

Analysis of the Diversity of Macrofungary Species that Live in the Environment in the Village of Aldeia Bahabunac, Suco Uma Ki'ik, Administrativo Posto Viqueque, Municipio Viqueque

Zeferino da Costa Brandão¹; Joaozito Barreto²; Miguel Pinto³

^{1,2,3}Departamento de Biologia, Faculdade da Ciência da Educação (F.C.E.), Universidade Oriental Timor-Lorosa'e (UNITAL)

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Abstract: This research is referred to analysis of the diversity of macrofungary species that live in the environment in the village of aldeia bahabunac, suco uma ki'ik, administrativo posto viqueque, municipio viqueque. The aim of this research to identify entophytic macrophages, which live inside plants without causing any apparent damage, have aroused great interest on the part of mycologists. The nature of this relationship has not yet been adequately clarified, assuming that it is an evolved form of symbiosis that may eventually become parasitic. Fungi are of primary importance in different environments, being among the main responsible for the cycling of nutrients, especially in forest ecosystems. Soil is considered one of the main habitats for these organisms, and both filaments and yeasts represent the largest contributors of soil microbial biomass, constituting a group of organotrophic individuals responsible primarily for the decomposition of organic compounds. The technique of the research is a strategy that uses to analyze the data obtained through the quantitative research analysis to make discretion of characteristics morphology and quantitative analyze use the formula of Shannon Wiener [13], Uniformity (Kusrinii 2009) and Wealth Ludowing and Reynold Onrizal (2008). The results obtained during this study occurred, the researchers were able to record the number of species of total 50 (Fifty) and the total number of individuals, 1230 (Fourteen hundred and four), which belong to (twenty-four) of the family. Based on survey data obtained from the study site, then analyzed by 3 (three) formulas as mentioned above, the results obtained is the diversity index (D) = 1.97; index of wealth (R) = 0.61; uniformity index is high and the richness is low, because it is influenced by several factors such as abiotic factors in the research area such as habitat temperature, food competition, and also others activities of living beings, as intervened by human beings. To the biotic factors with the competition between the communities of macrofungoes in the area refers to looking for foods and place and occupy space depends on the capacity of species that occupy most and other species not the capacity always of happens with individual number and to distribute. *Tramete sgibosa*, *Trichaptum biforme*, *Pycnoporus sanguineus*, *Coltricia perenis*, *Poriasu bacida*, *Pycnoporu ssp*, *Polyporus mori*, *Polyporus admirabilis*, *Amanita vaginata*, *Cortinarius rubellus*, *Mycena chlorophos*, *Auricularia politricha*, *Pleurotus ostreatus*, *Panaelus cintulus*, *Daedaleopsis confragosa*, *Trametes sp*, *Pleurotus citrinopiliatus*, *Amanaita virosa*, *Steccherium ochraceum*, *Gimnopillus specbilis*, *Micena galericulate*, *Trametes vilosa*, *Trametes hirsute*, *Geoglossum difforme*, *Ceratiomisa fruticulosa*, *Ganoderma sp*, *Fomitopsis pinicola*, *Cepterpencil*, *Chaga mushroom*, *Cyathus striatus*, *Cortinarius rubellus*, *Tirahau selampaham*, *Polyporus alveolaris*, *Regidoporus sp*, *Amanita mushroom*, *Trametes vibosa*, *Trametes sp*, *Panaelus olivaceus*, *Favolus tenuiculus*, *Xylaria cubensis*, *Ganoderma lucidum*, *Hericium erinaceus*, *Trametes versicolor*, *Polyporos tuberastes*, *Psylosibe caerulipes*, *Picnoporus coccineus*, *Flammulina velutipes*, *Lactarius repraesentaneus*, *Oxyporus populinus*, *Lyophyllum decastes*.

Keywords: Analyzes Diversity, Macrofung Species, Environment.

