International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume: 3 | Issue: 3 | Mar-Apr 2019 Available Online: www.ijtsrd.com e-ISSN: 2456 - 6470

The Macrofungi in the Island of San Antonio, Northern Samar, Philippines

Rockett Rikki T. Jusayan[1], Manuela Cecille G. Vicencio[1,2]

[1]Department of Biological Science, College of Science, Philippines
[2]University Research Office, University of Eastern Philippines,
[2]University of Eastern Philippines, Catarman, Northern Samar, Philippines

How to cite this paper: Rockett Rikki T. Jusayan | Manuela Cecille G. Vicencio "The Macrofungi in the Island of San Antonio, Northern Samar, Philippines" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-3 | Issue-3 , April 2019, pp.968-975, URL: https://www.ijtsrd.com/papers/ijtsrd23228.pdf

IJTSRD23228

ABSTRACT

This study aimed primarily to identify the different macro fungi species in the Island of San Antonio, Northern Samar. Specifically, its objectives were: to identify the different species of macro fungi in the study are; to classify hierarchically the macro fungi species; to determine the kind of substrate where macro fungi grow; and to know the economic uses of macro fungi in the study area. It was conducted in the Island of San Antonio Northern Samar, which is composed of ten (10) barangays namely: Vinisitahan, Dalupirit, San Nicolas, Rizal, Manraya, Pilar, Burabod, Ward III, Ward II, and Ward I during the months of October and November 2012.

A total of twenty-six (26) macro fungi species were present in ten (10) sampling sites. These macro fungi species were, namely: Amanita sp. , Ampulloclitocybe clavipes, Auricularia polytricha, Bjerkandera adusta, Coprinus lagopus, Cortinarius corrugants, Fomes fomentarius, Ganoderma adspersum, G. lucidum, Helvella lacunose, Infundibulicybe gibba, Inocybe rimosa, Laccaria laccata, Lycocerdon mammiforme, Marismius scoradoniusqa, Phallus indusiatus, P. multicolour, Pycnoporus cinnabarinus, Pleurocybella porrigens, Podoscypha petalodes, Polyporus arcularius, Spongipellis pachydon, Tremella fuciformis, Tramatese legans, T. hirsute and T. trogii. The macro fungi species in the study area were mostly found on dead wood, soil, tree branches, coconut husk and decaying banana trunks. In terms of economic issues, the twenty-six (26) macro fungi species were familiar to the residents, but they have unknown uses or benefits to them.

KEYWORDS: *macrofungi, Northern Samar*

INTRODUCTION

Fungi were long classified as members of the plant kingdom because they appeared to be similar to plants. However, fungi differ from plants in several distinct ways. Compare what you have learned about cell wall composition in fungi and plants. The cell walls of plants are composed of cellulose, whereas the cell wall of almost all fungi contain chitin; in addition, plants are autotrophs, whereas fungi are heterotrophs. They cannot make their own food, and because fungi, and because of these and other differences, fungi are now classified in their own kingdom. However, because fungi were once classified plants, the main groups of the kingdom fungi are *divisions* rather than *phyla* (Strauss and Lisowski, 2003)

All fungi are chemo heterotrophs, requiring organic compounds for energy and carbon. Fungi are aerobic or facultatively anaerobic; no strictly anaerobic fungi are known. The majority of fungi are saprophytes in soil and water; there they are primarily decomposers of materials. Like bacteria, fungi contribute significantly to the decomposition of matter and the recycling of nutrients. Reproduction in fungi occurs by spore formation. These spores, however, are quite different from bacterial endospores (Tortora, Funke, and Case, 1992). Fungi touch our lives in many ways; they, together with the bacteria, are the decomposers of the world, breaking down vast quantities of dead organic matter that would otherwise accumulate and make the earth uninhabitable. Through their activities, the minerals contained within the dead bodies of plants and animals are made available for recycling through the ecosystem. Their role as decomposers has its dark side, however, because they also cause spoilage of bread, fruits, vegetables, and other foodstuffs, and the deterioration of other goods, fabrics, paper, lumber, and other valuable products. Some fungi are parasitic on or in animals, including humans; many skin diseases, including ringworm and athlete's foot, are caused by fungi and there several serious diseases of the lungs caused by fungi (Mcfadden and Keeton, 1998)

Six (6) species were identified under the family *Tricholomataceae,* namely, *gymnopus aceruatus* found in barangay talolora, *Marasmus oreades* found in Barangay Sangay, *Marasmus plicatus* found in barangay Sangay, *Pluteus*

Cervinus found in Barangay Capacujan, *Strobilurus trullisatu*s found in barangay talolora and *Volvariella spp* found in Barangay Sangay.

