

DISCINA PARMA BREITENB. & MAAS G.
(HELVELLACEAE, ASCOMYCETES) IN SOME
VIRGIN FOREST NATURE RESERVES
OF SLOVENIA, YUGOSLAVIA

STANA HOČEVAR

(Institute for Forest and Wood Economy, Biotechnical Faculty, University
of Ljubljana)

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Introduction

During the investigations into the mycoflora of the virgin forest nature reserves of Slovenia, Yugoslavia, the author collected in 1976 a large ascomycete species at Gorjanci which is not included in the usual keys (Dennis 1968, Moser 1963). It was finally determined by Dr. M. Tortić (Zagreb), as *Discina parma* Breitenb. & Maas G., described only in 1973. A sample was sent to Dr. Maas Geesteranus, Leiden, who confirmed the determination. This find represents the second known, and, of course, the first for Slovenia and Yugoslavia.

In another virgin forest reserve, Rajhenavski Rog, the author noticed some macroscopically very similar but small, immature specimens which, from other indications also, seem to belong to the same species. Therefore, this locality is also taken into consideration.

After a short description on the basis of the Yugoslav specimens, an account of the ecological conditions in both localities will be given, which differ from those for the type locality.

Description of the specimens

The fruitbody consists of a receptacle elongated into a shorter or longer stipe (Fig. 1) occurring singly or several grown together. The receptacle is in the form of a shield, round or ellipsoid, in mature specimens 6.5 to exceptionally 14.5 cm in diameter (this was the length of the longer axis of the ellipse), a little depressed in the centre, with deeply radially wrinkled surface and revolute margin (Fig. 2). The colour

of the upper surface was brown, in some specimens almost exactly Methuen 6 E 7 (cognac), in others more like 7 E 7—6 (really between plates 6 and 7). In Séguy, the nearest colour would be No. 162. The colour was less reddish than that given in the original description (Séguy 191) but it is, of course, changeable owing to varying moisture contents.

The underside of the receptacle is lightly felted, smooth at the margin, otherwise, continuing from the stipe, it is folded into thick, rounded, more or less branched ribs (Fig. 1). The smooth part is of a yellowish greyish brownish colour; the nearest is M 5 C 3 (reddish blond, brownish orange). Somewhat similar are also Sé 133 and 337. In the original description, the colour of this part is cited as Sé 249 to Sé 193. The rest of the underside (the receptacle as well as the stipe) is whitish to white and in some specimens the contrast to the colour of the margin is very conspicuous. These parts become brownish on touching. The stipe was 2—5.5, exceptionally 9 cm long and 2—3 (4) cm thick. Flesh in fresh specimens was up to 3 mm thick, whitish, the ascus layer brownish. Smell pleasant, no particular taste.

Asci cca 350—400 × 20—22 μm, cylindrical, 8-spored, not reacting with J. Spores elliptical to somewhat spindle-shaped, hyaline with a characteristic reticulate, cyanophilous ornamentation which is prolonged at the ends into one or several straight or somewhat curved, 3.5—4.5 (5) μm long spines. The junctions of the ridges of the reticulum were occasionally also prolonged into spines, and, if at the same time the ridges were poorly developed, the spores were distinctly spinulose. Different types of ornamentation are shown on scanning electron micrographs (Fig. 3). The dimensions of the spores, measured without ornamentation, were (27)30—33(37) × 12—14(16) μm. In many spores there is one large oil drop in the centre, but the others also additionally often have one or two small ones towards ends. Occasionally, spores may have only one or two small drops. These drops are almost invisible in Melzer's reagent. Many deformed spores were also noticed. Paraphyses are about 4.5—6 μm broad, at the ends about 9—10 μm, septate, with yellow-brown granular contents.

