
Some species of macrofungi at Puncan, Carranglan, Nueva Ecija in the Philippines

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Mushrooms and macrofungi were collected at Puncan, Carranglan, Nueva Ecija, Philippines in during dry season. There were identified into 7 species. With this, one species belong to Order Tulasnellales or Tremellales (Jelly Fungi), Family Auriculariaceae which is *Auricularia fuscusuccinea*. Another 4 species belong to Order Polyporales; Family Polyporaceae which are *Gloeoporus dichrous* (Fr.) Bres, *Coltricia perennis* (Fr.) Murr, *Trametes versicolor* (L.: Fries) Pilt and *Phellinus pini* (Fr.) Ames. Out of these, 2 species belong to Order Agaricales (Mushroom); Family Tricholomataceae which is *Hobenbuebelia petaloides* (Bull ex Fr.) Schulz and Family Cantharellaceae which is *Cantharellus minor* Pk. It is noticed that our survey were done in dry season, high temperature and low humidity which found that the climate and whether are not favorable for mushroom and other fungi growing. Since then, it is indicated that the species found in this season are rarely fresh but their specimens mostly dried.

Key words: *Auricularia*, *Gloeoporus*, *Coltricia*, *Trametes*, *Phellinus*, *Hobenbuebelia*, *Cantharellus*

Introduction

Mushrooms and macrofungi need moisture to develop. There is an optimum period of mushroom season when the most of mushrooms and macro fungi come to appear. Then it may span several months or more than half the year. The peak mushrooms and macrofungi season for each region is differ from each ecological climate. Each year is a little different; the season may be early or late depending on rainfall and temperature (Arora, 1991). Quimio (1978) also stated that the best place and time to collect mushrooms and macrofungi, especially freshy fungi is during raining season in a very humid place with diffused sunlight, so a forested area is a good and excellent collecting ground. These fungi love to grow on top of dead and decomposed

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leaves and logs. Whenever possible, specimens at different stages of development should be collected by digging (not pulling) them up so as not to damage their bases. For those attached on dead logs and woods, efforts should be made to scrape a piece of the wood or bark on which the specimen is attached. Specimens should be wrapped individually in some paper and carefully placed in flatbottomed baskets or boxes. A white card or paper slip indicating the place where it is collected is inserted or clipped in each package. Upon returning from the collecting trip, the materials should be examined as soon as possible and if it is not possible to name or identify the specimen right away, the information on characters likely to be affected by drying must be noted down. The specimens may also be photographed at this stage. Spore prints should be taken right away to determine the color of the spores in the case of Agaricales (mushrooms).

Jelly fungi differ fundamentally from Basidiomycetes in the structure of their basidia, which are partitioned (septate) or forked rather than simple and clublike. There are not considered to be mushrooms. Jelly fungi can usually be told in the field by the gelatinous (jellylike) or rubbery texture that gives them their name. Arora, D. (1986) Stated that the design of the basidium forms the basis for dividing the jelly fungi into three separate groups. The Tremellales, which are the most common, have obliquely or longitudinally septate basidia that look like hook, the Auriculariales have transversely septate basidia, and the Dacrymycetales have Y-shaped basidia that look like tuning forks. Jelly fungi are classed as Hymenomycetes.

Alexopoulos and Mims (1979) stated that the subclass Phragmobasidiomycetidae is composed of fungi whose metabasidium is typically divided into four cells by transverse or longitudinally septa. The subclass consists of the orders Tremellales, Auriculariales, and Septobasidiales. The Tremellales and Auriculariales are composed primarily of saprobic forms and Septobasidiales are parasitic or parasitic-symbiotic on scale insects. Members of the order Auriculariales are characterized by the production of a metabasidium that is divided by transverse septa into four cells. The fruiting bodies bearing the basidia vary from a simple web of hyphae, as in *Helicobasidium*, to the well-developed, large, fruiting body of *Auricularia*, which is gelatinous and somewhat leathery. The basidiocarps (fruiting body) of *Auricularia polytricha* are edible and kit containing all the necessary ingredients to grow the fungus is commercially available. McNabb(1973) placed all these fungi in the single family Auriculariaceae, although some authors also recognize a second family, the Phleogenaceae, In McNabb's key to the genera of Auriculariaceae, 19 species are recognized. *Auricularia auricular* is probably the most common and widely distributed of the Auriculariales,