Musngi, et al,. (2005) reported that most taxonomic work in macro fungi in the Philippines has focused on the general descriptions of *Basiodiomycota*. They also stated that several local researchers in the Philippines have tried to document the different macro fungi that inhabit the mountainous areas of the country. They described four species of *Auricularia* species were noted as follows: rain tree (*samenea Saman L.*), Coconut (*cocos Nucifera L.*), ipil-ipil *(Leucaena Leucocephala L.),* mahogany (*Sweitenia Mahogany L.),* Mango (*Manggifera indica L.),* and rubber tree *(Hevea Brasiliensis L.)*. Among these host trees, rain trees supported the highest number of *Auricularia* species identified.

Macrofungi are those fungi that form large fructifications visible without the aid of a microscope. This artificial but convenient grouping is hereby defined to include fungal families or genera where the majority of included species produce fruit bodies greater than 1 centimeter in diameter. Unlike micro fungi, which are made conspicuous by the diseases, decay, and moulding they cause, macro fungi are the ones most likely to either to be pollution indicators or threaten beneficial species (Readhead, 1997)

METHODOLOGY

This study was conducted in the island of San Antonio, Northern Samar. The Municipality of San Antonio is one of the 24 municipalities of the province of Northern Samar. The island is geographically located in the western section of the province of Northern Samar. Going to San Antonio takes about an hour and a half travel from Catarman via the Municipality of Victoria by taking the bus going to the cities of Tacloban or Calbayog. From the municipality of Victoria one takes the motorboat to cross the channel to Dalupiri Island, where the municipality of San Antonio is situated. The mainland of Samar is located in the east, in the west is the municipality of Capul, while on the northern part is San Bernardino Strait and on its southern part, the Samar Sea located. San Antonio is composed of 10 barangays, 3 of which are within the town proper. The island is one of the tourist destinations in Northern Samar, because of its beautiful view, fresh air, white sand beaches, and crystal clear water. The shape of this island is elongated; the topography of San Antonio is alluvium-hill of low relief, level to gently sloping. All barangays of San Antonio are situated along the coast. *Cebuano* is the language spoken by 66% of the residents, while *Nenorte Samarnon* language is spoken by 34% of the population. The total land area of San Antonio is 2,828,10 hectares (Municipal Planning and Development Council [MPDC], 2012)

Barangay Vinistahan is a sampling site located at the northern end of the island of San Antonio facing the municipality of Allen. Rice fields and grasslands where different animals are found like goats, carabaos, and cows are prominent land features.

Lagbangan Lake, a man man-made lake, is host to different classes of birds. It can be reached through motorcycle or motorboat. The main income of the residents here is copra production and fishing. The total area is 225.87 hectares (MPDC, 2012).

Barangay Dalupirit is a sampling site located at the western part of the island facing the municipality of Capul. It is a rocky, mountainous area with grasslands used to pasture animals such as cows and carabaos. Coconut plantaion is one of the main sources of income through the production of copra. Another source of income is fishing that contribute much to their livelihood. The barangay can be reached through motorcycle or biking from the town paper. It is considered as the second largest barangay because its total land area is 441.49 hectares (MPDC, 2012).

Barangay San Nicholas is a sampling sites next to barangay Dalupirit, which is more or less 1 kilometer away, and is bounded by the cemetery of Barangay Dalupirit. This place is also a rocky and woody, mountainous area with different species of trees present which are the habitat of birds and other living organisms. Fishing and copra production are the main sources of income of the residents. Its total land area is 190.96 hectares (MPDC, 2012).