The specimens therefore agree with the description of the type except that the stipe is often longer, even very long. The spores are also somewhat longer, as their length in the diagnosis is given as 26—28 (29.5) μm, but, according to personal information from Mr. Breitenbach, he has since observed spores of about 32 μm. It was unexpected to find many spores with only one oil drop. However, in one and the same ascus, spores with one to three drops could be observed. Several specimens are preserved at ZA, whilst some have been distributed to other herbaria.*

Description of the locality Gorjanci

The virgin forest nature reserve Gorjanci is situated on the mountain range of the same name, just beneath its highest peak, Trdinov vrh (1178 m), at 995—1160 m altitude, lat. 45°46'30", long. 15°20' SE of Novo mesto. It covers gentle slopes with a northerly exposition. Geologically

* BPI (The National Fungus Collection, Beltsville, Maryland), K (The Herbarium, Royal Botanic Gardens, Kew), L (Rijksherbarium, Leiden), PRM (Narodni Museum, Praha), S (Naturhistoriska Riksmuseet, Stockholm), ZA (Institute of Botany, Faculty of Science, Zagreb)

the area comprises upper cretaceous light brown bedded limestones and upper triassic grey bedded and massive dolomites on which rendzines and brown soil on limestone are developed.

The forest belongs to the association *Isopyro-Fagetum* Košir 1962 where the main tree species is *Fagus*, with occasional single specimens of *Acer pseudoplatanus*, *A. platanoides*, *Salix caprea* and *Sambucus nigra*.

On 9. 6. 1976 five specimens of *D. parma* were found on fallen rotten beech bark at an altitude of 1080 m. Next year 16 specimens were counted at the same time (9. 6. 1977) in the same place, growing not only on loose beech bark and a branch, but also on the upper side of a large prostrate beech trunk. Several grew on a stump of a branch of another trunk nearby, in close contact with the soil. Most fruitbodies developed on the bark, but some grew directly on wood under the loosened bark.

Both those found in 1976 as well as those in 1977 were at the peak of their development, fully fertile, with mature spores, and, except one or two, showed no trace of decomposition. In 1978 at the beginning of June still more specimens (about thirty) grew there on soil, and on 3. 7. about twenty, in good condition, were developed on both trunks, several bunches of fruitbodies growing where the trunks were in contact with the soil.

Plants growing nearby in shrub and herb layers were: *Acer pseudo-platanus*, *Lonicera alpigena*, *L. xylosteum*, *Arum maculatum*, *Circaea lutetiana*, *Dentaria bulbifera*, *D. enneaphyllos*, *Dryopteris filix mas*, *Galium odoratum*, *Polygonatum verticillatum*, *Rubus hirtus* and *Impatiens nolitangere*.

The following fungi were also observed in the vicinity, growing on dead trunks or branches of *Fagus*: *Armillariella mellea* (rhizomorphs), *Fomes fomentarius*, *Mycena haematopoda* (these three grew on same trunks as *Discina parma*), *Diatrype disciformis*, *Ustulina deusta*, *Marasmius alliaceus*, *Mycena galericulata*, *M. renati*, *Oudemansiella mucida* and *Coprinus micaceus*. *Polyporus squamosus* grew on an injured standing beech tree.

Description of the locality Rajhenavski Rog

This virgin forest nature reserve lies not very far (about 30—40 km) from the first one, but is situated on another mountain, Kočevski Rog, at an altitude of 855—915 m, lat. 45°40', long. 15°. It covers a karstic plateau with gentle slopes and rather deep dolines. The geological base comprises lower cretaceous white and dark grey limestones on which brown soil on limestone is developed.

Here, on rather rocky ground, the association *Abieto-Galietum odorati* (Piskernik 1976) is developed, with *Abies alba* as the main tree species, but with a large admixture of *Fagus sylvatica*, also *Acer pseudo-platanus*, *Ulmus glabra* and *Tilia platyphyllos* in a lesser degree.

At alt. 895 m three small immature and sterile specimens, in the form of shallow stipitate cups, were observed on 20. 5. 1976, developed on a fallen rather rotten beech trunk and on rotten beech bark lying on the ground. Afterwards, not a single one was found on the same beech remnant (the place was visited on 10. 6. 1977 as well as on 4. 6. and 10. 7. 1978).

The following plants were noted nearby: *Daphne laureola*, *Rhamnus fallax*, *Lonicera xylosteum*, *Daphne mezereum*, *Omphalodes verna*, *Car-*

damine trifolia, *Oxalis acetosella*, *Dentaria enneaphyllos*, and, on rocks, *Polystichum aculeatum*.

