence

The Canonical Correspondent Analysis (CCA) shows what the Pholcid Spider *Aetana* sp. species were dependent into soil temperature,and air temperature. While *Crossopiza lyoni* was dependent to ground cover and vegetation cover.

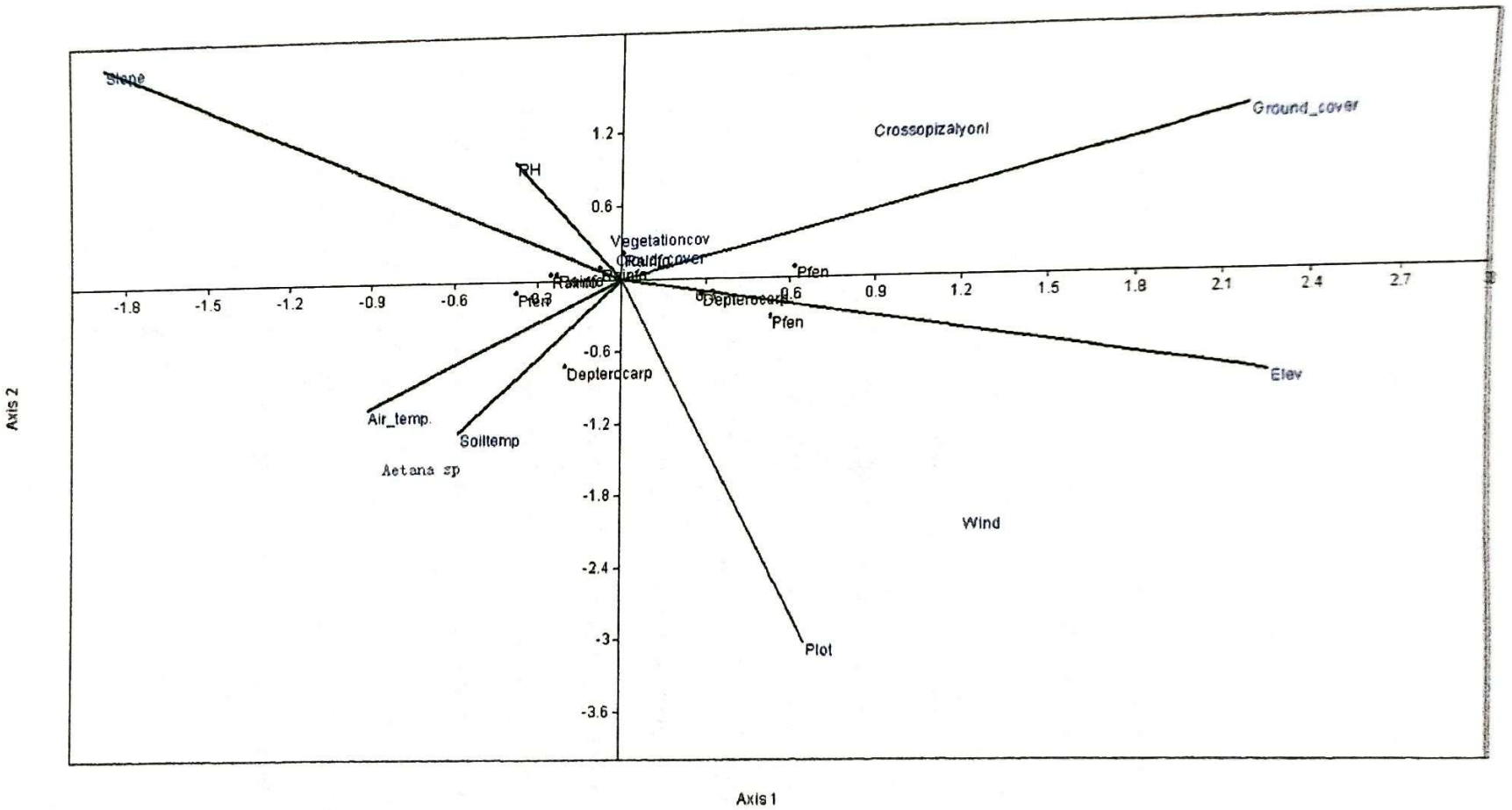

Figure 9. Canonical correspondence analysis (CCA) of pholcid spider and its habitat characteristics association. Code : RH = Relative Humidity, Elev - Elevation, Air_temp - Air Temperature, Soiltemp - Soil Temperature, Vegetationcov - Vegetation cover.