Barangay Rizal is a sampling site next to Barangay Nicolas, located also at the western part of the island of San Antonio facingthe municipality of Capul. This barangay is not totally big. An underground cave that contains fresh water is found in an area which is an elevated portion of this barangay. This serves as the sources of water for the residents and is also the source of water for the other barangays through the "Photovoltaic (solar) Pumping System", a project of the Philippine – Australian Community Assistance Program (PACAP) and the Northern Samar Multi-Purpose Cooperative (NSDWCC).

Barangay Manraya is a sampling site located at the northwest part of the island next to Barangay Rizal, facing the Municipality of San Vicente, and is located beside the rocky mountainous area. It can be reached through motorcycle within 15 minutes from the town proper. Fishing and copra production are the main income of the residents and its total land area is 365.16 hectares (MPDC, 2012).

Barangay Pillar is a sampling site located at the southern end part of the island. Rice fields and lots planted to different kinds of vegetables and fruits are situated here because of the good quality of its soil. The government resource conservation project in the municipality, the fish sanctuary, is located here. Fishing, rice plating, and copra production are the main livelihood of the residents, and its total land area is 263.90 hectares (MPDC, 2012).

Barangay Burabod is the sampling site located at the southeast part of the island facing the Municipality of San Isidro, which is mountainous part of the island. Big houses and other establishments are situated here because some residents are businessmen. Fishing and copra production are also the main livelihood of the residents and its total land area is 175.44 hectares (MPDC, 2012).

Ward I, Ward II, and Ward III are the 3 sampling sites located in the town proper, facing to the Municipality of Victoria on the mainland of Samar.

Ward I is located at the north part of the town proper near to Barangay Vinisitahan. The Catholic Church, market, and a unfinished airport are situated here. Fishing and motorboat building are the main sources of income of the residents. The total land area of Ward I is 299.53 hectares (MPDC, 2012).

Ward II is the center for business in the town proper because of different business establishments and big houses. The total land area of Ward II is 72.75 hectares (MPDC, 2012)

Ward III is located at the south side of the town proper with a road going to Barangay Burabod. Many beach resorts are situated here. The District Hospital is located here and on the other side of the mountain, farms planted to different kinds of vegetables and fruits are located. Fishing and copra production are the main sources of income of the people here, with a total land area of 465.88 hectares (MPDC, 2012).

During the collection, sample specimens were removed from the substrate using a knife, but before picking the specimen, a digital camera was used to photograph each specimen directly from where it is located. Specimens were handled carefully to avoid damage and destruction of useful identification characteristics. The collected macro fungi species was placed in closed containers so that important features were not lost and they would not dry out. An interview with some of the local residents of the study area was conducted in order to gather information on the economic uses of these macro fungi present in the locality.

Preservation of the specimen

The representative samples of macro fungi were preserved either by drying or by immersing them in a 10% formalin solution and 70% denatured alcohol. Drying under the sun was done immediately for woody macro fungi specimens. For the fleshly fungi which possess the ability of regaining freshness when soaked in water, they were air dried at room temperature; these were not dried directly under the sun because rapid drying disfigures them. Normally, it takes 4 days or, often the time is extended, two weeks of drying under ordinary room temperature.

The method of preserving fragile and soft specimen is by immersing them in 10% formalin solution to make them rigid and firm. After one or two days, they were removed and washed with water and then transferred into jars containing 70% denatured alcohol where they can be kept and preserved indefinitely.

Identification of the specimens

The preserved specimen was sorted for ease of classification and identification. For preferences, some web pages about macro fungi in the internet, books, and other unpublished work were used in the preliminary identification of the collected samples. Verification of preliminary identification was done by an expert on macro fungi species. Available books and references about macro fungi were used to aid the final identification of the specimen that were collected. The books that were used are, to name a few: Guide to the Grassland Plants (Quimio,1983); illustrated Philippine Fungi (UP Los Banos, 1988), Eyewitness Handbook on Mushrooms (lassoe, 1998), Common Mushroom of the Northwest (Sept, 2006) and Edible Mushrooms (Wikipedia, 2005). The specimens were classified and authenticated by an expert of the College of Science, University of Eastern Philippines, University Town, Northern Samar.