On the same beech trunk as the fruitbodies of the presumable *Discina parma* also grew *Polyporus squamosus*, *Peziza varia*, *Mycena renati*, *Ganoderma applanatum*, *Polyporus ciliatus*, and, under the bark, rhizomorphs of *Armillariella mellea*. Near this trunk was a lightning-struck fir tree with a growth of *Fomitopsis pinicola* fruitbodies, whilst *Cytospora pinastri* was noticed on fir needles.

As already stated, this locality cannot be considered as fully confirmed since the specimens were sterile. However, the macroscopic similarity of the fruitbodies with those in Gorjanci and, what is more, their growth on the same substrate, allow us to conclude that the same species was present in both localities. Someone might argue that the sterile specimens could belong to *Discina perlata*, which is known to occur on the same mountain and is macroscopically very similar, particularly seen from above. However, *D. perlata* grows on rotten stumps of conifers, here on those of *Abies*, which were plentiful in this locality, but on both occasions nothing like it was observed on them. Moreover, *D. perlata* develops earlier, in April and May.

It is to be hoped that the question will be satisfactorily settled in the near future, by finding fertile specimens.

Discussion

Discina parma was found first in Switzerland in a mixed floodplain forest of *Fraxinus*, *Ulmus*, *Corylus*, *Picea*, on humic soil rich in wood remnants, at an altitude of 570 m. The authors pointed out that most fruitbodies developed at the base of two *Fraxinus* trees. According to a personal communication by Mr. Breitenbach, one of the trees has now fallen down, being rotten, and, in 1977, many specimens grew on the prostrate trunk. *D. parma* is therefore a lignicolous species, as was first observed in the Yugoslav finds, and attacks the dead wood of angiosperms. It is possible that it prefers beech as a support, since, from personal information by Mr. Kriegelsteiner (Durlangen) to Dr. M. Tortić, the same species was collected in 1977 in Germany, also on beech.

As stated by Breitenbach and Maas Gesteranus (1973), the development of the spores apparently takes rather a long time. The fruitbodies collected on April 27 were completely sterile whilst those collected on May 19 had only a few mature spores. In Yugoslav localities, the specimens from Rajhenavski Rog had on May 20 no trace of spores in their asci, which were in an early stage of development, whilst these from Gorjanci were abundantly fertile on June 9 both in 1976 and 1977. It is probable, therefore, that here the development starts later owing to the altitude, which is almost twice that of the type locality, although much more southern. The reason why the specimens, as well as the spores, were somewhat larger than in the type, may be explained by their being fully mature.

The occurrence of *Discina parma* in forest containing beech points out the possibility of its being found in similar localities in other parts of Yugoslavia as well as elsewhere in Europe, but the specimens with the spore ornamentation not fully developed may be mistaken for some other species.

Summary

Discina parma Breitenb. & Mass G. was described in 1973. from Switzerland, where it grew on soil rich in wood remnants in moist forest of *Fraxinus*, *Ulmus*, *Corylus* and *Picea*, at the alt. 570 m. Later it was found growing on prostrate *Fraxinus* trunk. Now it has been found in mountainous areas of Slovenia (Yugoslavia): on Gorjanci, at an altitude of 1080 m, in beech forest (*Isopyro-Fagetum* Košir 1962), growing on dead beech bark, branch and trunks, and at Rajhenavski Rog, at 895 m alt., in the fir forest (*Abieto-Galietum odorati*). In the latter locality only some sterile specimens were found, also on beech wood, but, because of their macroscopic similarity and similar ecology, are considered as probably belonging to the same species. The Yugoslav specimens and their spores are somewhat larger than those in the Swiss material, which may be explained by the fact that they were fully mature when collected. It is to be expected that this species will be refound in other beech forests in Yugoslavia, particularly in nature reserves, as well as elsewhere in Europe.

