

The Use Values of Macro Fungi in Lung Ngoc Hoang Nature Reserve, Vietnam

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ABSTRACT

From the survey results on the use value of macro fungi in Lung Ngoc Hoang, there are 16 species of edible and 16 species of medicinal values. Besides, 12 species of wood-destroying fungi and 3 species of poisonous macro fungi were found in the study area. However, the survey team also found many species that could not be identified due to many factors affecting sample quality at the time of sampling. Among the factors affecting the growth of the above groups of fungi, such as temperature, humidity, light and human activity at Lung Ngoc Hoang nature reserve, environmental factors affect the size and appearance of fungi while human activity alters their distribution due to the impact of fertilizers on the soil in the area.

Key words : Lung Ngoc Hoang Nature Reserve, Macro fungi, Use values²

Introduction

Vietnam is considered as one of the centers of high biodiversity. The fauna and flora of the higher order have been studied quite fully (Le *et al.*, 1999). However, lower microorganisms in general and fungi in particular have only been initially studied. Currently, there are about 1,400 species of macro fungi reported from Vietnam. The Diversity of Vietnamese macro fungi belongs to the order Agaricomycetes (Kiet, 1998). Recent studies show that about 3000 species of fungi have been recorded for the territory of Vietnam, of which there are about 1800 species of macro fungi. The macro fungi of Vietnam have very high resource value, such as: edible macro fungi (about 250 species), medicinal macro fungi (230 species), poisonous macro fungi (35 species) and many species that can be applied in biotechnology study and the environment (Pham, (1999); Jiri Baier, 1991).

In addition to the nutritional and medicinal value

of macro fungi, saprophytic fungi play an important role in the cycle of matter and energy in nature. Saprophytic fungi use their yeast system to break down organic matter, dried plant leaves, and humus into humus and minerals (Kiet, 1998). According to Pham Hoang Ho (1961), a group of macro fungi found that destroy wood and are parasitic on wood such as *Trametes hirsuta*, *Ganoderma applanatum* and *Schizophyllum commune*,...

Because there are many uses for human life, the survey of use values and factors affecting the growth of macro fungi to assess the status of natural macro fungi populations in areas deemed necessary. However, studies on macro fungi in the South and the Mekong Delta have been conducted somewhat less than in other regions of Vietnam. The collection and identification of macro fungi species according to their use value in the Mekong Delta and the South of Vietnam is an urgent need. In this paper, we will introduce some values of using macro fungi collected in the Mekong Delta, especially in Lung Ngoc

Hoang nature reserve, in Phuong Binh commune, Phung Hiep district, Hau Giang province. This will give an overview of the current status of fungi in this area.

Experimental

The study was carried out at Lung Ngoc Hoang (LNH) nature reserve in Phuong Binh commune, Phung Hiep district, Hau Giang province. (Fig. 1).

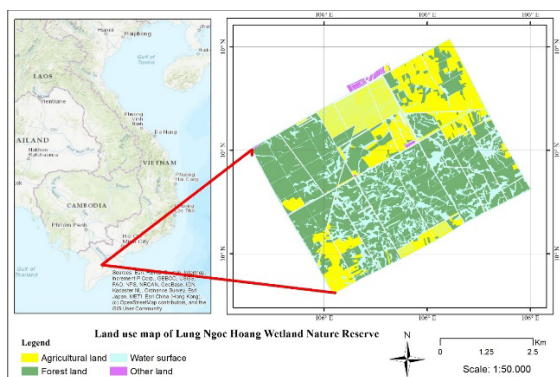


Fig. 1. Map of LNH Wetland Nature.

Materials and Methods

Survey methods suitable for the subjects will be selected, including direct investigation, observation, field sampling for survey groups. Based on the topographic map of the area, 30 general survey points will be investigated, through the main habitats that need to be monitored, assessed and sampled. At each main survey point, samples were collected along the route passing through representative sampling points, at representative sampling points, samples were collected with a radius of 10m. Collect all fungi that appear on the survey area.

Results and Discussion

Classification of mushrooms by use value. From the research results, it is shown that the resources of the macro fungi system in Lung Ngoc Hoang are quite diverse in terms of use value, including groups of useful fungi: edible macro fungi and medicinal macro fungi. There are also several species of fungi that are poisonous and destructive to wood (Fig. 2).

From Figure 2, it can be seen that the number of macro fungi species found during the survey at Lung Ngoc Hoang is quite similar in terms of uses. In terms of medicinal and food values, 16 species

were found, accounting for 20% of the total assessed species. In addition, wood-destroying species with 12 species accounted for 14.8% of the total identified species. Notably with the appearance of 3 poisoning species (*Microporus xanthopus*, *Hypholomafasciculare*, *Leucocoprinus birnbaumii*) accounting for 3.75% of the total evaluated species. In addition, there are 40 species with unidentified uses, accounting for 50%.

