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An Ethnomycological Survey of Macrofungi Utilized by Dumagat Community in Dingalan, Aurora

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Abstract: ***The survey questionnaire and interview method were used to assess the indigenous awareness and attitudes towards macrofungi used by the Dumagat society in Aurora, Philippines. The results of the study show the socio-demographic profiles of the Dumagats, which were limited to age, gender, civil status, educational attainment, occupation and annual income. Moreover, it has also been discovered that Dumagats are aware of and knowledgeable about the mushrooms as they locally call it "oung." These were found during rainy seasons in areas like; rotting trees, dead leaves, and in the soil. These mushrooms are gathered by those who have served as their food and as an additional source of income for others.***
Keywords: macrofungi, dumagats, oung, indigenous knowledge

I. INTRODUCTION

The Philippines is considered to be a nation of cultural diversity. The United Nations Development Program (2010) reports that there are approximately 14-17 million Indigenous People (IP) in 110 ethno-linguistic communities, 33% of these are clustered mainly in Northern Luzon and Mindanao, 33% of these are in some regions in the Visayas, Southern and Western Luzon, Palawan and the Sulu archipelago. Balilia (2013) identified the native population as the ancestors of the residents of a particular region present when individuals of diverse ethnic or cultural origins reach and subsequently become dominated by even more prominent Filipinos who transferred to tribal areas in the twentieth century.

One of the Indigenous People groups in the Philippines is the Dumagats. They are living in provinces of Nueva Ecija, Isabela, Nueva Vizcaya, Camarines Sur, Camarines Norte, Rizal, Bulacan, and Aurora. They are mostly found in the hillside or on the mountains. They are said to be the result of the combination of Austronesian and Melanesian ancestries. They characterize the outstanding Negrito physical traits of dark brown to black color and curly hair. They are also considered to be semi-nomadic as they move from one place to another place in search for better occupancy. Recently, they have learned to live in permanent settlements; for instance, they existed in Dingalan, Aurora, particularly in Barangay Matawe. They lived in single-pole make-shift nipa huts along river banks during summer time and they transfer to studier dwellings on higher grounds during the rainy season.

During the wet season, the mushrooms is one of the most popular foods that Dumagats catches. Wild edible mushrooms are traditionally used as food and medical supplies by many Asian nations. Yongabi et al. (2004) added that they can also provide a source of revenue for families through selling mushrooms on the marketplace. Meantime, the Food and Agriculture Organization (2006) has noted that growing attention has been paid to the use of edible wild fungi globally. There is even a growth in the demand of mushrooms in the Philippines. In several studies (Dulay et al., 2015, Bustillos et al., 2014, Eguchi et al., 2014) it has been confirmed that there are medical benefits that can be obtained by eating mushrooms.

Preservation of mushrooms by drying, dating back several years, is based on the techniques of sun drying. Mushrooms are highly seasonal in nature, with an incredibly limited life span as they possess humidity in the range of 87 to 95 per cent of the wet base. The glycemic index of this tropical fungus is 32.3 per cent and the basic fiber content is approximately 41 per cent (Milovanovic 2003). Therefore, their production in the manner of a more sustainable product is necessary. Mushrooms can be handled in several ways to prolong their shelf life, such as drying. Drying decreases bulk size, making shipping, handling and storage simpler. While sundrying is inexpensive, mechanically processing rates up the system, avoids errors, guarantees better drying conditions and yields better product relative to sun drying. Hydrolyzed mushrooms are used as an essential ingredient in a range of food combinations, including instant soups, pasta salads, snack seasonings, seasoning, soups as well as poultry and rice recipes (Nachiket et al., 2007).

Fungal species have also been used as food by native groups in Mexico (Garibay-Orijel et al., 2006, Montoya et. al., 2004), Malaysia (Christensen & Larsen, 2005).