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SADRŽAJ

DISCINA PARMA BREITENB. & MAAS G. (HELVELLACEAE, ASCOMYCETES)
U PRAŠUMSKIM REZERVATIMA U SLOVENIJI (JUGOSLAVIJA)

Stana Hočevar

(Inštitut za gozdno in lesno gospodarstvo pri Biotehniški fakulteti Univerze, Ljubljana)

Discina parma opisana je 1973. godine iz Švicarske, gdje je rasla u nizinskoj šumi (*Fraxinus*, *Ulmus*, *Corylus*, *Picea*) u visini od 570 m na tlu bogatom ostacima drveta. U najnovije doba ustanovljena je tamo i na ležećem trulom deblu jasena. U Jugoslaviji je sabrana 9. VI 1976. i 1977. te početkom VI i VII 1978. u Sloveniji u rezervatu Gorjanci na istoimenom gorju, ispod Trdinova vrha, na visini od 1080 m, i to na truloj

ležćoj kori, granama, i deblima bukve, u asocijaciji *Fago-Isopyretum thalictroidis*. Na Kočevskom Rogu, u rezervatu Rajhenavski Rog, na 895 m visine u asocijaciji *Abieto-Galietum odorati*, nađena su 20. V 1976 tri vrlo mlada primjerka također na ležećem trulom stablu bukve. Iako spore nisu bile razvijene, pa determinacija nije posve sigurna, prema ostalim indicijama najvjerojatnije se radilo također o ovoj vrsti. Primjerci iz Jugoslavije, a također i spore, nešto su veći nego je označeno u dijagnozi, po svoj prilici stoga što su bili posve razvijeni i zreli. U međuvremenu je autorica obaviještena da je ista vrsta nađena 1977. u Njemačkoj, također na bukvi. Prema tome je ovo lignikolna vrsta koja možda preferira bukvu kao podlogu i može se očekivati da raste u nas i u drugim bukovim šumama, naročito zaštićenim, a također i u drugim dijelovima Evrope.

Stana Hočevar
 Inštitut za gozdno in lesno
 gospodarstvo, Večna pot 30, p.p. 523-X
 YU-61001 Ljubljana (Jugoslavija)

Fig. 1. Fruitbody of *Discina parma* from Gorjanci nature reserve, 9. 6. 1977

Photo S. Tortié

Sl. 1. Primjerak *Discina parma* iz rezervata Gorjanci, 9. VI 1977

Foto S. Tortié

Fig. 2. Wrinkled upper surface of *Discina parma*, Gorjanci 9. 6. 1977

Photo S. Tortié

Sl. 2. Naborana gornja površina *Discina parma*, Gorjanci 9. VI 1977

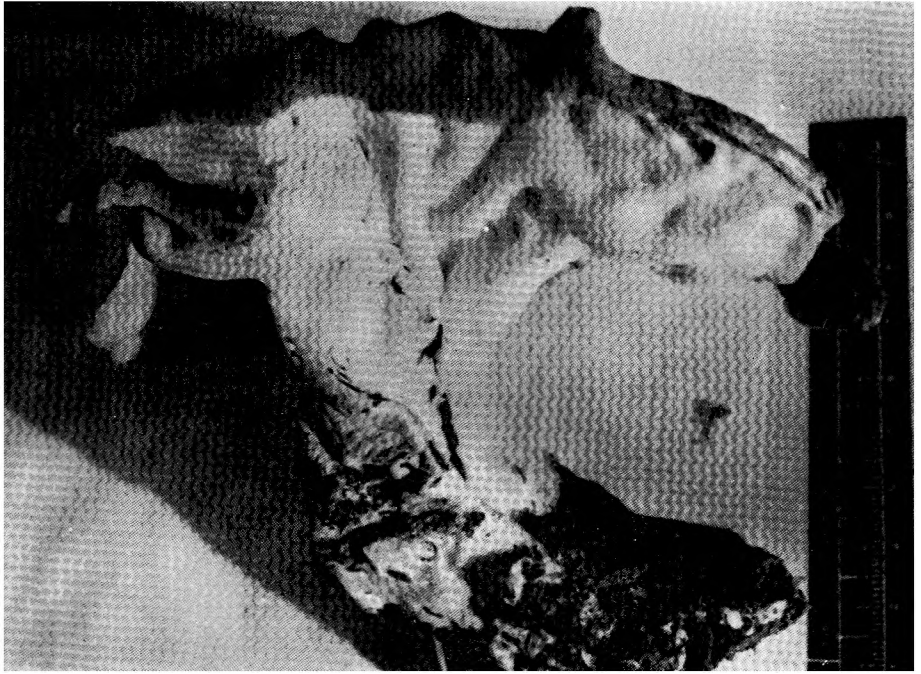
Foto S. Tortié

Fig. 3. Scanning electron micrographs of spores of *Discina parma*, Gorjanci 9. 6. 1977, showing spinulose ornamentation, reticulum and spines on both ends.