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I. INTRODUCTION

The Earth As habitats for all living series, which are: animals, plants and microorganisms. The Plantae kingdom is one of the main Groups into which Life on Earth is divided. They are generally autotrophic organisms, whose cells include one or more organelles specialized in the production of organic material from inorganic material and solar energy, the chloroplasts. Also all living beings that like to live in the Plantae World, because in the Plantae World in general there is cymatics which is very cold and there is more quality fertilizer, to take the epiphytic plants Which have several types and with very different characteristics that are distributed on planet Earth.

[7] There are many fungi are macroscopic and there are species that reach considerable size; however, in general, these organisms are microscopic, making it difficult to record the occurrence of countless species that live in the most diverse habitats without being noticed. Living as saprobes, parasites or symbionts and being primarily decomposers, fungi play a fundamental role in aquatic and terrestrial ecosystems. Saprobiotic conditions are found wherever there is organic matter to be decomposed, and fungi are extremely effective in this aspect. Microscopic fungi, as they are more difficult to collect and identify, have a lower number of described specimens compared to the existing collection of macrofungi, although it is expected that the proportion of microscopic to macroscopic fungi is much higher. some species of macrofungi and microfungi can be found in herbaria around the world, constituting part of their collection (mycotheca).

Grande and Sousa (2021) the richness and diversity of spontaneous plants can mirror to a certain extent the richness and diversity of species in the environment, while such parameters for cultivated species would be more linked to socio-cultural factors that promote the introduction of new plants and usage information from external sources. it is suggested that when traditional communities become more exposed to national society, the number of species and knowledge about their use may initially increase, due to external contributions; but, with the deepening of contact, and the resulting socio-economic changes, the tendency will be for plants used for therapeutic purposes to be restricted to cultivated and cosmopolitan invasive species.

East Timor consists mainly of mountainous areas stretching from east to west. the mountain stretches are sometimes disconnected, thus forming valleys and deep ravines. East Timor is one of the countries officially became an independent country on may 20, 2002, but in the beginning it is one of the colonies of the Portuguese and Indonesia. According to Trainor [11], Timor-Leste is one of the outer islands of the Banda arc and is part of the Australian continental shelf. timor island has a length of approximately 470 km and its widest part is a 95 km wide island measuring approximately 31,000 km². While East Timor has a length of 260 km and its widest part is up to 80 km with an area of 14,874 km². Amidst many small river flowing transportation

very difficult. The soil contains lime, coral, dense clay, sand and only some are classified as volcanic soil.

Municipality Viqueque, which belongs to 13 municipalities, exists in the public administrative system of Timor-Leste. Municipality Viqueque there are 5 administrative posts: Watulari, Watu-carbau, Ossu, Lacluta, and Viqueque. Municipio Viqueque is the one that exists in Suco Uma-ki'ik Bahabunac Village in the Wekatar area is the place where the researcher goes to carry out the research result and is located in the southern part that exists in the mountains and close to the edge of the bank.

The fundamental reason for the researcher who carries out research on the macrofungal species that live in the environment in Suco Uma-ki'ik, Viqueque Administrative Post and Viqueque Municipality is that on the border there are many mountains and the tropical climate is colder to facilitate all living beings and include Macrofungi come from variations of different species and families that have the ability to adapt to the best nutrients, temperatures and substrates that favor our lives. Macrofungi are most important in the community that they live in and are good food for others that cannot be consumed and also food for the animals that they consume. These facts are a motivation for researchers carrying out research to increase more knowledge to "Analyze Diversity of Macrofungal Species that Live in their Environment in Suco Uma- Ki'ik, Posto Administrativo Viqueque and MunicipioViqueque".