Chapter 3

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATION

Summary of Findings

This study was conducted at Bohol Biodiversity Complex, Philippines specifically in Barangay, Roxas Bilar Boho. The aim of this study is to identify the diversity of the family Pholcideae of spider species together with its microhabitats in Bohol Biodiversity Complex.Two different spider species under the family pholcideae were observed during the collection of data and these are namely *Crossopriza lyoni* and *Aetana* sp. *Aetana* sp. These spiders are commonly called the cellar spider also known as daddy long-leg spider or gyrating spider, and the *Crossopriza lyoni* is referred to as the skull spider also known as cellar spider. Both of the spider species are web building spider are bio-indicator for air pollution. In the analysis of similarity of species according to their habitat type and number of individuals, two major groups were identified. Cluster 1 have two plots grouped together, in which area has a dominant species *Aetana sp* . On other hand cluster 2 has eight plots grouped together has dominant species *Crossopriza lyoni.* In this cluster they have a two plots that similar species can collect on plot 3 and 4.

Conclusion

Based on the data gathered, the following conclusions are drawn two spider species were identified under the family Pholcideae and all of these were venomous but isn't particularly strong and isn't harmful to humans. These include the common daddy lon-legs spider (*Aetana* sp.) and carpenter spider (Crossopriza lyoni). Pholcid spiders recorded in the sampling plots. The *Aetana* sp. species is more abundant in the area with a total of 19 number of individuals (56.75%) followed by *Crossopriza lyoni* with 18 number of individuals (43.24%).This study concluded that the forest edge area of Bohol Biodiversity Complex (BBC) was less diverse by these following reasons. First the time frame of the study was short, its affect the result and discovery of individual per plot. Second will be the seasonal variations if the temperature and humidity in this area is not suited for this species you will expect that less earthworm will be caught. The index values of species diversity of pholcid in the sampling areas. Based on the data, Plot number 1 (0.6931) had the highest species diversity compared to other plots because the sampling areas were forested, shady, unpopulated and less human intervention followed by plot 2, 3, 4, and 5,(0.673) and plot 9(0.5623) is the lowest . However, plot number 6, 7, 8, and 10 (0.0) had a very low diversity because it is from time to time disturbed by human interventions

Recommendations

On the basis of the findings, the following recommendations are forwarded:

1. Conduct the same study on different sites and during a different period of time in order to differentiate seasonal variations and how it affects the collection of individuals in each family.
2. Increase sampling effort inorder to make better and good representation of the study site.
3. Use of different methods in conducting study in order to validate which method will capture more Pholcid.
4. Create field guide on Pholcideae family if ample amounts of species are collected as basis in identifying.
5. Submit the unknown species on the expert for the identifications.

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APPENDIX

DAY 1 **Plot 1.**

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Daddy long-leg	*Aetana sp.*	Rock build-up		Visual search	Shady Area
Daddy long-leg	*Aetana sp.*	Buttress	*Swietenia macrophylla*	letter sampling	Shady Area
Cellar	*Crossopiza lyoni*	Beneath of wood pile	*Swietenia macrophylla*	letter sampling	Shady Area
Cellar	*Crossopiza lyoni*	Beneath of wood pile	*Swietenia macrophylla*	letter sampling	Shady Area

Plot 2.

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Daddy long-leg	*Aetana sp.*	Under side of leaf	*Myristica simiarum*	letter sampling	Shady Area
Daddy long-leg	*Aetana sp.*	Buttress	*Dracontomelon dao*	letter sampling	Shady Area
Cellar	*Crossopiza lyoni*	Buttress	*Swietenia macrophylla*	letter sampling	Shady Area
Cellar	*Crossopiza lyoni*	Buttress	*Swietenia macrophylla*	letter sampling	Shady Area

Day 2

Plot 3.

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Cellar	*Crossopiza lyoni*	Buttress	*Mangifera indica*	letter sampling	Fully shady
Cellar	*Crossopiza lyoni*	Buttress	*Mangifera indica*	letter sampling	Fully shady
Cellar	*Crossopiza lyoni*	Under the side of leaf	*Mangifera indica*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Under the side of leaf	*Mangifera indica*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Under the side of leaf	*Mangifera indica*	Letter sampling	Fully shady

Plot 4.

