

Lignicolous Macromycetes from Giumalău Secular Forest (Eastern Carpathians)

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1. Introduction

The Giumalău Secular Forest is situated on the north-western slope of the Giumalău Massif, on the Valley of Putna Mare River, at 46° 26' north latitude and 25° 30' east longitude, inside of Moldova Superior Basin. The altitude where the dominant reserve is situated is approximately 1400 m; 1230 m minimum, with u.a. A-119, at the point where Putna Mare River leaving reservation, and maximum 1680 meters, with u.a. 122 B, representing the corner with forest submitted to the gap in Alpine. Both general altitudinal difference which is approximate 450 m on relatively short distances (ranging between 0,8-1,2 km), and a local configuration produced a large inclination of the terrain (with slopes ranging from 15-35°).

Giumalău Secular Forest is a spruce forest (*Picea abies* (L.) Karst) located in the sub-zone of this specie. It is situated on the edge between forest area and the alpine forest. This forest is composed by pure spruce up in close proximity to alpine gap. The brushes have huge and compact corona, a special characteristics which do not allow than a weak lighting of soil. This aspect generated a lower representation of both elements brushes and herbaceous [4].

Dead wood maintain forest productivity by providing organic matter, moisture, nutrients and areas of regeneration for conifers. It is well known that seeds of some tree species germinate especially on fallen logs which are in the process of decay.

2. Materials and methods of researche

To identify lignicolous macromycetes, there were investigated trunks and branches fallen down the ground, living trees and stumps. Sporiferous bodies were been collected with a knife and transported in paper-bags for a later identification in laboratory. To determine the species was used catalogues and special literature [1, 2, 5, 6]. For quantitative analysis of lignicolous macromycetes from Giumalău Secular Forest was registered following items: abundance of sporiferous bodies, frequency and constancy of species into the investigated areas [3].

3. Results

Observations concerning to lignicolous mycobiota were developed during 3 successive years (2005-2007), and we identified 43 species of macromycetes.

Most species have been identified in autumn season, because, during this period was been a surplus of precipitations which have hydrated debris wooden fallen down and encouraging development of macromycetes which forming sporiferous fleshy bodies. In the vernal and summer seasons were identified especially species which have wooden sporiferous bodies.

Conspect of lignicolous macromycete species which were been identified in investigated areas

Amylostereum areolatum (Chaillet) Boidin – lignicolous saprophyte, oligophagous, on spruce wood (14.07.2007);

Armillaria ostoyae (Romagn.) Herink – lignicolous saproparasite, polyphagous, on spruce wood (2.09.2006) and birch wood (8.09.2007);

Calocera cornea (Batsch) Fr. – lignicolous saprophyte, oligophagous, on beech wood (15.08.2008);

Calocera viscosa (Pers.) Fr. – lignicolous saprophyte, oligophagous, on spruce wood (14.07.2007) (**Photo 1**);

Chlorociboria aeruginascens (Nyl.) Kanouse ex C.S. Ramamurthi, Korf & L.R. Batra – lignicolous saprophyte, oligophagous, on birch wood (14.07.2007);

Clitocybula lacerata (Lasch) Singer – lignicolous saprophyte, oligophagous, on spruce wood (14.07.2007);

Crucibulum laeve (Huds.) Kambly – lignicolous saprophyte, oligophagous, on beech wood (4.08.2006);

Dacrymyces stillatus Nees – lignicolous saprophyte, oligophagous, on spruce wood (24.08.2005);

Fomitopsis pinicola (Sw.) P. Karst. – lignicolous saproparasite, polyphagous, on spruce wood (14.07.2006) and birch wood (8.09.2007) (**Photo 2**);

Ganoderma applanatum (Pers.) Pat. – lignicolous saproparasite, polyphagous, on spruce wood (2.09.2006) and birch wood (16.05.2007) (**Photo 3**);

Gloeophyllum abietinum (Bull.) P. Karst. – lignicolous saprophyte, oligophagous, on spruce wood (26.08.2007) (**Photo 4**);

Gloeophyllum odoratum (Wulfen) Imazeki – lignicolous saprophyte, oligophagous, on spruce wood (3.10.2005) (**Photo 5**);

Gloeophyllum sepiarium (Wulfen) P. Karst. – lignicolous saprophyte, oligophagous, on spruce wood (26.08.2007) (**Photo 6**);

Gymnopilus penetrans (Fr.) Murrill – lignicolous saprophyte, oligophagous, on spruce wood (2.09.2006);

Hericium alpestre Pers. – lignicolous saproparasite, oligophagous, on spruce wood (26.08.2007) (**Photo 7**);