produces the largest fruiting body of any member of this family. This is an ear-shaped, gelatinous structure that consists of binucleate hyphae bearing clamp connections. The hymenium is formed on the underside, with a large number of hyphal ends developing into basidia. At first binucleate, the young basidia become unicleate by karyogamy, then the zygote nucleus undergoes meiosis, and the elongated basidium becomes four-celled by development of three transverse septa. One septum forms after the first nuclear division, and the other two form after the second. A sterigma grows out from each cell, and turns in the same direction toward which the metabasidium is pointing. Growth continues until the strigmata protrude above the surface of the jelly fungi that envelops the entire basidiocarp. A curved basidiospore develops on the tip of each sterigma, and the nuclei migrate into the basidiospore. The basidiospores of *Auricularia auricular* become multiseptate at the time of germination. The fusion of hyphae issuing from basidiospores and the production of clamp connections in dikaryotic hyphae. *Auricularia auricula* is one of the fungi in which the dolipore septum was discovered by Moore and McAlear (1962).

Musngi, R.B., Abella, E.A., Lalap, A.L. and Reyes, R.G. (2005) reported that the most taxonomic work on macrofungi in the Philippines has focused on general descriptions of *Basidiomycota*. They also stated that several local researchers in the Philippines have tried to document the different macrofungi that inhabit the mountainous areas of the country. They described the four species of *Auricularia* (*A. auricula*, *A. fuscossucinea*, *A. polytricha*, *A. tenuis*), which were collected in the campus of the Central Luzon State University. Seven host trees for *Auricularia* were noted as follows: rain tree (*Samanea saman*), coconut (*Cocos nucifera*), ipil – ipil (*Leucaena leucocephala*), mahogany (*Sweitenia mahogany*), mango (*Mangifera indica*) and rubber tree (*Hevea brasiliensis*). Among these host trees, rain trees supported the highest number of *Auricularia* species identified.

The other mycologists had been reported in the Philippines. For instance, study on the mushroom diversity at Mt. Malinao, Albay where they reported 9 species of *Tricholomataceae*, 3 species of *Coprinaceae*, 2 species of *Pluteaceae* and 1 species of *Auriculariaceae*. (Daep and Cajuday, 2003). The species of basidiomycetous fungi of Mt. Apo, Mindanao had been recorded 87 species representing 25 genera which were identified as *Agaricus*, *Amanita*, *Armillaria*, *Cantharellus*, *Clavaria*, *Corticium*, *Coprinus*, *Cyphelia*, *Dictyophora*, *Fomes*, *Ganoderma*, *Hydnum*, *Hygrocybe*, *Laetiporus*, *Marasmius*, *Phellinus*, *Phleogena*, *Pholiota*, *Polystictus*, *Rigidoporus*, *Russula*, *Schizophyllum*, *Stereum*, *Termitomyces* and *Trametes* species. Biadnes and Tangonan (2003). In Mt. Makiling, Laguna, Quimio (1996) conducted a floristic survey of *Agaricales*. In Nueva Ecija, Reyes *et al.* (1997) isolated the

mycelia of *Collybia reinakena* from Puncan, Carranglan, Nueva Ecija which is a virtually unknown edible specie that proliferated after the great earthquake that jolted Luzon Island in 1991.

Villaceran, A.B., Kalaw, S.P., Nitural, P.S., Abella, E.A. and Reyes, R.G. (2006) have been reported on edible mushroom, *Pleurotus sajor caju* (Fr.) Singer as one of the popular edible mushrooms in the Philippines, is locally known as *kabuteng pamaypay* and is well adapted and commercially cultivated in the provinces of Central Luzon (Higaki *et al.* 2000). It became popular in the Philippines during the later part of the 1980's (Quimio, 1990), it was introduced to the rural people of Central Luzon in the province of Nueva Ecija during the early 1990's by the Center Luzon State University and the Department of Science and Technology (Reyes *et al.*, 1997).