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Cellar	*Crossopiza lyoni*	Under the side of leaf	*Shorea contorta*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Buttress	*Shorea contorta*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Buttress	*Shorea contorta*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Beneath of wood pile	*Mangifera indica*	letter sampling	Fully shady
Cellar	*Crossopiza lyoni*	Rock build-up		Visual search	Fully shady

Day 3

Plot 5.

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Cellar	*Crossopiza lyoni*	Beneath of wood pile	*Swietenia macrophylla*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Beneath of wood pile	*Swietenia macrophylla*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Beneath of wood pile	*Swietenia macrophylla*	letter sampling	Fully shady
Daddy long-leg	*Aetana sp.*	Beneath of wood pile	*Swietenia macrophylla*	letter sampling	Fully shady
Cellar	*Crossopiza lyoni*	Under the side of leaf leaf	*Alpinia elegans*	letter sampling	Fully shady

Plot 6

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Cellar	*Crossopiza lyoni*	Buttress	*Swietenia macrophylla*	letter sampling	Shady Area
Cellar	*Crossopiza lyoni*	Buttress	*Swietenia macrophylla*	letter sampling	Shady Area
Cellar	*Crossopiza lyoni*	Buttress	*Swietenia macrophylla*	letter sampling	Shady Area

Day 4

Plot 7.

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Daddy long-leg	*Aetana sp.*	Buttress	*Swietenia macrophylla*	letter sampling	Partly shady

Plot 8.

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Daddy long-leg	*Aetana sp.*	Buttress	*Ficus benjamina*	letter sampling	Shady Area
Daddy long-leg	*Aetana sp.*	Buttress	*Ficus benjamina*	letter sampling	Shady Area
Daddy long-leg	*Aetana sp.*	Buttress	*Ficus benjamina*	letter sampling	Shady Area
Cellar	*Crossopiza lyoni*	Selling		Visual search	Shady Area

Day 5

Plot 9.

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Vagetation cover
Daddy long-leg	*Aetana sp.*	Selling		Visual search	Shady Area
Cellar	*Crossopiza lyoni*	Selling		Visual search	Shady Area
Cellar	*Crossopiza lyoni*	Selling		Visual search	Shady Area

Plot 10

Common Name of species	Species	Microhabitat	Scientific Name of Laef/Tree	Method of captivity	Weather condation
Daddy long-leg	*Aetana sp.*	Bamboo	*Bambusoideae*	letter sampling	Partly shady
Daddy long-leg	*Aetana sp.*	Bamboo	*Bambusoideae*	letter sampling	Partly shady

APPENDIX-A

Scientific name	Common name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Total
Aetana sp.	Daddy long-leg	2	3	2	2	3	0	0	3	1	2	18
Crossopiza lyoni	Cellar	2	2	3	3	2	3	1	1	2	0	19

APPENDIX - B

Species name	No. Of species	PI	LNPi	Pi*LNPi
Aetana sp.	19	0.567567568	-0.57	-0.32
Crossopiza lyoni	18	0.432432432	-0.84	-0.36
	37			-0.683988433