II. RESEARCH METHOD

The research was carried out from the 15th to the 19th of June 2024. According to Sugiyono (2000:57) the population is made up of objects and subjects that have specific quantitative characteristics and defined as the research object. Therefore, the population of macrofungal species in their environment is present in Aldeia Bahabunac, Suco Uma-ki'ik, Posto administrative Viqueque and MunicipioViqueque. According to Riduwan [15] states that the sample is partially or represent population in an area. Therefore, the sample in this research was a part of the population that is accurately representative. Therefore, this sample "Analyzes the diversity of Macrofungal Species in their Environment found in discontinuous plots in AldeiaBahabunac, Suco Uma-Ki'ik, Posto Administrative Viqueque and MunicipioViqueque.

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Diversity and Uniformity and Wealth index formula was used, which was cited by Shannon Weaner [13].

Diversity Index (H') : Weaner [13].

$$H' = - \sum_{i=1}^s (P_i) \ln P_i$$

III. RESULT AND DISCUSION

Based on her research, which was carried out on the 15th to 19th of June 2024 in Aldeia Bahabunac, Suco Uma-ki'ik, Posto Administrativo Viqueque and Municipio Viqueque, the researcher was able to obtain the total number of species, there are 36 species, the individual number of 1230 species and 16 families of the macrofungi species that live in their environment as they are in the table following:

Table 1 Research Result on the Macrofungus Species that Live in their Environment in Bahabunac Village, Uma-Ki'ik Suco, Viqueque Administrative Post and Viqueque Municipality Make the Family and Habitat of the Macrofungus Species:

| No | Species name | No ind | Family | Habitat |
|----|---------------------------|-------------|------------------|---|
| 1 | Trametes gibosa | 19 | Polyporaceae | Dead wood, its damp condition |
| 2 | Trichaptum biforme | 31 | | |
| 3 | Pycnoporus sanguineos | 27 | | |
| 4 | Coltricia perenis | 11 | | |
| 5 | Perenniporia subacida | 27 | | |
| 6 | Pycnoporus palibini | 5 | | |
| 7 | Polyporusmori | 17 | | |
| 8 | Polyporus admirabilis | 98 | | |
| 9 | Amanita vaginata | 45 | | |
| 10 | Cortinarius rubellus | 5 | | |
| 11 | Mycena chlorophos | 18 | | |
| 12 | Auricularia politricha | 51 | | |
| 13 | Pleurotus ostreatus | 62 | | |
| 14 | Panaelus cintulus | 18 | | |
| 15 | Daedaleopsis confragosa | 21 | Pleurotaceae | |
| 16 | Trametes sp | 42 | | |
| 17 | Pleurotus citrinopiliatus | 32 | Amanitaceae | Remains of dead trees, their damp condition |
| 18 | Amanita virosa | 18 | | |
| 19 | Steccherium ochraceum | 14 | | Cow feces, the damp condition |
| 20 | Gimnopillus specbilis | 48 | Micaceae | Dead trees, their damp condition |
| 21 | Mycena galericulate | 142 | | |
| 22 | Trametes vilosa | 40 | Cortinariaceae | |
| 23 | Trametes hirsute | 7 | | |
| 24 | Geoglossum difforme | 31 | Xylariaceae | |
| 25 | Ceratiomisa fruticulosa | 10 | Ganodermateaceae | Dead trees, their damp condition |
| 26 | Ganoderma sp. | 13 | | |
| 27 | Clitocybesp | 31 | Psathyrellaceae | |
| 28 | Fomitopsis pinicol | 39 | | |
| 29 | Chaga mushroom | 12 | Polyporaceae | |
| 30 | Cyathusstriatus | 29 | Auriculaceae | |
| 31 | Cortinar iusrubellus | 52 | Xylariaceae | |
| 32 | Tirahau selampaham | 67 | Stereaceae | |
| 33 | Polyporu salveolaris | 9 | Cortinariaceae | |
| 34 | Regidoporus sp | 6 | Geoglossaceae | |
| 35 | Amanita mushroom | 40 | Incertaceae | |
| 36 | Clitocybe sp | 93 | Hymenochaetaveae | |
| | Total individo | 1230 | | |