Nueva Ecija is the largest province and the biggest rice producer of Central Luzon, thus, often referred to as the "Rice Bowl of the Philippines." Among its main attractions is the Pantabangan River, the country's first multi-purpose infrastructure, which stands today as a phenomenon in Filipino engineering feats. Another is the Pampanga river, cutting across a rich valley floor, famed for irrigation, the generation of hydroelectric power, and the mitigation of flood damage. Nueva Ecija is also the agri-tourism pilot site in Central Luzon due to the presence of the Central Luzon State University in the province. Its other worthwhile attractions include the Minalungao National Park, Rizal Hot Spring, Burburayok Springs and Pajanutic Falls, Barrio Puncan in the town of Carranglan, among others. Carranglan is a 3rd class municipality in the province of Nueva Ecija, Philippines. According to the 2000 census, it has a population of 31,720 people in 6,603 households. Carranglan is politically subdivided into 17 barangays (local governments) and Puncan is one of barangay. The whether is high temperature, low humidity during dry season.

The objective of the study was to survey, collection and identification of mushroom and macrofungi at Puncan, Carranglan, Nueva Ecija, Philippines.

Materials and methods

Survey had been taken in the forest area at Puncan, Carranglan, Nueva Ecija, Philippines. The specimens were collected, took photos and kept into plastic bags and brought to Department of Biology, Central Luzon State University (CLSU). These fungi grow on top of dead and decomposed leaves and logs. Specimens at different stages of development would be collected by digging (not pulling) them up so as not to damage their bases. For those attached on dead logs and woods, efforts should be made to scrape a piece of

the wood or bark on which the specimen is attached. A paper slip indicating the place where it is collected and placed in each plastic bag. The other macrofungi and mushrooms were also observed and collected.

Upon returning from the collecting trip, the materials were examined and morphological characteristics were recorded and identified into specie level by comparison to literatures. The information on characters to be affected by drying was noted down. The specimens were measured, noted down for the shape, size, color and other characteristics. Morphological characters were taken down note and compared to the field guides as the taxonomic keys according to Quimio (1978), Soyong (1994), Arora *et al.* (1991) and others and especially *Auricularia* spp from Musngi, R.B., Abella, E.A., Lalap, A.L. and Reyes, R.G. (2005). Description of each species was described according to the collected specimens and identified which compared to the literatures.

Results

Mushrooms and macrofungi were collected at Puncan, Carranglan, Nueva Ecija, Philippines in during dry season on 5 April 2008. It was found and identified into 7 species. These are belong to Order Tulasnellales or Tremellales (Jelly Fungi), Order Polyporales; Family Polyporaceae, Order Agaricales (Mushroom); Family Tricholomataceae and Family Cantharellaceae. The detail descriptions were described as follows:-

Auricularia fuscusuccinea (Mont). Henn .

Description: Fruiting body 3 - 6 cm or more; across, irregularly cup-shaped or ear-shaped, reddish brown, gelatinous, drying hard,; laterally attached without a stalk, the outer surface covered with very short, grayish hairs. Fertile surface grayish or pale brown, usually wrinkled or veined. Flesh thin, slightly translucent; no distinctive smell. Spores deposit white.

Habitat: on dead woods or branches, usually gregarious.

Edibility: edible (Fig. 1)

Gloeoporus dichrous (Fr.) Bres.

Description: Fruiting body: resulminate to slightly shelflike and overlapping with the edges often curved up to form small, elongated, narrow shelf up to 10 cm across, 4 cm wide, 0.5 cm thick at the base, with a sharp, undulating margin; upper surface white to cream, with concentric bands or smoother, depending on weather condition during the growth. Tubes rubbery when fresh, resinous to horny when dry and old. Pores 4-6 per mm, round to

angular; surface reddish, becoming dark purplish then brown when old. Flesh up to 4 mm thick.