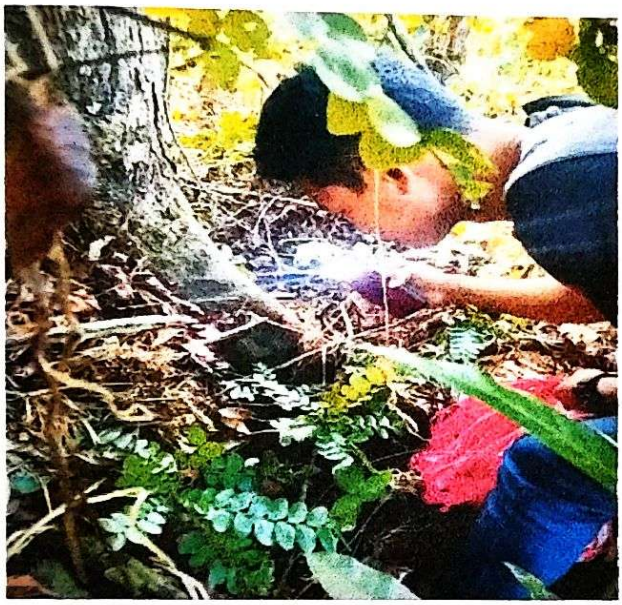
APPENDEX - C

	0 Rainfo	Pfen	Dipteropark
Taxa_S	2	2	2
Individuals	24	7	6
Dominance_D	0.5	0.5102	0.5
Simpson_1-D	0.5	0.4898	0.5
Shannon_H	0.6931	0.6829	0.2773
Evenness_e^H/S	1	0.9898	1
Brillouin	0.6171	0.5079	0.4993
Menhinick	0.4082	0.7559	0.8165
Margalef	0.3147	0.5139	0.5581
Equitability_J	1	0.9852	1
Fisher_alpha	0.5187	0.9354	1.051
Berger-Parker	0.5	0.5714	0.5

APPENDEX-D

Habitat	Plot	Elev	Slope	Airtemp	Soiltemp	RH	Ground Cover	Wind	Cloud cover	Vegetation cover	*Aetanasp.*	*Crosslyoni.*	
Rainfo	1	288	1	25	28	85	2	1	3	2	2	2	
Rainfo	2	287	1	26	27	93	2	1	3	2	3	2	
Rainfo	3	288	1	26	28	85	3	1	3	3	2	3	
Rainfo	4	288	1	23	28	85	3	1	3	3	2	3	
Rainfo	5	288	2	23	27	93	1	1	1	3	3	2	
Pfen	6	287	2	25	26	93	3	2	1	2	0	3	
Pfen	7	293	1	24	29	27	2	2	2	1	0	1	
Pfen	8	287	2	27	28	29	1	1	2	2	3	1	
Depterocarp	9	293	1	26	27	85	2	2	1	2	1	2	
Depterocarp	10	287	1	26	28	92	2	2	1	1	2	0	
											18	19	37

APPENDIX - E



APPENDIX - F

APPROVAL SHEET

The thesis entitled "PHOLCID SPIDER DIVERSITY AND MICROHABITATS IN BOHOL BIODIVERSITY COMPLEX (BBC) BOHOL, PHILIPPINES" prepared and submitted by Jemie T. Dismas in partial fulfillment of the requirements for the degree Bachelor of Science in Forestry (BSF) has been examined and recommended for acceptance and approval for oral defense.

RESEARCH COMMITTEE

REIZL P. JOSE, PhD
Adviser

NOEL T. LOMOSBOG, PhD
Dean

MARY BETH SARNOWSKI, MRes
Editor

EDDIE P. MONDEJAR, PhD
Statistician

LYNDE QUIÑONES - BULLONG, PhD
Internal Expert

WILBERT A. AUREO, MSc.
Chairperson

EXAMINING PANEL: Approved by the committee on Oral Examination with the rating of _____.

MARIETTA C. MACALOLOT, PhD
Campus Director

WILBERT T. AUREO, MSc
Member

NOEL T. LOMOSBOG, PhD
Member

REIZL P. JOSE, PhD
Member

LYNDE QUIÑONES - BULLONG, PhD
Member

Accepted and approved in partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN FORESTRY.

Date and approved Defense: May, 2021

NOEL T. LOMOSBOG, PhD
Dean, College of Agriculture and Natural Resources

APPENDIX - G

PARENTAL CONSENT

Permission is granted for my/our son/daughter to participate in the following Field Trip/ Educational Tour/Field Practice/Field activity:

NAME OF STUDENT	:	Jemie T. Dismas
COURSE	:	Bachelor of Science in Forestry
SCHOOL	:	Bohol Island State University, Bilar Campus
THESIS TITLE	:	PHOLCID SPIDER DIVERSITY AND MICROHABITATS IN BOHOL BIODIVERSITY COMPLEX (BBC) BOHOL, PHILIPPINES
DESTINATION	:	Bohol Biodiversity Complex (BBC) Roxas, Bilar, Bohol
DATE	:	November 9, 2021

I/We hereby acknowledge that sufficient information has been provided by the school with respect to the planned activity, duration, location, method of transportation, participants and supervision.

I/We hereby acknowledge that certain RISKS or INJURIES are inherent to participate in learning activities outside the school. These types of injuries may be minor or serious and may result from one's actions, or the actions or actions or inaction of others, or a combination of both.