Sources: First Data After Preparation, July 28, 2024

Table 2 Indise Shannon Wiener [13] Diversity, Uniformity, Richness, Species About Analyzes Macrofungal Species Living in the Environment in Aldeia Bahabunac, Suco Uma-Ki'ik, Posto Administrativo Viqueque and Municipio Viqueque

| No | Especies Name | Ni | Pi | LnPi | Pi (LnPi) | Interpretation |
|----|-----------------------|----|------|-------|-----------|----------------|
| 1 | Trametes gibosa | 19 | 0,01 | -4,60 | -0,04 | |
| 2 | Trichaptum biforme | 31 | 0,02 | -3,91 | -0,07 | |
| 3 | Pycnoporus sanguineos | 27 | 0,04 | -3,21 | -0,12 | |
| 4 | Coltricia perenis | 11 | 0,06 | -2,81 | -0,04 | |

| | | | | | | |
|----|----------------------------------|-----|--------|-------|--------|--|
| 5 | <i>Perenniporia subacida</i> | 27 | 0,008 | -4,82 | -0,03 | |
| 6 | <i>Pycnoporus palibini</i> | 5 | 0,03 | -3,50 | -0,10 | |
| 7 | <i>Polyporusmori</i> | 17 | 0,06 | -2,81 | 0,16 | |
| 8 | <i>Polyporus admirabilis</i> | 98 | 0,03 | -3,50 | -0,10 | |
| 9 | <i>Amanita vaginata</i> | 45 | 0,02 | -3,91 | -0,07 | |
| 10 | <i>Cortinarius rubellus</i> | 5 | 0,02 | -3,91 | -0,07 | |
| 11 | <i>Mycena chlorophos</i> | 18 | 0,03 | -3,50 | -0,10 | |
| 12 | <i>Auricularia politricha</i> | 51 | 0,02 | -3,91 | -0,07 | |
| 13 | <i>Pleurotus ostreatus</i> | 62 | 0,01 | -4,60 | -0,04 | |
| 14 | <i>Panaelus cintulus</i> | 18 | 0,02 | -3,91 | -0,07 | |
| 15 | <i>Daedaleopsis confragosa</i> | 21 | 0,03 | -3,50 | -0,10 | |
| 16 | <i>Trametes sp</i> | 42 | 0,01 | -4,60 | -0,04 | |
| 17 | <i>Pleurotus citrinopiliatus</i> | 32 | 0,02 | -3,91 | -0,07 | |
| 18 | <i>Amanita virosa</i> | 18 | 0,01 | -4,60 | -0,04 | |
| 19 | <i>Steccherium ochraceum</i> | 14 | 0,04 | -3,21 | -0,12 | |
| 20 | <i>Gimnopillus specbilis</i> | 48 | 0,006 | -5,11 | -0,03 | |
| 21 | <i>Mycena galericulate</i> | 142 | 0,10 | -2,30 | -0,03 | |
| 22 | <i>Trametes vilosa</i> | 40 | 0,01 | -4,60 | -0,04 | |
| 23 | <i>Trametes hirsute</i> | 7 | 0,007 | -4,96 | -0,03 | |
| 24 | <i>Geoglossum difforme</i> | 31 | 0,004 | -5,52 | -0,02 | |
| 25 | <i>Ceratiomisa fruticulosa</i> | 10 | 0,003 | -5,80 | -0,01 | |
| 26 | <i>Ganoderma sp.</i> | 13 | 0,009 | -4,71 | -0,04 | |
| 27 | <i>Clitocybesp</i> | 31 | 0,01 | -4,60 | -0,04 | |
| 28 | <i>Fomitopsis pinicol</i> | 39 | 0,0007 | -7,26 | -0,005 | |
| 29 | <i>Chaga mushroom</i> | 12 | 0,002 | -6,21 | -0,01 | |
| 30 | <i>Cyathusstriatus</i> | 29 | 0,008 | -4,82 | -0,03 | |
| 31 | <i>Cortinar iusrubellus</i> | 52 | 0,004 | -5,52 | -0,02 | |
| 32 | <i>Tirahau selampaham</i> | 67 | 0,01 | -4,60 | -0,04 | |
| 33 | <i>Polyporu salveolaris</i> | 9 | 0,01 | -4,60 | -0,04 | |
| 34 | <i>Regidoporus sp</i> | 6 | 0,01 | -4,60 | -0,04 | |