- Heterobasidion annosum* (Fr.) Bref. – lignicolous saproparasite, oligophagous, on spruce wood (2.09.2006);
- Hydnellum geogenium* (Fr.) Banker – lignicolous saprophyte, oligophagous, on spruce wood (24.08.2005);
- Hygrophoropsis aurantiaca* (Wulfen) Maire – lignicolous saprophyte, oligophagous, on spruce wood (3.09.2005);
- Hypholoma capnoides* (Fr.) P. Kumm. – lignicolous saprophyte, oligophagous, on spruce wood (4.08.2006);
- Hypholoma fasciculare* (Huds.) P. Kumm. – lignicolous saprophyte, polyphagous, on spruce wood (2.09.2006) and birch wood (4.08.2006);
- Merulius tremellosus* Schrad. – lignicolous saprophyte, polyphagous, on spruce wood (2.09.2006) and alder wood (11.10.2006);
- Micromphale foetidum* (Sowerby) Singer – lignicolous saprophyte, polyphagous, on spruce wood (2.09.2006) and birch wood (14.07.2007);
- Mycena epipterygia* (Scop.) Gray – lignicolous saprophyte, oligophagous, on spruce wood (4.08.2006);
- Mycena silvae-nigrae* Maas Geest. & Schwöbel – lignicolous saprophyte, oligophagous, on spruce wood (4.08.2006);
- Pholiota adiposa* (Batsch) P. Kumm. – lignicolous saproparasite, oligophagous, on birch wood (2.09.2006);
- Pholiota astragalina* (Fr.) Singer – lignicolous saprophyte, oligophagous, on spruce wood (2.09.2006);
- Piptoporus betulinus* (Bull.) P. Karst. – lignicolous saproparasite, monophagous, on birch wood (9.06.2007);
- Pleurotus dryinus* (Pers.) P. Kumm. – lignicolous parasite, polyphagous, on spruce wood (2.09.2006) and birch wood (4.08.2006);
- Pseudohydnum gelatinosum* (Scop.) P. Karst. – lignicolous saprophyte, oligophagous, on spruce wood (24.09.2006);
- Scutellinia scutellata* (L.) Lambotte – lignicolous saprophyte, polyphagous, on spruce wood (2.09.2006) and birch wood (14.07.2007);
- Sparassis crispa* (Wulfen) Fr. – lignicolous parasite, oligophagous, on spruce wood (2.09.2006);
- Spongipellis borealis* (Fr.) Pat. – lignicolous saproparasite, monophagous, on spruce wood (15.08.2008);
- Stereum gausapatum* (Fr.) Fr. – lignicolous saproparasite, monophagous, on birch wood (3.09.2005);
- Stereum hirsutum* (Willd.) Pers. – lignicolous saproparasite, monophagous, on alder wood (9.06.2007);
- Tapinella atrotomentosa* (Batsch) Šutara – lignicolous saprophyte, oligophagous, on spruce wood (3.09.2005);
- Trametes hirsuta* (Wulfen) Pilát – lignicolous saprophyte, oligophagous, on birch wood (15.08.2008);
- Tremella encephala* Willd. – lignicolous saprophyte, oligophagous, on spruce wood (26.08.2007);

Tremella foliacea Pers. – lignicolous saprophyte, polyphagous, on spruce wood (7.09.2007) and birch wood (14.07.2007);

Trichaptum abietinum (Dicks.) Ryvarden – lignicolous saprophyte, oligophagous, on spruce wood (3.10.2005) (**Photo 8**);

Tricholomopsis decora (Fr.) Singer – lignicolous saprophyte, oligophagous, on spruce wood (26.08.2007);

Tricholomopsis rutilans (Schaeff.) Singer – lignicolous saprophyte, oligophagous, on fir wood (7.09.2007);

Tubaria furfuracea (Pers.) Gillet – lignicolous saprophyte, oligophagous, on birch wood (4.05.2008);

Xeromphalina campanella (Batsch) Maire – lignicolous saprophyte, oligophagous, on spruce wood (26.08.2007).

Most of registered species (34) were identified on the rotten spruce wood. These species belong to the following genera: *Armillaria*, *Calocera*, *Clitocybula*, *Dacrymyces*, *Fomitopsis*, *Ganoderma*, *Gloeophyllum*, *Gymnopyllus*, *Hericium*, *Heterobasidion*, *Hydnellum*, *Hygrophoropsis*, *Hypholoma*, *Merulius*, *Micromphale*, *Mycena*, *Pholiota*, *Pseudohydnum*, *Scutellinia*, *Sparassis*, *Spongipellis*, *Tapinella*, *Tremella*, *Trichaptum*, *Tricholomopsis* and *Xeromphalina*.