RESULTS AND DISCUSSION

Distribution of Macrofungi in the Island of San Antonio, Northern Samar

They were twenty six (26) macro fungi species which were present and distributed in ten (10) sampling sites of San Antonio, Northern Samar. The species composition of macro fungi in San Antonio, Northern Samar is presented in Table 1. A total of 26 species were identified and belonged to two (2) Phyla : *Basidiomycota and Ascomycota*, five (5) classes: *Agaricomycetes, Basidiomycetes, Heterobasiomycetes, Pezizomycetes and Tremellamycete,* six (6) orders: *Agaricalees, Auriculares, Pezizales, Phallales, Polyporales, and Tremellales* fifteen (15) families: *Agaricaceae, Amanitaceae, Auriculariaceae, Cortinariaceae, Ganodermataceae, Hapalopicalaceae, Helvellaceae, Hydnangiaceae, Marasmiaceae, Merculiaceae, Phallaceae, Psathyrellaceae, Polyporaceae, Tramellaceae and Trycholomataceae; and twenty two (22) genera: Amanita,Apulloclitocybe, Auricularia, Bjerkandera, Coprinus, Cotinarius, Fomes, Ganoderma, Helvella, Ifundibulicybe, Inocybe, Laccario, Lycoperdon, Marasmius, Phallus, Phenoperus, Pleurocybella, Podocypha, Polyporus, Spongepellis, Tramella and Trametes.*

Table1. The Distribution of Macrofungi in the Island of San Antonio, Northern Samar

Family/Species	Sampling Sites									
	Vinisitahan	Dalupirit	San Nicolas	Rizal	Manraya	Pilar	Burabod	Ward I	Ward II	Ward III
GARICACEAE										
ycoperdon mammiforme (Vent)	✓	x	x	x	x	✓	x	✓	x	x
MANITACEAE										
manita sp. (Pers)	✓	✓	x	x	x	x	x	x	x	x
URICULARIACEAE										
uricularia polytricha (Mont)	✓	✓	✓	x	x	x	✓	x	x	x
ORTINARIACEAE										
ocybe rimosa (Bull)	x	x	x	✓	x	x	x	x	x	x
ortinarius corrugatus (Peck)	x	✓	x	x	x	x	x	x	x	x
ANODERMATACEAE										
anoderma lucidum (Curtis)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
anoderma adspersum (Schulzer)	x	✓	x	x	x	✓	x	x	x	✓
APALOPILACEAE										
erkandera adusta (Willd)	x	✓	x	x	x	x	✓	x	✓	x
ongipellis pachyodon (Pers)	x	x	x	x	x	x	✓	x	x	x
ELVELLACEAE										
elvella lacunosa (Fr)	x	✓	x	✓	x	x	x	x	x	x
YDNANGIACEAE										
iccaria laccata (Scop)	x	x	x	x	✓	x	x	x	x	x

MARASMIACEAE										
Marasmius scoradoniusqa (Fr)	×	×	×	×	✓	×	×	✓	×	×
Pleurocybella porrigens (Pers)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MERULIACEAE										
Podoscypha petalodes (Berk)	×	×	×	×	×	✓	×	×	×	×
PHALLACEAE										
Phallus indusiatus (Vent)	×	✓	×	×	×	×	×	×	×	×
Phallus multicolor (Berk)	×	×	×	✓	×	×	×	×	×	×
PSATHYRELLACEAE										
Coprinus lagopus (Fr)	×	✓	×	×	×	×	×	×	✓	×
POLYPORACEAE										
Fomes fomentarius (L)	×	✓	×	×	×	×	✓	×	×	×
Polyporus arcularius (Batsch)	✓	×	×	×	×	×	×	×	×	×
Trametes hersute (Wulfen)	×	×	✓	×	×	×	×	×	×	×
Trametes trogii (Berk)	×	✓	×	×	×	×	×	×	×	✓
Trametes elegans (Spreng)	×	×	×	×	✓	×	×	×	×	×
Pycnoporus cinnabarinus (Jacq)	✓	×	✓	×	×	×	✓	×	✓	×
TREMELLACEAE										
Tremella fuciformis (Berk)	×	×	×	×	×	×	✓	×	×	×
TRYCHOLOMATACEAE										
Infundibulicybe gibba (Pers)	×	×	×	✓	×	×	×	×	×	×
Ampulloclitocybe clavipes (Pers)	×	×	×	×	×	×	✓	×	×	×
Total: 26 Species	7	12	5	6	5	5	9	4	5	4

LEGEND: ✓ Present × Absent

Distribution of Macrofungi species found in the island of San Antonio, Northern Samar

Scientific Name:
Ganoderma lucidum (Curtis)

Scientific Name:
Ganoderma adspersum (Schulzer)

Scientific Name:
Pleurocybella porrigens (Pers.)