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The use of macrofungi as a food source and medicinal is recognized in all indigenous cultures. The various native tribes are also conscious about the use of different species of mushroom. For example, the Aeta societies in Pampanga, Tarlac and Zambales, Philippines are documented to gather and use mushrooms for a variety of purposes (De Leon et al. 2012). Awareness is innate in indigenous communities and is transmitted through oral contact by their great ancestors (Balangcod & Balangcod, 2009). Nevertheless, the knowledge and data on these mushrooms is both minimal and bad. No information is known about their use by native inhabitants and how they truly benefit from these types of mushrooms.

Mushrooms play an important role in the wildlife. Being a saprophyte, they serve as a decomposer in the environment. They are also used as table food and animal feeds. Other species of mushrooms are now being used as alternative medicines. Furthermore, they are also utilized as bioremediations agent in biopesticides. Spent mushroom substrates are also used as agricultural fertilizers. Hence, the current study focused on the socio-demographic profile of Dumagats and their knowledge and attitude towards mushrooms and it aimed to investigate on the use of mushrooms being utilized by Dumagats through a survey/interview.

This study dealt with the ethnomycological survey among Dumagats in Barangay Matawe, Dingalan, Aurora. Specifically, it sought to answer the following questions.

1) How may the socio-demographic profile of Dumagats be described in terms of;
a) age
b) sex
c) civil status
d) educational attainment
e) occupation / annual income?
2) How may the level of knowledge of Dumagats about mushrooms be described in terms of;
a) local/common name
b) location and period of existence
c) cultivation and utilization?
3) How may the attitude of Dumagats towards mushrooms be described?

II. METHODS

The researchers used a descriptive research model to generate a detailed analysis. This type of research design defines the current conditions and other related details of the topic under review. By definition, Salaria (2012) defined the descriptive method as an analytical process of collecting, evaluating, classifying and tabulating data on prevailing circumstances, behaviors, attitudes, procedures, patterns, and then providing an appropriate and accurate analysis of the data collected. This study used the survey / interview questionnaire to collect data.

The research was administered at Barangay Matawe, Dingalan, Aurora. This study site was focused on the presence and accessibility of the Dumagats community in the area. The respondents are the Dumagats, one of the indigenous groups in the Philippines. Of the 67 households in that location, 30 were surveyed and asked to answer the respective questions. In deciding who would be asked, the analysis used a basic random sampling methodology based on the availability of the respondents.

The study used the survey questionnaire adopted from De Leon et al. (2012) with minor modifications to accommodate the sample. The questionnaire was written in Filipino because the respondents were fluent in the language, apart from their native dialect. It consists of two parts: Part I – Socio-demographic profile, and Part II – Awareness and Attitude of Dumagats towards Mushrooms. The questionnaire was intended to generate information on the ethnomycological survey on the current awareness and attitude of Dumagats towards mushrooms and the importance of macrofungal in the aspects of their lives.

Before the research was performed, a letter was sent to the tribal head of the study site requesting permission in their jurisdiction. The tribal chief and the elders in each of the Dumagat groups were then consulted on the conduct of survey questionnaires and interviews. As the letter or permit was accepted, it was a signal to start the report. Real interviews with respondents were performed to collect additional information.

The survey was conducted through structured interviews with respondents from the said group.

Data on socio-demographic characteristics was compiled and tabulated to provide basic information on the Dumagat population. Similarly, the level of knowledge and attitude of the Dumagats towards the mushroom was interpreted and evaluated in terms of the local / common name of the mushrooms, the place and time of life, and the cultivation and utilization of the mushrooms.

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III. RESULTS AND DISCUSSION

The respondents' personal information or backgrounds which were limited into age, gender, civil status, education attainment, occupation and annual income were interpreted in this study and the following results were obtained.

A. Age

The results gathered from the respondents' age distribution showed that 13.33% of the respondents were aged 15-19 years and 35-39 years, 6.67% of them came from both age range 20-24 years and 30-34 years, 20% aged 25 to 29, 16.67% of them were aged between 40 and 44 years, 10% of them were aged 45-49 years and 55-59 years, and 3.33% came from the respondents aged between 50 and 54. The statistical data shows that the majority of the respondents of the study were aged 25 – 29 years. This implies that Dumagats are already familiar and aware with mushrooms during their adulthood stage.