Sl. 3. Scanning elektronske fotografije spora *Discina parma*, Gorjanci 9. VI 1977, s bodljastom i mrežastom ornamentikom te bodljama s oba kraja.

Spores were photographed with scanning electron microscope JEOL JSM-UZ at the Institute of textile technology, University of Ljubljana

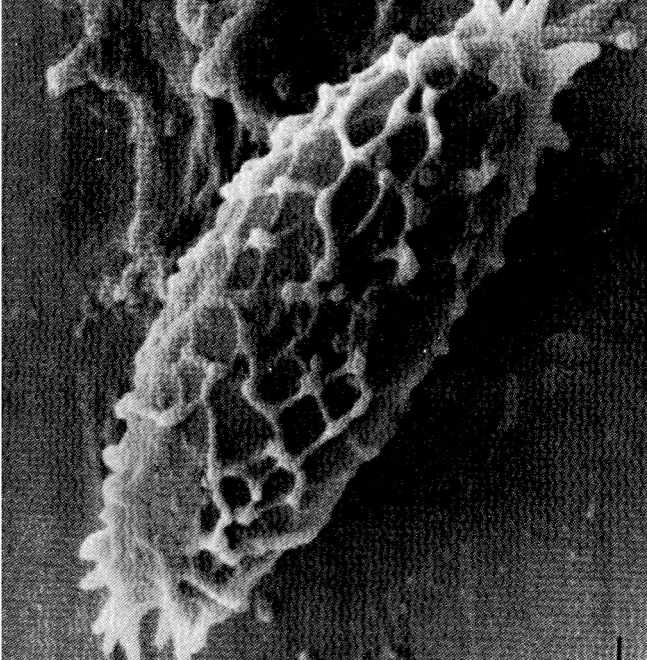
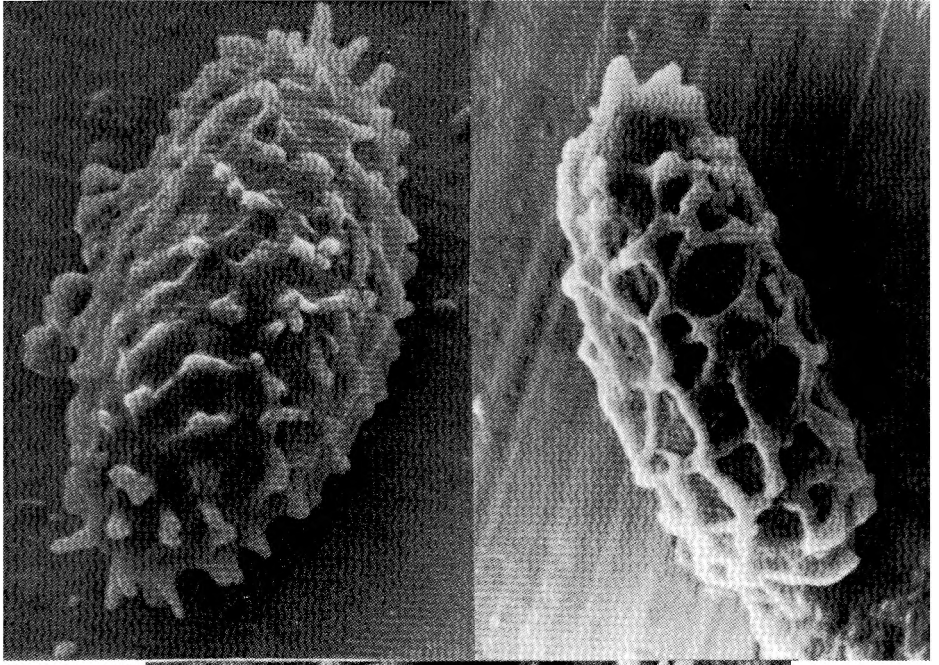
Spore su snimljene pomoću scanning elektronskog mikroskopa JEOL JSM-UZ na Inštitutu za tekstilno tehnologiju Univerze u Ljubljani



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