Based on the research results on the species of macrofungi in the research area, 36 species and 1230 individuals were collected, which have 16 families as: *Trametes gibbosa*, *Trametes sp*, *Trametes vilosa*, *Trametes hirsute*, *Trametes versicolor*, *Trametes porioides*, *Trametes sp*, *Polyporusmori*, *Polyporus admirabilis*, *Polyporus tuberastes*, *Polyporus alveolaris*, *Pycnoporus coccineus*, *Pycnoporus sanguineus*, *Pycnoporus spalibini*, *Favolus tenuiculus*, *Perenniporia subacida* Family (polyporaceae) *Pleurotus ostreatus*, *Pleurotus citrinopiliatus* Family (pleurotaceae) *Gimnopillus specbilis*, *Cortinarius rubellus*, *Cortinarius orellanoides* Family (cortinariaceae) *Amanita vaginata*, *Amanita virosa*, *Amanita mushroom* Familia (amanitaceae) *Mycena chlorophos*, *Mycena galericulate* Family (miceceae) *Xylaria cubensis*, *Daedaleopsis confragosa* Family (xilariaceae) *Ganoderma lucidum*, *Ganoderma aplanatum* Family (ganodermateceae) *Lyophyllum decastes*, *Ceratiomisa fruticulosa* Family (Lyophyllaceae) *Auricularia politricha* Family (Auriculaceae) *Steccherium ochraceum* Family (Stereaceae) *Geoglossum difforme* Family (Geoglossaceae) *Coltrici aperenis* Family (Hymenochaetaveae).

The highest diversity index of organisms depends on good conditions. The more favorable climate, combined with the great diversity and abundance of food, allows the existence of many ecological niches that were readily filled by Macrofungi. In fact, many species are only found in a certain type of habitat, and are often considered as indicators

of good environmental quality. These “indicator species” can respond very quickly to environmental changes, disappearing from their habitats as soon as any more drastic change occurs. To determine the Diversity of macrofungal species that occurs in the research area, based on the Diversity according to the Shanon Wiener formula [13], which when its value is lower than 0 to 1.5 = low; a value from 1.5 to 3.0 = moderate; and while the value more than 3.0 = high [13].

The Diversity Index is a value that is used to make a comparison between the total of 36 species and also the total number of 1230 individuals within the community. To find out the index value of the diversity of Macrofungi that exist in Suco Uma-ki'ik, Posto Administrativo Viqueque and Municipio Viqueque, the researcher counted using Shanon Wiener's diversity index formula, based on the effort and her desire as a researcher to counting the data found in this area depends on the result. Thus, the final result obtained is $H' = 1.97$ which shows how the bird species that occur in the area referred to are classified as relatively Medium diversity.

With reference to the aforementioned interpretation, the diversity index that exists in Suco Uma-ki'ik, Viqueque administrative post and Viqueque Municipality, the category is medium because the diversity index value depends on the variety of species of macrofungi that exists in the research area, the distribution of this species with the largest individual number is *Mycenagalericulate* 142, *Coltriciaperenis* 97 and *Polyporusmori* 98 individuals this species is larger ability to

adapt and most dominate in distributing in an environment observing in the area referred. The species that does not mention this means that the individual number is smaller in the research area because it has less capacity to adapt to environmental factors to survive [10].