Phillips (1971) reported that spores cylindrical, smooth 3.5-5.5x0.7-1.5 μ .

Habitat: on the dead wood

Edibility: not edible (Fig. 2).



Fig. 1. *Auricularia fuscossuccinea* (Mont.) Henn.



Fig. 2. *Gloeoporus dichrous* (Fr.) Bres.

***Coltricia perennis* (Fr.) Murr.**

Description: Cap up to 10 cm across, circular but often blending into adjacent specimens when growing in groups; thin, waxy margin; pale brown to deep brown then grayish brown to black in age, with dense, concentric bands of color; tough and leathery, becoming brittle and hard when dry; velvety with different tomentum from one color zone to another, reflecting different growth conditions. Tubes up to 3 mm deep; cinnamon to rusty brown. Pores 2-4 per mm, angular, thin-walled, slightly decurrent; surface brown or dark brown in age. Stem 15-35 x 2-10 mm central; dark brown. Flesh 1-2 mm thick, dense;

rusty brown, paler toward the cap. Phillips (1991) reported that spores ellipsoid, smooth, 6-9x3.5-5 u. Deposit pale yellow brown.

Habitat: on the ground on paths, roadsides, in woods.

Edibility: not edible (Fig. 3)



Fig. 3. *Coltricia perennis* (Fr.) Murr.

***Trametes versicolor* (L.: Fries) Pilt**

Description: Cap: 2-7 cm broad, 1-3 mm thick, fan-shaped, overlapping, leathery, concentrically zoned with contrasting shades of yellow, red, brown, and blue; zones alternately velvety and smooth. Tubes: white to pale yellow; pores 3-5 per mm, angular. Stalk: absent.

Horn *et al.* (1993) reported that spores: 4-6 x 1.5 -2 u, cylindrical to sausage shaped, smooth (Fig. 4)



Fig. 4. *Trametes versicolor* (L.: Fries) Pilt

***Phellinus pini* (Fr.) Ames**

Description: Bracket 2-20 cm across, 1-15 cm thick; hoof-shaped, fan-shaped, or shelflike; tawny to dark reddish brown or brownish black in age, with the margin often brighter; hard, crusty, rough or cracked, minutely hairy, generally curved. Tubes: up to 6 mm deep. Pores: circular to angular; dingy yellow-tawny. Stem minute or none. Flesh tough; tawny to tan or ochre.

Philips (1991) reported that spores globose or subglobose, smooth 4-6 x 3.5-5 u. Deposit brown.

Habitat singly or in rows on living or recently dead trunks (Fig. 5).



Fig. 5. *Phellinus pini* (Fr.) Ames

***Hobenuobelia petaloides* (Bull ex Fr.) Schulz**

Description: Brownish, fan-shaped cap with grayish gill descending very short stalk. Cap: 2.5-7.5 cm wide, 5-10 cm long; fan to spatula-shaped; margin incurved, becoming lobed to wavy; moist, with gelatinous feel, smooth; brownish or paler; base white-hairy. Gills: descending stalk to base, crowded narrow; whitish to grayish, edges fringed. Stalk: very short, compressed, hairy. Lincoff (1981) reported that spores: 7-9 x 4.5-5 u; elliptical, smooth, colorless. Pleurocystidia huge, abundant, with encrusted tip

Edibility: Edible

Habitat: on logs and stumps, grow on buried wood or wood debris (Fig. 6).



Fig. 6. *Hobenuobelia petaloides* (Bull ex Fr.) Schulz

***Cantharellus minor* Pk.**

Description: Cap 0.5-3 cm, convex with an inrolled margin, then flat to depressed or funnel-shaped, thin, waxy at the margin; yellow to pale orange; smooth. Fertile undersurface of cap with very narrow; and descending stem; pale yellow-orange. Stem 15-50 x 3-10 mm; yellow-orange; smooth. Flesh soft; pale yellow. Odor pleasant.