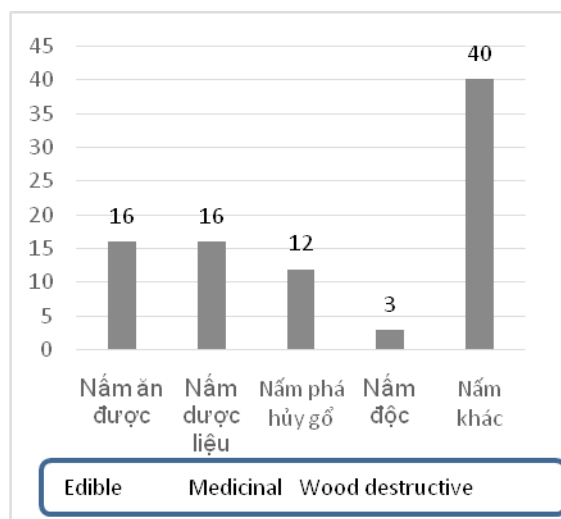


Fig. 2. Number of species by use of fungi.

Factors affecting the growth and distribution of fungi. Temperature affects the growth and development of fungi. Each species of fungus has an optimal growth temperature range. If the temperature is lower or higher, the fungus is difficult to grow and may die. When the temperature increases, the rate of biochemical reactions increases rapidly, so growth and development increase rapidly; but increased to a certain limit, the temperature continues to increase, causing protein and nucleic acids to be destroyed, the growth rate is reduced, even causing the fungus to die. The average temperature of HauGiang province in Vietnam in September and October is 28 °C.



Fig. 3. Edible (left) - *Auricularia polytricha* and medicinal macrofungi (right) - *Pluteuspe tasatus*.

For macro fungi, the optimum temperature for mycelial growth is 30-35 °C and for the formation of fruiting bodies is 30 °C \pm 2 °C. From 10 - 20 °C, the fiber growth is weak. At 20 °C, after 12 hours of death, the whole fruit body formed a pinnacle and stopped the growth of the spherical fruit body. Below 15 °C and above 45 °C no fruit bodies appear.



Fig. 4. Wood Destructive (left) - *Tramestesseabrosa*, Poisonous macro fungi (right) - *Leucocoprinus birnbaumii*.

The suitable temperature for *Ganoderma lucidum* to grow is from 22 °C to 28 °C. Therefore, in Lung Ngoc Hoang Nature Reserve, 4 species of *Ganoderma* were found. *Humidity*. Fungi at different growth stages have different moisture requirements and in each stage the fungus also needs different humidity. For species *Volvariella volvacea* (straw mushroom), suitable humidity for fungal growth is about 80%. Confronted with *Ganoderma lucidum* the appropriate humidity for growth is 75% - 85% *Light*. Depending on the different macro fungi species, the need for light will be different. In each stage of development, the need for light of the same fungus is different. If the light is not suitable, the fungus will be deformed. For example, for *Ganoderma lucidum*, under direct sunlight, the mushroom body is easy to dry and harden. If the light is weak, then the cell pigmentation is poor, the fungi caps have no luster. For straw mushrooms: white



Fig. 5. *Ganoderma malucidum* has no shine (A) *Ganoderma lucidum* is dry (B).

color means lack of light, dark black color means too much light and mouse gray color means enough light (Fig. 6).



Fig. 6. Light affects the color of straw mushrooms.

Human activities. In addition to the effects of natural factors, human activities also affect the distribution of fungi in Lung Ngoc Hoang nature reserve. The majority of households with arable land in Lung Ngoc Hoang assessed that the level of mild alum contamination accounted for 12%, the average accounted for 73%, that was heavily contaminated with 12%, and was not contaminated with alum at 3%. In addition, the sugarcane growing households use more fertilizer than the rice farmers, but both focus on chemical fertilizers and do not use organic fertilizers, so the soil will be easily degraded, lost its structure and loose. scattered, organic content decreased (Nguyen Thi Hong Hoa, 2015).

According to Nguyen Dinh Sinh (2011), the humidity, aeration, temperature along with the structure of the soil (especially topsoil) have affected the distribution of plant species and their root system. During fungi sampling at Lung Ngoc Hoang, it was found that in agricultural habitats the fungus appeared less frequently than in forest habitats.

Conclusion

In summary, the number of edible and medicinal macro fungi found is about 4 times and 5 times higher than the number of wood-destroying fungi and poisonous samples surveyed. In addition, the people's activities on agricultural land habitats have reduced soil quality, leading to less fungal growth and development as well as less distribution of fungi in agricultural habitats than in forest habitats.

Conduct assessments on important indexes, abundance, dry biomass of species, resource value of fungi, etc. The above studies will be important data contributing to complete data on the fungal flora of the area. Mekong Delta region in particular

and of Vietnam in general

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