Scientific Name:
Phallus indusiatos (Vent)

Scientific Name:
Lycoperdon mammiforme (Pers)

Scientific Name:
Pycnoporus cinnabarinus (Jacq)

Scientific Name:
Trametes ellegans (Spreng)

Scientific Name:
Cortinarius corrugatus (Peck)

Scientific Name:
Phallus multicolor (Berk)

Scientific Name:
Auricularia polytricha (Mont)

Scientific Name:
Podoscypa petalodes (Berk)

Scientific Name:
Fomes formentaritus (L)

Scientific Name:
Trametis hirsute (Wulfen)

Scientific Name:
Trametis trogii (berk)

Scientific Name:
Bjerkandera adusta (Willd)

Scientific Name:
Spongipellis pachydon (Pers)

Scientific Name:
Laccaria laccata (Scop)

Scientific Name:
Polyporus arcularius (Batsch)

Scientific Name:
Infundibulicybe (Clitocybe) gibba (Pers)

Scientific Name:
Inocybe rimosa (Bull)

Scientific Name:
Ampulloclitocybe (Clitocybe) clavipes (Pers)

Scientific Name:
Coprinus lagopus (Fr)

Scientific Name:
Marasmitus scorodonitus (Fr)

Scientific Name:
Amanita sp. (Pers)

Scientific Name:
Helvella lacunasa (Fr.)

Scientific Name:
Tramella fuciformis (Berk)

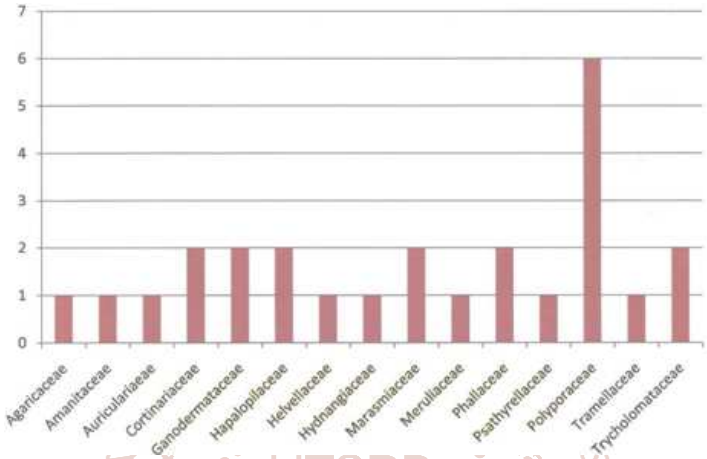

Figure1. Composition of macrofungi based on family

The graph illustrated the composition of macrofungi based on family. A total of fifteen (15) families of macrofungi were identified and collected in ten (10) sampling sites. The family *Polyporaceae* ranked first with six (6) species and was followed by six (6) families namely: *Cortinariaceae, Ganodermataceae, Hapalopilaceae, Marasmiaceae, Phallaceae, and Trycholomataceae* with two (2) species; the remaining families were *Agaricaceae, Amanitaceae, Auriculariaceae, Helvellaceae, Hydnangiaceae, Meruliaceae, Psathyrellaceae, and Trametellaceae* with only one (1) species.