The Diversity Index is a weighted measure relating the distribution of individuals shown with the number of species. Then some factors that support the plants that together in this area that is a place to support nutrients such as dead leaves and dead stems that offer nutrients to the species macrofungi, temperature or humidity is more guarantee of some to guarantee the life of all the area referred to, (Kusrinii; 2009).

Surface temperature is influenced by factors such as latitude, altitude, season, time of day, flow rate and depth. The rise in temperature in a body of water is generally caused by industrial waste (sugarcane industries, for example) and thermoelectric plants. The closed capsules were then subjected to heating in a forced air circulation oven, with temperatures of ($< 20 - 38^{\circ}\text{C}$), and other species with better capacity can withstand temperatures (> 48 and 58°C) [10]. The humidity that exists in the research area at $21-45^{\circ}\text{C}$ also does not support the survival of macrofungi, because there is a higher temperature in the area, macrofungal species are dead, only there are species that are more capable of living in dry weather [6].

Humidity depends on the presence of sunlight and wind speed, that there is an environment that produces a temperature lower or higher in the place in the mediation with humidity 68°C which means lower and higher, based on 0°C to 100°C more than temperature 0°C to 50°C is the lowest temperature, it also depends on the behavior of the evolved natural physicist that makes an organism capable of surviving and reproducing in its respective habitat with the humidity that needs 70%, 80% and 90% more sufficient for macrofungi, (Santoso, et al 1999).

Fertility is the capacity of the soil to provide nutrients to plants, both in terms of origin, current potential and operational potential. Fertility for macrofungi is $0 - 7.5$, which is the most optimal for the humid environment in which the organism grows very well [3].

The pH in the research area, which already measures $6.9 - 7.4$, does not influence the growth of macrofungi in reproduction and increases the number of nutrients that are sufficient to support the macrofungal species that live in this area. Fertility is the ability of the soil to provide nutrients to plants both in origin, current potential and operational. Fertility for macrofungi as $0 - 7.5$ which is most optimal for the organism's humid environment grows very well. The fertility measured in this area of research is $3.9 - 7.8$ which is sufficient nutrients for the growth of macrofungi. Because in this area the macrofungal species that adapt most to their ability to live in the environments [8].

IV. CONCLUSION

To determine the Diversity of macrofungal species that occurs in the Wecatar area based on the Diversity according to Shanon Wiener [13], that when its value is lower 0 to 1.5 = low; the value from 1.5 to 3.0 = medium; and while the value more than 3.0 = high. Thus, the result of the Diversity Index with the value is $H' = 1.97$, which shows how the species of macrofungi that occur in the area in question are classified as having relatively Medium diversity. The observation I have already made in relation to the factors that cause wealth already has an impact on diversity. With the reason that the richness index shows us, it is already a parameter that you can use to find out about the diversity of the species within a community that is used for everyday consumption because it is good food and nutrients for the community, as well as other animals that consumption of macrofungi in the research area, this is a biotic factor that always affects growth, development and distribution.

The pH in the research area, which already measures $6.9 - 7.8$, does not influence the growth of macrofungi to increase the number of nutrients that are sufficient to support reproduction. Fertility for macrofungi as $0 - 7.5$ which is most optimal for the organism's humid environment grows very well [8]; [9]. Fertility measuring $3.9 - 7.8$ is sufficient nutrients for the growth of macrofungi.

SUGGESTION

As part of the researcher's analysis of the Diversity of Macrofungal Species that Live in their Environment in AldeiaBahabunac, Suco Uma-Ki'ik, Posto Administrative Viqueque and MunicipioViqueque in the Wecatar area, the following must be observed with the general conditions and their implications. : The community uses this Wecatar area with community places to carry out human activities. Communities also use macrofungi that do not have poison to consume in this life. Macrofungi is very important for making traditional medicine, industrial manufacturing and in the future it conserves more to lead to the quality and quantity of plant diversity in this area of Wecatar, Municipality of Viqueque and also the nation of East Timor.

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