Zeitschrift: Mycologia Helvetica
Band: 8 (1996)
Heft: 2

Artikel: Two new brown-rot polypores from Italy
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DOI: https://doi.org/10.5169/seals-1036430

Two new brown-rot polypores from Italy

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Riassunto – Due nuove Polyporaceae, agenti di carie cubica, sono state rinvenute in Italia. Esse sono *Antrodia squamosella* Bernicchia & Ryvarden e *Fomitopsis labyrinthica* Bernicchia & Ryvarden.

Summary – *Antrodia squamosella* Bernicchia & Ryvarden and *Fomitopsis labyrinthica* Bernicchia & Ryvarden are described, based on collections from Italy.

Zusammenfassung – *Antrodia squamosella* Bernicchia & Ryvarden und *Fomitopsis labyrinthica* Bernicchia & Ryvarden werden mit Kollektionen aus Italien beschrieben.

Key words: Polypores, *Antrodia* and *Fomitopsis*.

Introduction

The polypores of Europe are well known after intensive collecting over several hundred years and two comprehensive floras covering the whole continent (Pilat 1936–41; Ryvarden & Gilbertson 1993–94). The last 20 years have seen only a handful of new species based on European specimens, most of them as a result of renewed examinations of previously widely defined species (David 1982; Renvall & Niemelä 1992). Thus, when we found two polypores which we were unable to name, we decided to let them rest for a while and see if an available name should come to mind.

The late Dr. M. A. Donk of Rijksherbarium in Leiden, a leading expert on European polypores (Donk 1974) once said that all European polypores have been named at least twice. Seeing from his checklist that he was true, we decided that a little caution would be proper. However, after many hours of microscopical work and comparisons with type material and specimens of

some rare European species, we came to the result that we actually were confronted with specimens of two striking new species which herewith are described.

Antrodia squamosella Bernicchia et Ryvarden sp. nov.

Carposomata annua, pileata, dimidiata, sessilia usque ad lateraliter substipitata, stipite brevi, laterale, brunneo. *Pileus* carnosus-lentus, levis, brunneo colore, squamulosus, raro glaber, longis et radiatis squamulis, 2 cm latus et 8 mm crassus. *Pori* rotundi vel subangulati, 2–3 per mm, aliquando ampliores, dissepimentis tenuibus. Superficies poroidea alba-cremea. *Tubuli* unistratosi, usque ad 5 mm lati, concoloribus cum superficie poroidea. *Contextus* albus, 4 mm latus. *Systema hypharum* dimiticum: hyphae generativae hyalinae, ramosae, fibulatae, tunicis plus minusve tenuibus, 2–4 µm latae. Hyphae skeletales leviter flexuosae, crassitunicatae, 2–4.5 µm latae. *Cystidia* hyalina, leves, clavata, expansa base, 70–100 µm longa et 8–10 µm lata. *Basidia* clavata, hyalina, 25–40 × 6–9 µm, 4 sterigmatibus. *Basidiosporae* hyalinae, leves, tenuitunicatae, nonamyloideae, oblongae ellipticae, rotunda base et exacuto apiculo, interdum leviter naviculae forma, pluriguttulatae, 10–12 × 4.5–5(5.5) µm.

Cariem brunneam in ligno juniperino producet.

Holotypus: Italy, Supramonte di Orgosolo, Campu'e su mudrecu (Nuoro), (in a *Juniperus* forest destroyed by the fire during 1931), I.G.M. 1:25 000, 500–3, m 1000 a.s.l., 9 November 1994, on burnt trunk of *Juniperus oxycedrus* L. subsp. *macrocarpa* (S. et S.) Ball, Leg. A. Bernicchia et S. Curreli, coll. 6650 (HUBO, holotypus and isotypus; O, isotypus).

Other specimens examined: collections as the holotypus, Bernicchia (HUBO) 6649; coll. 3809, 07.XI.85 from the same locality and substratum.

Antrodia squamosella Bernicchia et Ryvarden

Etymology: from the radially elongate squamules on the pileus surface.

Basidiocarps annual, pileate, sessile and dimidiate to laterally semistipitate, pileus up to 2 cm wide and long and 8 mm thick. Upper surface smooth and glabrous when young and fresh, wrinkled when dry, evenly brownish when mature, with radially elongated tiny squamules or tufts of hyphae, strongly reminding about a down scaled upper surface of *Polyporus squamosus* Huds.:Fr.