Table2. The Kinds of substrate where macrofungi are found

Family/Species	Kinds of Substrate				
	A	B	C	D	E
AGARICACEAE					
Lycoperdon mammiforme (Berk.)	×	✓	×	×	×
AMANITACEAE					
Amanita sp.(Pers.)	×	×	×	✓	×
AURICULARIACEAE					
Auricularia polytricha (Mont.)	✓	×	×	×	×
CORTINARIACEAE					
Inocybe rimosa (Bull.)	×	✓	×	×	×
Cortinarius corrugatus (Peck.)	✓	×	×	×	×
GANODERMATACEAE					
Ganoderma lucidum (Curtis.)	✓	×	×	×	×
Ganoderma adspersum (Schulzer.)	×	×	×	×	✓
HAPALOPILACEAE					
Bjerkandera adusta (Willd.)	✓	×	×	×	×
Spongipellis pachyodon (Pers.)	✓	×	×	×	✓
HELVELLACEAE					
Helvella lacunosa (Fr.)	×	×	×	×	✓
HYDNANGIACEAE					
Laccaria laccata (Scop.)	×	✓	×	×	×
MARASMIACEAE					
Marasmius scorodonius (Fr.)	×	✓	×	×	×
Pleurocybella porrigens (Pers.)	✓	×	✓	×	×
MERULIACEAE					
Podoscypha petalodes (Berk.)	✓	×	×	×	×
PHALLACEAE					
Phallus indusiatus (Vent.)	×	✓	×	×	×
Phallus multicolor (Berk.)	×	✓	×	×	×

Kinds of Substrate

The macrofungi in the study were mostly found on dead wood, soil, coconut husk, decaying banana trunks, and tree branches.

Fourteen (14) species of macrofungi were found in dead wood. Eight (8) species were found in soil. One (1) species was found in both coconut husk and in decaying banana trunks and seven (7) species were found in the tree branches. Also, two (2) species were found in all sampling site.

Economic Use of Macrofungi

Based on the interview conducted, there were three (3) species that were locally considered or known as edible by the local residents, namely: *Grifola frondosa* or "kurakdot', *Volvariella volvaceae* or "ulaping" and *Volvariella gloiocephala* or "ligbos", but this three (3) species of macrofungi were not present in identified sites during the sampling of the researchers. The twenty-six (26) species are known and familiar to the local residents but their uses or benefits are unknown.

CONCLUSION

The macro fungi species in the study area were mostly growing on the dead wood, soil, and tree branches, while few of them were growing n coconut husks and decaying banana trunks. The respondents are not familiar with the economic use or benefits derived from the macro fungi species found in the sampling sites.

References

[1] Alters, Sandra. 1996. Biology: Understanding Life. Mosby-Year Book, Inc. 11830 Westline Industrial Drive, St. Louis, Missouri 63146 WA.

[2] Arnesto, Lowela Lovely B., 2009, Taxonomic Classification of Fungi in Selected Barangays of Palapag, Northern Samar. College of Science, University of Eastern Philippines, University Town, Northern Samar

[3] Brooker, Robert J,. Eric P. Wilmaier , Linda E. Graham,. And Peter D. Stiling . 2011, Biology, Fourth Edition McGraw-Hill Companies, Inc. 1221 Avenue of the Americas, NY, 10020, USA

[4] Esquillo, Juno Jade T., 2006, Taxonomic Classification of macro fungi in selected Barangays of Lavezares, Northern Samar. College of Science, University of Eastern Philippines , University Town, Northern Samar

[5] Miano, Mary Jane, 2010, Taxonomic Classification of Mushrooms in selected Barangays of Catarman, Norther Samar. College of Science, University of Eastern Philippines, University Town, Northern Samar

[6] Strauss, Erick and Marylin Lisowski, 2000, Biology: The Web of Life, Second Edition, Reprinted by Pearsons Education Asia Ple Ltd. 23 First lok Yang Road, Jurong, Singapore 629733

[7] Tortora, Gerard J,. Berdell R. Funke, and Christine L. Case, 1992, Microbiology: An Introduction. Fourth Edition, Benjamin Cummings Publishing Company, 390 Bridge Parkway, Redwood City, California 94065

[8] Talaro, Kathleen Park 2005, Foundation in Microbiology, Sixth Edition, McGraw-Hill Companies Inc. 1221 Avenue of the Americas, NY, USA

[9] McFadden, Carol H,. and William T. Keeton. 1998, Biology: An Exploration of life, Norton and Company Inc. 1221 Avenue of the Americas , NY, 10110. USA.

[10] Volk, Wesley A,. and Margaret F. Wheeler, 1980, Basic Microbiology, Fourth Edition, J.B Lippincott Company. Reprinted by: National Book Store, Inc., Metro Manila Philippines.