

Cibola 1978

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MYCO-ECOLOGICAL STUDY FOR THE TURKEY CREEK UNIT, BIG THICKET
NATIONAL PRESERVE

With the exception of Cypress and perhaps Water Tupelo, all forest species found in the Big Thicket National Preserve have a complex relationship with fungi which enable them to better be able to obtain nutrients and moisture from the soil. In pines, this is evidenced by their ability to grow in impoverished soils where much other vegetation does not succeed well. For this reason, pines have often been planted in severely eroded areas or in other soils that are not generally good for agricultural crops. Additionally, in natural ecosystems, (e.g. arid sandy lands), some species of oak as well as some pines establish themselves and survive in these hostile environments.

The reason for success in these sites is due to the relationship that has been established between the rootlets of the tree and the fungal mycelium. In its participation in the symbiosis, the fungus will allow the tree to obtain more water through its extensive mycelial system which greatly increases the surface area available for water absorption as compared to the tree's own root system. Additionally, the fungus is capable of giving mineral nutrition by separating tightly bound ions that are present in impoverished soils thus making them available for uptake by the tree's own root system. This water and these minerals are then by the action of photosynthesis and the tree's metabolism converted into the complex organic compounds that the tree needs to live. The tree in return, delivers to the fungus vitamins and other complex metabolites that the fungus cannot manufacture by its own self. In addition to these benefits, it is believed that the mushroom mycelium produces diffusable compounds which migrate into the soil around the tree roots and there these compounds act as a barrier to prevent infection to the roots by other organisms. This relationship between fungus and tree is called mycorrhiza.

In most ecological studies, the importance of mycorrhiza has been ignored. It is evident from the preceeding, that any factor (e.g. some chemical sprays) which adversely affects the fungal symbiont will have a direct adverse affect upon the tree. Furthermore, it is quite possible that this effect could be permanent. What is more surprising, is that very little serious work has been done on the taxonomy of the mycorrhizal fungi in the Southeast. Hence, it is not unexpected that new taxa will be found in this study area. To fully understand the role of mycorrhizal fungi in these ecosystems, it is first necessary that all taxa be known to science.

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During this contract period, collections were made during:

Nov. 18 - 20, 1977

Dec. 2 - 4, 1977

Dec. 16-18, 1977

Feb 17 - 20, 1978

Mar 27 - 29, 1978

Jun 4, 1978 (No fungi found)

Jul 21 - 23, 1978

Additional collections were made as turned in by various individuals during the course of other activities occurring within BITH during the past year. This information is also incorporated into this table.

Fifty-six species were collected and identified. Most were photographed, and the dried collections of each were deposited in various herbaria as shown in Table I.

In addition to these collections, some members of the Houston Mycological Society visited the Big Thicket area during their first annual foray, November 4th and 5th, 1977. These collections made at both Lance Rosier and Turkey Creek are shown in Table II. Dr. Alexander H. Smith, University of Michigan, was the principal mycologist at this foray and made the identifications given herein.

As to be expected in an area which is floristically rich and which has not been intensively studied by mycologists, a number of interesting collections were obtained which may represent as yet unrecorded species.

Cantharellus #780 is most probably an undescribed species and Bovista #716 and 719 are most interesting and unusual puffballs. Their appearance in early autumn in the low, wet deciduous bottomlands just above the cypress/tupelo swamp forest is most peculiar. In addition, several of the species of Cortinarius are probably endemic. These have been turned over to Dr. Alexander H. Smith who is currently monographing the genus. It is especially important to understand the speciation within Cortinarius as this genus is an important mycorrhizal former.

One of the truffles, Elaphomyces, #772 mycorrhizal with beech, and which forms a subterranean sporocarp was encountered along with Cordyceps which parasitizes this fungus.

One of the more interesting fungi encountered, was Hebeloma #739 (vinosophyllum) which fruited abundantly over a shallow depression in the Turkey Creek Unit. In digging this area up several months later, the author encountered a plank (8" X 15") about 6" - 8" beneath the surface. Lifting the plank, a

femur invested with white mycelium and covered with what appeared to be primordia was found. Other bones were imbedded in the soil around the cavity beneath the plank. These were not removed, and no identification was given to the bones. The site was photographed open, and then restored. Several species of Hebeloma have been associated with buried mammalian carcasses (Sagara, 1976) and the importance of this agaric in forensic investigations is obvious.

Very few fungi were found during the spring and early summer. This is in part due to the extreme dry conditions which existed at this time. No doubt these conditions have reduced both the numbers and species which could be observed.

Recommendations:

In the course of this study, only a few species of Boletus and related genera were found. These genera peak in the late summer and early autumn, and also, are important mycorrhizal formers. This season was just beginning when the last field trip, 23 Jul 78 was made. As many are probably endemic, this group is in need of more serious study.

From a study of other areas along the Gulf Coast, it is known that this area has a rich, diverse and mostly undescribed flora of hypogaeus (truffles and false truffles) fungi. These too, are important mycorrhizal formers with both conifers and deciduous trees. One, Elaphomyces, was encountered in this study.

It is recommended that studies continue with these groups which are important mycorrhizally and also appear to have many endemic species.

REFERENCE

Sagara, Naohiko (1976) "Presence of a buried mammalian carcass indicated by fungal fruiting bodies" Nature 262: 816, 1976.



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