Phillips (1991) reported that spores ellipsoid, smooth, 6-11.5 x 4-6 μ . Deposit pale yellow.

Habitat on dead twig. Phillips (1991) said that it can found on damp, mossy soils in deciduous woods.

Edibility: Edible (Fig. 7)



Fig. 7. *Cantharellus minor* Pk.

Discussion

Our survey and collection mushrooms and macrofungi at Puncan, Carranglan, Nueva Ecija, Philippines on 5 April 2008 during dry season. We have found about 7 species of mushrooms and macrofungi which they were identified and reported here.

Auricularia fuscossuccinea belongs to Order Tulasnellales or Tremellales (Jelly Fungi) Family Auriculariaceae were found which there are ever reported by Musngi, R.B., Abella, E.A., Lalap, A.L. and Reyes, R.G. (2005) who stated in detail that described the four species of *Auricularia* e.g. *A. auricula*, *A. fuscossuccinea*, *A. polytricha*, *A. tenuis*, which collected in the campus of the Central Luzon State University. Their identification was based on their hyphal zonation and found that from each species, the various strains were identified (i.e. 3 strains for *A. auricula*, 5 strains for *A. fuscossuccinea*, 13 strains for *A. polytricha* and 4 strains for *A. tenuis*). But in our first time study, we identified by observation on morphological characteristic and compared to the literature. Moreover, Musngi, R.B., Abella, E.A., Lalap, A.L. and Reyes, R.G. (2005) also studied in detail about host plants associated with *Auricularia* spp and reported

that seven host trees for *Auricularia* which were noted to be associated with *Auricularia* e.g. rain tree (*Samanea saman*), coconut (*Cocos nucifera*), ipil – ipil (*Leucaena leucocephala*), mahogany (*Sweitenia mahogany*), mango (*Mangifera indica*) and rubber tree (*Hevea brasiliensis*). Among these host trees, rain trees supported the highest number of *Auricularia* species identified. But, in our study did not observe and noted about host species associated with *Auricularia* spp that we had just observed that the specimens were grown on dead woods. It was the first time for us to get experience on collection and this problem would be deserved for our experiences in the future.

The 4 species belong to Order Polyporales; Family Polyporaceae which are identified as *Gloeoporus dichrous* (Fr) Bres , *Coltricia perennis* (Fr) Murr, *Trametes versicolor* and *Phellinus pini* (Fr) Ames were found which identified by morphological characteristics and compared with literatures. The 2 species were recorded *Hobenububelia petaloides* (Bull ex Fr) Schulz which belongs to Order Agaricales (Mushroom), Family Tricholomataceae. *Cantharellus minor* Pk belongs to Family Cantharellaceae. However, this was the first experience for us to collect and identified fungi that may be possible mistaken in species identification but we are more confident on the taxon of Order and Family where the characteristics are so clear. We collected very few samples due to dry condition. However, Quimio (1978) also stated that the best place and time to collect mushrooms and macrofungi, especially freshly fungi is during raining season in a very humid place with diffused sunlight, so a forested area is a good and excellent collecting ground. These fungi like to grow on top of dead and decomposed leaves and logs. She had also suggested that the specimens at different stages of development should be collected by digging them up and for those attached on dead logs and woods. So, our survey was also observed as her suggestion during collecting samples and we had followed her way of collection. Further, those found mushrooms and macrofungi could clearly show that they would survive in dry condition as fruiting bodies. It was observed that most specimens were dried.

Conclusion

It is concluded that our survey and collection of mushrooms and macrofungi on 5 April 2008 at Puncan, Carranglan, Nueva Ecija, Philippines. This time is dry season and low humidity. The 7 species were identified as follows:-*Auricularia fuscusuccinea* (Mont). Henn, *Gloeoporus dichrous* (Fr.) Bres, *Coltricia perennis* (Fr.) Murr, *Trametes versicolor* (L.: Fries) Pilt, *Phellinus pini* (Fr.) Ames, *Hobenububelia petaloides* (Bull ex Fr.) Schulz and *Cantharellus minor* Pk.

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