



FOOD RESEARCH INSTITUTE

**REPORT OF MUSHROOM DIVERSITY IN GHANA: CASE STUDY IN THE VOLTA
AND EASTERN REGIONS**

By

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INTRODUCTION

Many forests in the tropics and sub-tropics are endowed with abundant genetic resources of edible and medicinal mushrooms. Most of these mushrooms remain unidentified, underutilized and understudied. For centuries now, mushrooms have not only been used as foods and therapeutics in folk medicine but in the present-day has found clinical uses. There is a growing interest in mushrooms on their dietetic, pharmacological, production of secondary metabolites and their bioactive properties. They have attracted much interest as functional foods because of properties they exhibit such as being anti-tumoral and anti-viral among others. Statistics in Ghana show that the country's total forest cover which stood at 8.2 million hectares at the turn of the 20th century has decreased to about 1.6 million hectares and it is estimated that its forest resource in the next 23 years will be totally lost if correct measures are not put in place. In view of this alarming situation in terms of the rate of desertification, the rationale for the project is to characterize the mushroom germplasm in some forests in Ghana with the view of conserving these mushrooms under threat some of which will serve as raw materials for the nutraceutical and functional food industries. Also, the project will create jobs for the youth and the unemployed in the communities surrounding these forests by engaging them in mushroom farming using agricultural residues, thus ensuring both food and income security.

OBJECTIVES

- To document indigenous knowledge of edible and medicinal mushrooms in four regions of Ghana
- To characterize by phenotypic methods mushrooms collected from four forests in these regions
- To determine the biochemical composition of these mushrooms in order to ascertain their biochemical components
- To cultivate five selected cultivable species on agricultural residues using the Juncao technology and Plastic bag methods
- To transfer technology to 100 youths in the communities

MYCOLOGICAL COLLECTION OF MACROFUNGI IN FORESTS

As part of the objectives and schedule for year one of the research title “Characterization, conservation and Domestication of indigenous Edible and Medicinal Mushrooms on agricultural residues” (CDEMM) under Africa–Brazil Agricultural Innovation Marketplace, a team comprising of Drs Arailde Urben Fontes, Edison de Souza and Vinicius Figueirêdo (Brazil) and Dr Mary Obodai, Miss Matilda Dzomeku, and Mr Richard Takli (Ghana) set out on a mycological trip to four forests in the Eastern and Volta regions. The four forests were Atewa Forest Reserve and Apapem Forest in the Eastern Region, Gbedi Gborgame Afadzato Range and Wli Agumatsa Waterfalls of the Volta region. These trips were carried out from 17th-18th and 21st-22nd May. Below are some descriptions of the mushrooms found in them.

ATEWA RANGE FOREST RESERVE

The Atewa Range Forest Reserve (Atewa) was established as a national forest reserve in 1926 and has since been designated as a Globally Significant Biodiversity Area (GSBA) and an Important Bird Area (IBA) (Abu-Juam *et al.*, 2003). Scientific data on diversity and status of species of birds, primates, mammals, and insects within Atewa have been collected with little or no data on fungi during the seasonal changes in the country. Meanwhile, fungi provide key ecosystem services such as recycling of nutrients but have been totally overlooked by all mainstream conservation movements.

A total of 18 mushroom species were collected, with 9 belonging to the Class Agaricomycetes, two to the Class Basidiomycetes and one each of Ascomycetes and Tremellomycetes. Fifteen samples were identified and of these six are edible mushrooms belonging to six genera. Of these, two species were the first recorded in Ghana namely *Tremella mesenterica* and *Favolus brasiliensis*. A new medicinal mushrooms *Pycnoporus sanguineus* was also recorded. Most of the species belonged to the order polyporales (2), agaricales (5), auriculariales (2) and one each of the order tremellales, pezizales, russulales. Below are some of the mushrooms found in the forest (Figs 1-12)



Fig 1: *Termitomyces striatus*



Fig 2: *Pleurotus tuber regium*



Fig 3: *Amauroderma* sp. (Pat) Murr



Fig 4: *Tremella mesenterica*



Fig 5: *Lepiota* spp.