Table 1. Socio-Demographic Profile of the Respondents

Socio-demographic profile	Frequency (N=30)	Percentage
Age		
15 – 19	4	13.33
20 – 24	2	6.67
25 – 29	6	20
30 – 34	2	6.67
35 – 39	4	13.33
40 – 44	5	16.67
45 – 49	3	10
50 – 54	1	3.33
55 – 59	3	10
Gender		
Male	12	40
Female	18	60
Civil Status		
Married	22	73.33
Single	8	26.67
Educational Attainment		
Elementary Graduate	16	53.33
High School Graduate	4	13.33
TVET Graduate	10	33.33
Occupation		
Fishing	10	33.33
Housewife	17	56.67
Midwife	1	3.33
Student	2	6.67
Annual Income		
11,000 – 15,000	1	3.33
16,000 – 20,000	9	30
21,000 – 25,000	1	3.33
No Annual Income (Housewife/Student)	19	63.33

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B. Sex

Based on the presented data that were met by the researchers, it was found out that 60% of the respondents were females while 40% were males. As reflected in the humanity, it is expected that males are the one who provide the needs of the family that make them serve as the head of the family. It is the tradition of the Dumagats those male searches for food in the forest early in the morning until they find food. They brought with them all the materials for hunting and if they caught any wild animals, they sell it to their village. Most women typically stay at home and wait for their spouses from the forest to arrive. They are tasked to take care of their families.

C. Civil Status

The sample consisted of single and married Dumagats. Descriptive indicators showed that 73.33% of the respondents were married, while 26.67% were single. The study shows that majority of the respondents are single.

D. Educational Attainment

Majority of the respondents were elementary graduates (53.33%), while 33.33% of them finished Technical-Vocational Education and Training, 13.33% were high school graduates. This implies that most of the Dumagats do not pursue their studies because it is mirrored in their tradition that at their young age, they must learn how to help their families by means of hunting and searching for food in the forest. Thus, they do not have the opportunities to go to schooling. This situation is comparable to Aeta communities in Central Luzon and most of the indigenous communities in the Philippines. Indigenous people reached elementary and high school level due to poverty (De Leon et al. 2012, NCIP 2009).

E. Occupation

Most of the respondents were housewife (56.67%) since during the conduct of the interview/survey, wives were the one who are available in their respective places for their husband are busy with their works. 10% of them work as fishermen, 6.67% were still studying and one of the respondents serves as midwife.

F. Annual Income

In line of the said occupation, utmost of the respondents (63.33%) do not have yearly revenue due to the fact that they are not working. Meanwhile, 30% of them have 16,000-20,000 annual income; while one of them earned 11,000-15,000 per annum and the remaining 3.33% grossed 21,000-25,000 every year. This income is considered as below the poverty line based on Family Income and Expenditure Survey (2012). The National Statistics Office (NSO, 2012) reported that the annual income of an ordinary family is about P200,000 for them to have a decent living.

G. Indigenous Knowledge on Mushrooms and their Utilization

All of the Dumagat respondents knew about mushrooms (Table 2) and locally called them "kabute" and "uong." De Leon et al. (2012) stated that the Aeta communities generally referred to mushroom as "kuwat." Moreover, the generic term of all fungi in Igala, Nigeria is 'oru' (Ayodele et al. 2011) and in India, 'tit' (Das et al. 2014). In most cases, De Leon et al. (2012) & Ayodele et al. (2011) claimed that the names given to mushrooms are mostly related to the features of the mushrooms and the substrates on which they are found. They figured the mushrooms would appear when it rained. This finding was followed by Reyes et al. (2003), in which mushrooms might grow at any time of year in the Philippines as long as they are present or growing in moist areas. Tayamen et al. (2004) observed that some species had developed only after a drastic fall. Some have believed that mushrooms often occur during lightning and thunder. They also mentioned the growing of mushrooms in the soil, the dried leaves of plants and the rotting logs. In addition, mushrooms often grow in dead or decaying plants or animal residues (Ram et al., 2010).