On wood of some trees (birch, beech, alder, sycamore) were been identified 18 species. Nine of these species were founded only on this type of wood: *Calocera cornea*, *Chlorociboria aeruginascens*, *Crucibulum laeve*, *Pholiota adiposa*, *Piptoporus betulinus*, *Stereum gausapatum*, *Stereum hirsutum*, *Trametes hirsuta* and *Tubaria furfuracea* (**Figure 1**).

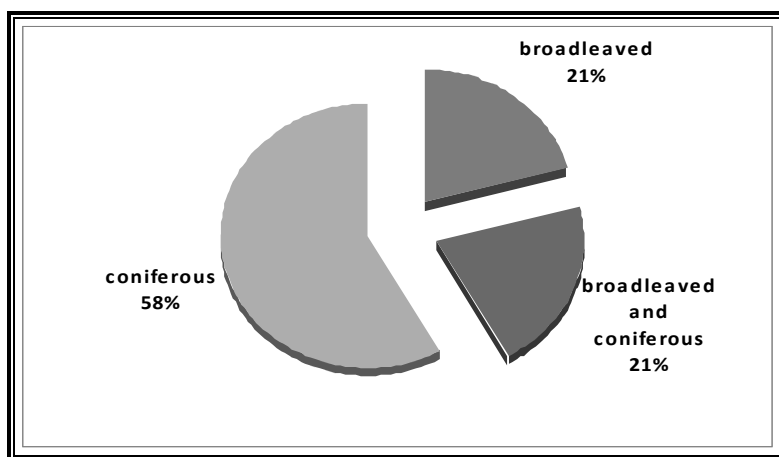


Figure 1: Distribution of some macromycete species depending on the wood essence

In terms of affinity for a special kind of wood species, it was observed that most of taxons (33) are oligophagous and 9 of them are polyphagous. From the monophagous category, it was identified only one specie (*Piptoporus betulinus*) (**Figure 2**).

Quantitative analysis of sporiferous bodies has evidenced a high abundance of the following species: *Armillaria ostoyae*, *Gleoeophyllum odoratum*, *Hypholoma capnoides*, *Trichaptum abietinum* and *Xeromphalina campanella*. From constance point of view, we identified especially some species that forming woody sporiferous bodies (*Fomitopsis pinicola*, *Gleoeophyllum odoratum*, *Gleoeophyllum sepiarum* and *Trichaptum abietinum*). In the autumn season has noted an increased frequency of lignicolous species which forming sporiferous fleshy bodies (*Armillaria ostoyae*, *Clitocybula lacerata*, *Hypholoma capnoides* and *Mycena epypterygia*).

Ecological analysis evidenced the dominance of saprophytic species followed by saproparasites. From parasites species, there were identified *Pleurotus dryinus* and *Sparassis crispa* (Figure 3).

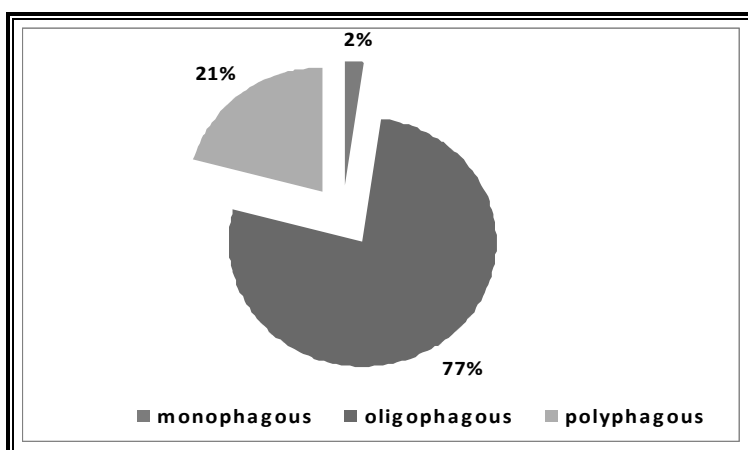


Figure 2: Distribution of some macromycete species depending on its affinity for a host-plant