Fig 6: *Russula* spp.



Fig 7: *Cookeina speciosa*



Fig 8: *Volvariella volvacea*



Fig 9: Unknown



Fig 10: *Oudemansiella sp.* Synonym
Collybia



Fig 11: *Auricularia polytricha*



Fig 12: *Pycnosporus sanguinesis*

APAPEM FOREST

A total of 9 mushroom species were collected from the forest these belonged to the Class Agaricomycetes and Basidiomycetes. The species belonged to the order polyporales (2) and agaricales (7). The identified species are *Volvariella volvacea*, *Termitomyces striatus*, *Schizophyllum commune*, *Ganoderma* sp, *Macrolepiota* sp, *Mycena* sp., *Oudemansiella canarii*, *Trametes* sp (Figs 13-18) .

GBLEDI GBOGAME (AFADZATO FOREST RESERVE)

Fifteen fungal species were collected, with 3 belonging to the class Basidiomycetes, eight as Agaricomycetes, one each in Class Ascomycota and Sordariomycetes respectively. There were two *Trametes* sp. and two unknown species of which one was recognized as edible and eaten locally. Five mushrooms were identified as edible. Most of the species belonged to the order polyporales (3), agaricales (7) xylariales (1) among others. Some of the mushroom species collected are listed below (Figs 19-24).

Wli Agumatsa Waterfalls

A total of eighteen species of mushrooms were collected of which fifteen species were identified. Thirteen belonging to the class Agaricomycetes, three in class Basidiomycetes and two in class Heterobasidiomycetes and one in class Sordariomycetes. Of the edible mushrooms, two new species namely *P. sajor caju* and *P. albidus* were recorded for the first time in Ghana. Most of the species belonged to the order polyporales (7), agaricales (8) xylariales (1) and auriculariales (2). Some of the mushroom species collected are listed below (Figs 19-24).



Fig 13: *Trametes sp*



Fig 14: *Schizophyllum commune*



Fig 15: *Oudemansiella canarii*



Fig 16: Locally known as *Mewedee* and its edible



Fig 17: *Mycena sp.*



Fig 18: *Macrolepiota sp.*



Fig 19: Unknown



Fig 20: Unknown



Fig 21: *Psathyrella* sp



Fig 22: *Clitocybe* sp



Fig 23: *Collybia* sp



Fig 24: *Trametes* sp.



Fig 25: *Trametes* sp.



Fig 27: *Bovista* sp.



Fig 29: *Ganoderma* sp.



Fig 26: *Polyporus* sp.



Fig 28: *Daldinea concentrica*



Fig 30: *Trametes* sp.

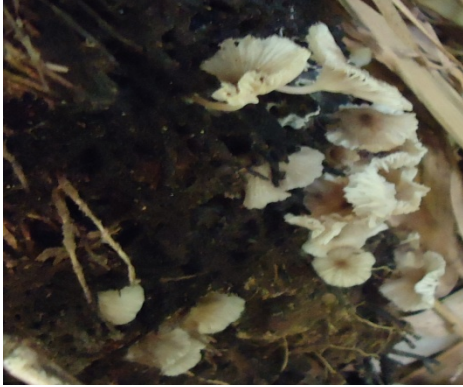


Fig 31: *Favolus brasilensis*



Fig 32: *Daedalea* sp



Fig 33: *Lentinus squarrolus*



Fig 34 Unknown



Fig 35: *Marasimus* sp.



Fig 36: Unknown



Fig 37: *Pleurotus sajor-caju*



Fig 38: Unknown



Fig 39 *Pleurotus albidus*



Fig 40: *Trametes* sp.

Conclusion:

The mycological trip was very successful and educative. A total of 60 macrofungi were collected out of which 51 were identified. New species of mushrooms were recorded for the first time in Ghana, namely *Pleurotus sajor caju*, *P. albidus*, *Tremella mesenterica*, *Oudemansiella canarii*, *Pycnosporus sanguineensis* and *Favolus brasiliensis*. These samples have been dried for further biochemical analysis. A more detailed report of all the described mushroom species is in progress.



Team members at the end of collection at the Atewa Forest Range.