Dumagats typically gather mushrooms mainly for food. De Leon et al . (2012) identified the method of preparation for cooking mushrooms with other communities in the Philippines, where they cook edible mushrooms by boiling or stirring with meat, provoking fish sauce and vegetables. Mushrooms are used to prepare soup in which the mushrooms are cut into small pieces and the water is separated by adding pressure to the Khasi tribe of India. The mushrooms are then fried with salt and butter, black pepper, chilli and a mild garlic paste. When half cooked, hot water was added and boiled for a few minutes before the mixture became thick. In addition, many Indian tribes cook mushrooms with bamboo shoots and red hot chilli (Khaund & Joshi 2013). Mushrooms are eaten as fresh veggies in Jammu and Kashmir (India). They are normally cooked with tomatoes and onions, while others are dried and eaten during the winter months during which the supply of vegetables is scarce (Kuhmar & Sharma 2011).

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Table 2. Knowledge of Dumagats on Mushrooms

Knowledge on Mushrooms	Frequency (N=30)	Percentage
Awareness / Knowledgeable		
Yes	30	100
No	0	
Depiction on mushrooms		
As food	30	100
As medicine	2	6.67
As poison	4	13.33
Local/common name		
Kabute / Uong	30	73.33
Mushrooms found in the forest		
Kabuteng Saging	30	100
Kawayan	30	100
Kalaw	30	100
Punso		
Period/Time of Existence		
When it rains	30	100
When there is lightning and thunder	30	100
Place/location of Occurrence		
Decaying Logs	30	100
Leaf Litter	5	16.67
Soil	10	33.33
Benefits / Utilization		
As food	30	100
As medicine	2	6.67
As additional source of income	2	6.67

H. Indigenous Attitude on Mushrooms

Some of the Dumagats exploit mushroom for therapeutic tenacities. They supposed that mushrooms can treat numerous diseases such as cough and cold, arthritis, stomachache and headacheSeveral studies have shown that mushrooms are used to treat skin diseases (Aryal & Budathoki 2013, Yongabi et al., 2004), yellow fever, constipation, mumps, measles, and ear pain, cut wounds, muscle pain and stomach pain (Aryal & Budathoki 2012). Others, pick the mushrooms to market them as their additional funds.

Table 3. Dumagats' Attitude towards Mushrooms

Attitude towards Mushrooms	Frequency (N=30)	Percentage
Practices of Dumagats		
Collect and take home (edible)	30	100
Collect and sell	2	6.67
Collect and destroy	0	

The table below describes the views of the Dumagat group on mushrooms in Brgy. Matawe, Dingalan, Aurora, guy. Both of the respondents had gathered edible mushrooms as they served as food for them. The uncommon mushrooms were not harvested because they were scared that they could be toxic when eaten. Their practices and attitudes towards the mushrooms were taught by their ancestors.

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IV. CONCLUSION

Based on the results of the study, the following conclusions were drawn;

A. Dumagats' respondents were dominated by females who are housewives of their respective families. Some of them were males who are engaged with fishing as their means of living. Greatest of the Dumagats were elementary graduate as reflected in their tradition and practices. Majority of them belongs to low income group as represented in their yearly revenue. At the stage of adulthood (20-24 years), they are aware and informed about the mushrooms in their locality.

B. Mushrooms are recognized by the Dumagats as they call it "oung". They perceived these mushrooms during the rainy seasons and when there is lightning and thunder. They observed the occurrence of these mushrooms in the places such as decaying logs, dead leaves / leaf litter, and in the soil. They cultivated and utilized them as their source of food, medicine, and additional source of income.

C. The attitude of the Dumagats toward mushroom is positive. They collected them and prepared as their food, while some of them sell it to have supplementary earnings.

V. RECOMMENDATIONS

A. Dumagats should learn the propagation of mushrooms for their additional source of income so as not to depend merely on natural occurrence.

B. There must be information dissemination, isolation and domestication of known edible mushrooms which are known by the Dumagats are also recommended.

