

## New and noteworthy discomycetous fungi on coniferous hosts from Switzerland.

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With one text-figure.

During a visit to Graubünden in Switzerland in June 1954 some interesting discomycetous fungi were found on conifers.

The first is a brown-exciple *Dasyscypha* species occurring on branches of *Pinus montana* Mill.; the second one is a new species of the genus *Durandiella* Seaver, also inhabiting *P. montana* for which the name *Durandiella helvetica* Gremmen n. sp. is proposed. The third fungus is a very characteristic saprophytic organism living on twigs of *Picea Abies* (L.) Karst., on which much confusion seems to exist concerning spore-measurements and hostplants.

1. *Dasyscypha fuscanguinea* Rehm, Ber. Nat. Ver. Augsb. **26**: 30. 1881 non *Lachnella pini* Brunch., Bergens Mus. Aarsbog **8**: 8—11, 1892.

In the alps around Arosa (Graubünden) near Maran, at an altitude of 1800—2000 meters, many trees of *Pinus montana* were observed, showing dead branches, on which numerous apothecia of the fungus had developed. An attack by this Discomycete was strongly suggested, but was not evidenced. Apothecia also were sampled on young *P. montana*, which had been heavily infested by a „snow-fungus“, probably *Herpotrichia nigra*, during last winter, but this could not be confirmed with certainty.

Description of the fungus (Gremmen 748).

Apothecia about 2 mm in diameter, growing in groups and shortly stipitate, about 0.5 mm. The hymenium is orange-red coloured and is surrounded by lightbrown hairs. The asci measure  $87-91 \Rightarrow 10.5 \mu$  and the porus is J—. The ascospores are  $(12)-13.3-15.2-(16.1) \Rightarrow 4.7-5.7 \mu$ , one-celled, one-seriate, colourless, ellipsoid or piriform. The paraphyses are filiform,  $2.0 \mu$  in thickness, the apex about  $3 \mu$  and are filled with orange-yellow globular corpuscles. The hairs are brown, rough and septate, measuring about  $136 \Rightarrow 4 \mu$ .

On branches of *Pinus montana* Mill., Maran, June 3, 1954.

This material was compared with a collection obtained from Dr. I. Jørstad, that was found in Fyresdal in Telemark, Norway 23. IX. 1927, on *P. sylvestris*, leg. I. Jørstad. This specimen of *D. fuscanguinea* has longer ascospores, ranging from  $15.2-19.0 \Rightarrow 4.7-5.7 \mu$ ,

but further was identical macroscopically. The same was true with a specimen of the fungus received from Prof. Dr. V. Kujala. This collection is from Sodankyla Komensis, Finnland, 26. VIII. 1947, on *P. sylvestris*, leg. V. Kujala. Here, too the ascospores were longer. Both norwegian and finnish collections proved to be identical.

Brunchorst (1893) was the first author, who recognized the parasitic nature of a brown-excipled *Dasyscypha* in Norway, where it especially occurred in Finnmark. He described it as *Lachnella pini* n. sp.

According to Lagerberg (1912) *D. fusc sanguinea* is generally spread in the northern part of Sweden, where it is a characteristic element.

Jørstad (1925, p. 42) states that the trunks and also partly the branches are attacked by *D. fusc sanguinea* and subsequently the tops are dying above the place of parasitical invasion. Under certain circumstances, he informs, the fungus may be a saprophyte too.

Afterwards, Kujala (1950) has confirmed this and records (p. 26): „Kangas (1927, pp. 98—99, 146—147) hat den Pilz als wichtigen Schädling der Kiefern kulturen in Nordfinnland gefunden —“ and further (p. 27): „Bei Immeljärvi z. B. hatte der Pilz den noch nicht meter hohen Kiefern nachwuchs arg beschädigt, —“. Kujala terms *D. fusc sanguinea* a real parasite, especially on young plants, whereas on the thicker branches cankers may be formed too, in which the characteristic apothecia are developed.

Hahn & Ayers (1934) in an excellent paper on some brown-excipled *Dasyscyphae*, demonstrate that there are some differences between the alpine *D. fusc sanguinea* and the arctic *D. fusc sanguinea*.

The arctic species, named by them *Dasyscypha pini*, is based on the Brunchorst specimen and has ascospores distinct from the real *D. fusc sanguinea*. The above mentioned collections (Jørstad, Kujala) were checked and without any doubt they belong to *D. pini*, whereas Hahn & Ayers already proved the same for Lagerberg's fungus.