I/We understand that the rules and regulations established for the Field Trip/Educational Tour are designed for the safety and protection of the participants and hereby undertake to inform my child to abide these rules and regulations.

I/We declare having read and understood the above Parental Consent Agreement in its entirety and hereby consent to allow my/our child to participate, acknowledging all of the foregoing.

IN WITNESS WHEREOF, I/We hereto affix my/our signature this 17 th day of November, 20 21 at Poblacion, Bilar, Bohol, Philippines.

Gerardo T. Dismas

Parent/Guardian

(signature over printed name)

Valid ID No. VIN: 1239-0024B-C0366GTD10000

Marciana D. DISMAS

Parent/Guardian

(signature over printed name)

Valid ID No. VIN: 1239-0024A-G117GMTD20000

SUBSCRIBED AND SWORN to before me this 17 th day of November, 20 21 at Poblacion, Bilar, Bohol, Philippines

ATTY. LORETO B. DORIA, CPA
Notary Public
DORIA LAW OFFICE, POBLACION, BILAR, BOHOL
Email: loreto.doria@yahoo.com
Mobile Nos. 09183713939/09674232276
NCS No. 2019-01, Extended until December 31, 2021
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MCLE Compliance No.VI-0006657 until April 14, 2022
PTR No. 9858549 01-07-2021, TIN 263-242-449

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APPENDIX - I

Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY
College of Agriculture and Natural Resources
Forestry and Environmental Science Department
Bilar Campus,Zamora, Bilar, Bohol

November 24, 2021

HON. TERESITA C. BAYRON
Barangay Captain
Roxas
Bilar, Bohol

Dear Ma'am,

I am Mr. Jemie T.Dismas, a fourth-year college student at Bohol Island State University, Bilar Campus, taking up Bachelor of Science in Forestry.

One of the requirements for graduation is conducting research (thesis). My study is entitled **"PHOLCID SPIDER DIVERSITY AND MICROHABITATS IN ENTIRE AREA OF BOHOL BIODIVERSITY COMPLEX (BBC)".** I am asking permission to conduct a study starting November, 2021 to January, 2022, every week days, 8 am to 5 pm in Bilar, Bohol.

The permission you will grant is a great help to my study with the assurance of complying whatever your office will require me.

Thank you and God bless!

Very truly yours

JEMIE T. DISMAS
Student Researcher

Noted by:

REIZL P. JOSE, PhD
Thesis Adviser

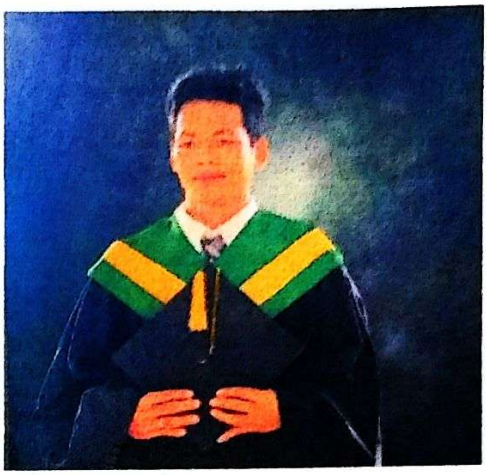
Recommending Approval:

NOEL T. LOMOSBOG, PhD
Dean, CANR

HON. TERESITA C. BAYRON
Brgy Captain

RESEARCHER'S PROFILE

PERSONAL PROFILE



Name	: Jemie T. Dismas
Nick Name	: jem
Citizenship	: Filipino
Civil Status	: Married
Date of Birth	: March, 12, 1998
Place of Birth	: Lico lico, Sevillia, Bohol
Residence	: Lico lico, Sevillia, Bohol

EDUCATIONAL ATTAINMENT

Elementary	: Lico lico, Elementary, School
Secondary	: Poblacion Naional High School
	: Cambague Calinginan Norte National High,School
Collegiate	: Bohol Island State University – Bilar Campus
	: Zamora, Bilar, Bohol
Degree Earned	: Bachelor of Science in Forestry 2021-2022

MEMBERSHIP ORGANIZATIONS

- Forestry and Environmental Science Students Society (FESSS) 2018-2022