C. Supplementary study must be done to identify (authentication) the present species of mushrooms in the said province. It is also suggested to determine not only the taxonomy but also the nutrient contents of the mushrooms. Further research should be conducted for verification and support for this current study.

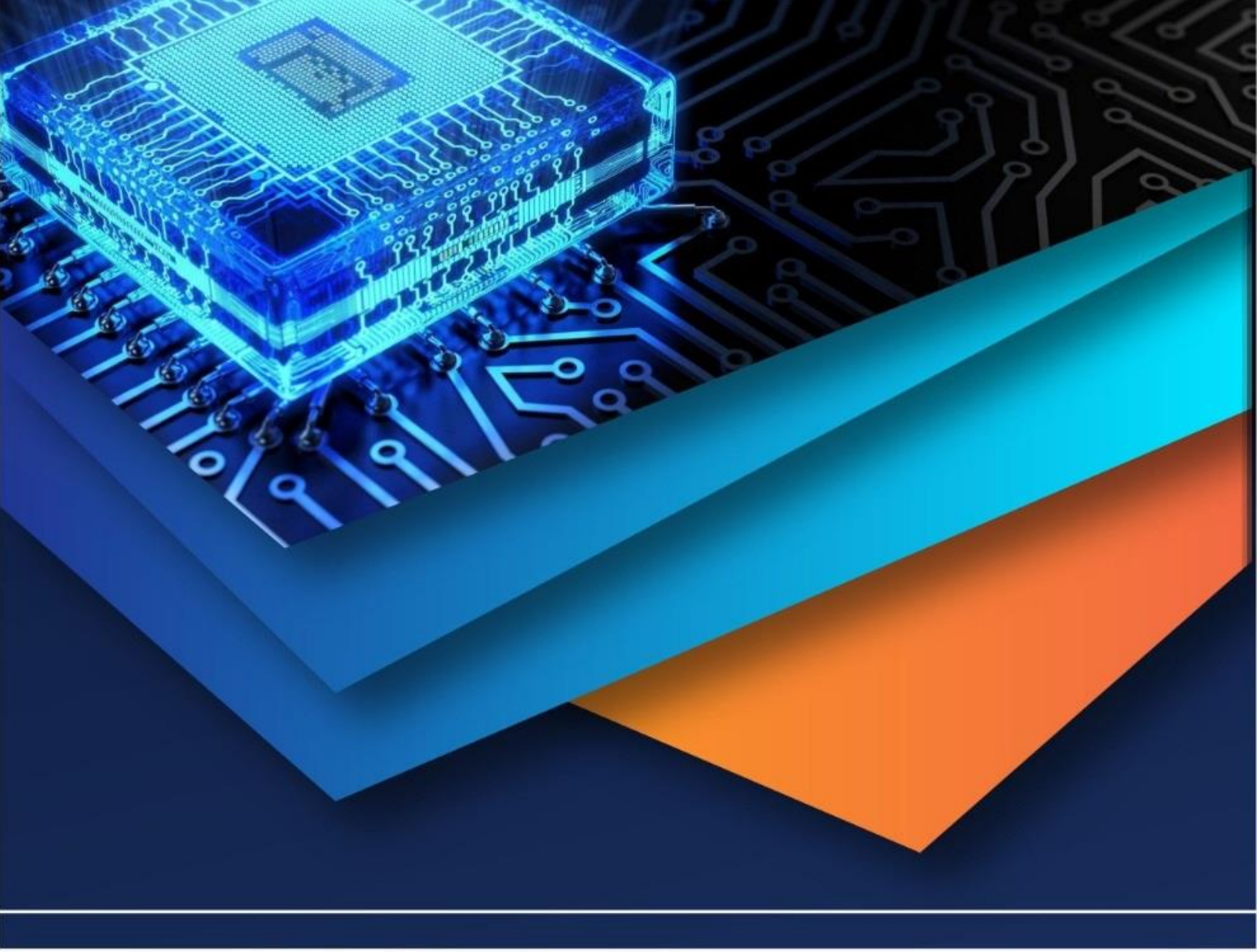
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