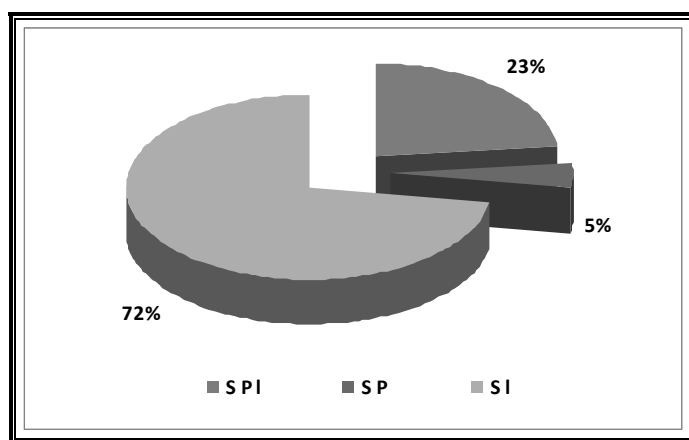


Figure 3: Ecological spectrum of macromycetes species

During our investigations, we observed a direct proportional correlation between thickness and size of fallen trunks and sporiferous bodies. Also, we noticed that the wood which is in a more advanced degradation stage has a larger number of sporiferous fungi that colonized it (*Armillaria ostoyae*, *Hypholoma capnoides*, *Tricholomopsis decorata* and *Xeromphalina campanella*).

4.Conclusions

Lignicolous macromycetes from Giumalău Secular Forest are predominant oligophagous species which decomposing especially conifers, spruce and fir woods.

Identified species belonging to 34 genera, most of them are represented only by a specie.

Lignicolous mycobiota from Giumalău Secular Forest is represented mainly by common species which are characteristic of coniferous forests, but there were been identified few rare species (*Hericium alpestre* and *Tremella encephala*) [7].

From the point of view of occurrence season for sporiferous bodies, we registered a maxim in autumn especially for species with fleshy sporiferous bodies.

The Giumalău Secular Forest has a special importance for lignicolous macromycetes conservation based on its status of protected area which does not allow extraction of fallen wood.

References

- BORGARINO D., HURTADO Cr., 2001. *Champignons de Provence, Haute-Provence et Midi Méditerranéen*, Édisud, Aix-en-Provence: p.1–440
- BREITENBACH J., KRÄNZLIN F., 1986. *Champignons de Suisse. Champignons sans lames*, Ed. Mykologia, Lucerne, 2: 412 pp.
- CRISTEA V., GAFTA D., PEDROTTI F., 2004. *Fitosociologie*, Ed. Presa Universităţii Clujene: 394 pp.
- LESENCIUC C.D., 2004, *Studiu geomorfologic al Masivului Giumalău*. Teză de doctorat. Facultatea de Geografie şi Geologie, Iaşi: 1–296
- ROUX P., 2006, *Mille et un champignons*, Ed. Roux, Sainte-Sigolène France: 1223 pp.
- SĂLĂGEANU GH., SĂLĂGEANU ANIŞOARA, 1985. Determinator pentru recunoaşterea ciupercilor comestibile, necomestibile şi otrăvitoare din România, Ed. Ceres, Bucureşti: 310 pp.
- TĂNASE C., POP Adriana, 2005 – Red List of Romanian Macrofungi Species, Bioplatform – Romanian National Platform for Biodiversity, Editura Academiei Române (ISBN 973–27–1211–2), Bucureşti: 101–107

Abstract

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Keywords: secular forest, macromycetes, dead wood.

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Foto 1: *Calocera viscosa* (Pers.) Fr.



Foto 2: *Fomitopsis pinicola* (Sw.) P. Karst.



Foto 3: *Ganoderma applanatum* (Pers.)
Pat.

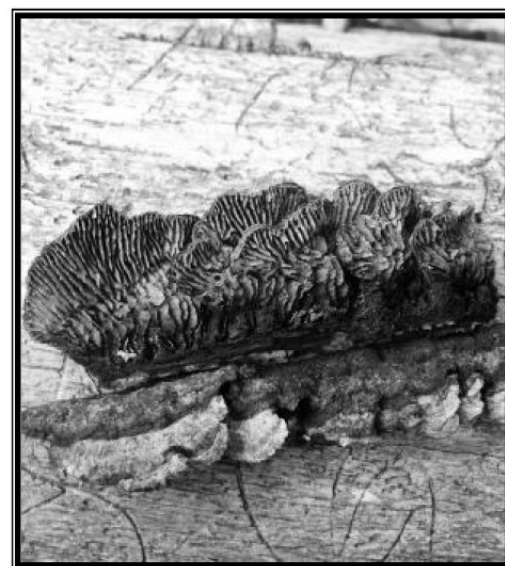


Foto 4: *Gloeophyllum abietinum* (Bull.) P.
Karst.



Foto 5: *Gloeophyllum odoratum* (Wulfen)
Imazeki



Foto 6: *Gloeophyllum sepiarium* (Wulfen)
P. Karst.



Foto 7: *Hericium alpestre* Pers.



Foto 8: *Trichaptum abietinum* (Dicks.)
Ryvarden