For Switzerland there exists a small note on the occurrence of *Lachnella pini* Brunch. (Rehm, 1951). This author writes: „An lebender Legföhre“. The swiss collection (Gremmen 748) proved to be the real *D. fusc sanguinea* Rehm and as far as is known it is the first record for that country, while certainly *Lachnella pini* Brunch. was a misidentification.

Rehm (1896) described the species from Tyrol (Austria), where it was found by him and his co-workers on *Pinus* species in the mountains.

According to Hahn & Ayers (1934) the arctic species, *Dasyscypha pini* (Brunch.) nov. comb. is associated with destructive can-

kers on *P. Strobilus*, *P. monticola* and *P. albicaulis* and they call *D. fuscousanguinea* an innocuous saprophyte, although the latter one does not occur in North America, but seems to be restricted to Central Europe.

There was some suggestion that *D. fuscousanguinea* parasitized the branches of *P. montana* in the Arosa alps, but this must be carefully investigated.

## 2. *Durandiella helvetica* Gremmen nov. spec.

On the same trees of *Pinus montana* light brown tops of shoots were noticed. These had been killed and all needles had been dropped. Here upon a search was made for the apothecia of *Scleroderris abietina* (Lgbg.) Gremmen, since this fungus was thought to be the real cause of the death. These fructifications, however, could not be

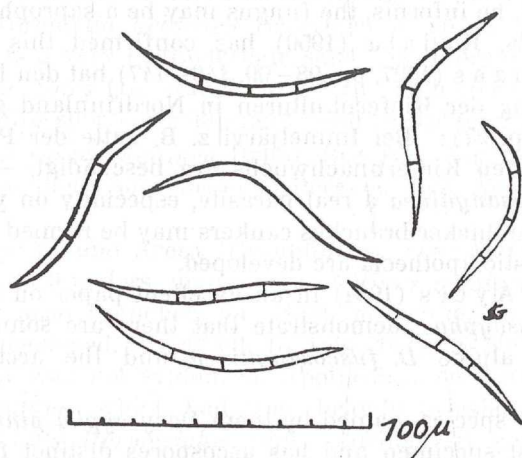


Fig. 1. *Durandiella helvetica* Gremmen n. sp.: ascospores.

detected, but instead of this species, a very few apothecia of an unknown Discomycete were found. Since it was not possible for me to find a description of this typical fungus in literature, it is described here as a new one.

At present, it is impossible to say whether this fungus has killed the shoots or not, since this was not investigated.

Apotheciis erumpentibus, solitariis, sessilibus, 1 mm in diam., atris; hymenio atro-viridi; hypothecio hyalino, plectenchymatico; excipulo atro-brunneo; ascis 144—160(170)  $\Rightarrow$  11—12(15)  $\mu$ , poro iodo ope non coerulescente; ascosporis (65)—76—84(88)  $\Rightarrow$  3—4  $\mu$ , hyalinis, elongatis, filiformibus, undulatis, continuis vel 3-septatis; paraphysibus hyalinis, filiformibus ad apicem leviter incrassatis agglutinatisque, epithecium fuscum formantibus.



Hab. ad ramis emortuis Pini montanae, prope Maran versus Arosa, Helvetia, 3. VI. 1954, leg. J. G r e m m e n.

Apothecia erumpent, separated, sessile, roundish, about 1 mm in diameter, black when dry. Hymenium olive-green, when mature surrounded by 3 till 4 fragments of the excipulum, about  $150\ \mu$  in thickness. Hypothecium  $60\text{--}75\ \mu$  thick in the centre, consisting of hyaline, interwoven hyphae. Excipulum darkbrown,  $70\text{--}90\ \mu$  thick, the upper part rupturing, when the apothecium becomes mature, so that the disc is liberated. Asci  $144\text{--}160(170) \Rightarrow 11\text{--}12(15)\ \mu$ , porus J —. Ascospores  $(65)76\text{--}84(88) \Rightarrow 3\text{--}4\ \mu$ , hyaline, elongated, filiform, with pointed ends, undulate, sickle-shaped or sigmoid, one-to four-celled, intertwined in the ascus. Paraphyses hyaline, filiform, tips swollen till about  $4\ \mu$ , brownish, rough, forming a characteristic brown epithecium.

When this fungus was investigated, the writer was inclined to refer it to *Godronia pineti* Jørst., a Discomycete occurring on *Larix sibirica* and on *Pinus* in Norway (Jørstad, 1925, pp. 129—130).

Through the kindness of Dr. I. Jørstad it was possible for me to study part of the type. It appeared, however, that *Godronia pineti* was quite distinct from this Discomycete, since the ascospores of the first are principally straight, needle-shaped, not-intertwined in the ascus, hyaline or sometimes light yellowish coloured and furnished with a great number of septae (according to Jørstad 30—35 septatae).

The ascospores of my collection, however, are always curved, intertwined in the ascus, colourless, primarily continous, but afterwards becoming 3-septate.

With the recent monograph on the genus *Durandiella* Seaver (G r o v e s, 1954), in which genus this fungus should be placed, it was not possible to identify the species. The spore-measurements were quite distinct from any one described by G r o v e s and to quote him: „Both the size of the asci and ascospores are important characters in distinguishing species“. We may further note that up till now conifers have never been recorded as hostplants of *Durandiella* species.

It seems also fully justified, after a critical study of literature, to erect a new member of this genus and the name *Durandiella helvetica* n. sp. is therefore proposed.

Since the genus has a predominantly north-american significance, it is very important to detect a new european member.

There is but one small collection, which is deposited in the authors herbarium with number 751, whereas photo-micrographs of the fungus have been forwarded to the Naturhistorisches Museum at Wien, the Kew Herbarium, The Herbarium of the Plant Pathological Department at Ottawa and to the Herbarium of the Plant Pathological Department of Cornell University at Ithaca.

On the same twigs apothecia of the Discomycete *Cenangium ferruginosum* Fr. were observed. This fungus is a very common one on dead branches of different *Pinus* species. Its biology has been investigated (Gremmen, 1952) and its saprophytical nature (Van Vloten & Gremmen, 1953) be settled.

3. *Tryblidiopsis pinastri* (Pers.) Karst., Myc. Fenn. 1. 262. 1871.

This fungus is a very common one in that part of the canton Graubünden, where it prefers inhabiting dead branches of *Picea Abies* (L.) Karst., with numerous apothecia. Nothing is known of a possibly parasitic nature, but instead of this its saprophytical character seems to be well established.

Description of the fungus (Gremmen 752). Apothecia about 1 mm in diameter, black when closed, horny, growing in groups, short stipitate; when mature the upper part of the excipulum stellately ruptures with 5—7 fragments, surrounding the disc. Hymenium milky-coloured, yellowish to lightbrown or greyish. The asci measure  $155-179 \pm 19-20 \mu$ , especially the upper part is very thick, J—. Ascospores  $38-42 \pm 11.4 \mu$  (measurements without the adhering slime mass), one-celled, when immature, but two-celled when ripen, surrounded by a thick layer of mucus, varying from  $5-6 \mu$  in thickness. Paraphyses filiform, colourless, about  $4 \mu$  thick, septate.

On dead branches of *Picea Abies* (L.) Karst., Litzirüti, near Arosa (Gremmen 752), June 12, 1954; environs of Arosa (Gremmen 755), June 6, 1954.

Statements about the real spore-measurements are very variable in literature.

Rehm (p. 194) found ascospores measuring  $18-27 \pm 6-7 \mu$ , agreeing well with the spores observed in young apothecia of my collections, ranging from  $23-27 \pm 5.7 \mu$ . Mature spores, however, are much larger as is shown in the above description and therefore I believe that Rehm has measured them in a state too young, what seems to be very obviously, since he informs: „Obgleich sie selten in vollständig reifem Zustande beobachtet wurde, —“.

The data on my spore-measurements have been obtained from spores naturally discharged on a glass slide in water and they prove to be considerably larger.

*Tryblidiopsis pinastri* may be easily confused with *Tympanis* species, the apothecia of which also develop on dead branches of conifers.

Rehm (1896) described the first fungus on dead twigs of *Pinus sylvestris*, which is not in accordance to Kujala (vide infra). The latter author never found this fungus on *Pinus*, but on *Picea*, *Larix*, *Abies sibirica* and incidently on *Pseudotsuga* too. This is confirmed by Jørstad (1925, p. 101), who found the organism confined to *Picea Abies* only.



I was not able to find the Discomycete on *Pinus* species, but always found it on *Picea Abies*.

*Tympanis pinastri* Tul., on the contrary, is a common species on dead twigs of *Pinus* and we may suppose that even Rehm sometimes confused them when studying them macroscopically, since he states: „Eine vielfältig verkannte und besonders mit *Tympanis pinastri* Tul. verwechselte Art“.

#### Acknowledgements.

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I also wish to express my great thanks to Dr. A. P. Koler, Wageningen, for assistance in preparing photomicrographs of *Durandiella helvetica* and to Miss D. Schans for valuable help in translating parts of danish and norwegian literature.

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