Pore surface whitish when fresh, drying ochraceous. Pores round to angular, thinwalled, 2–3 per mm, a few wider at sloping parts of pore surface; tubes concolour with the pore surface, up to 5 mm deep, fragile when dry. Context white, up to 4 mm thick, contrasting the darker tubes. The short stipe (less than 1 cm long, longer in the specimens growing in a crack) is concolour or darker than the upper surface, cylindric, smooth or slightly velvety, hirsute and whitish at the base (Figs. 1–2).

Fig. 1: Carpophore of Antrodia squamosella *(Photo S. Curreli).*

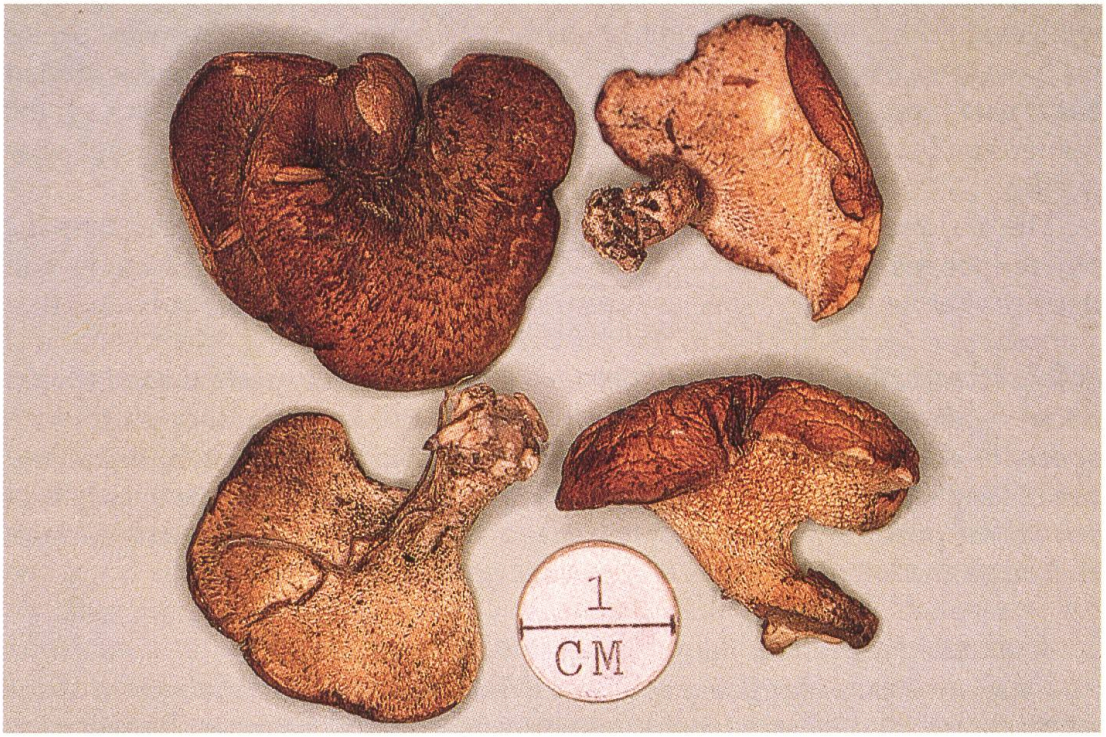

Fig. 2: Carpophores of Antrodia squamosella: *dried collections (Photo F. Padovan).*

Hyphal system dimitic: generative hyphae branched, clamped, with more or less thin walls, 2–4 µm; skeletal hyphae hyaline, thick-walled, slightly sinuous, 2–3 µm wide in the context, up to 4.5 µm in the trama. Hymenial cystidia abundant, arising in the subhymenium, hyaline, clavate with slightly widened lower part, smooth, up to 70–100 µm long and 8–10 µm wide. Emergent part up to 40–50 µm long. Some cystidia have the apical part collapsed. Basidia clavata, 25–40 × 6–9 µm with 4 sterigmata, 5 µm long. Basidiospores oblong ellipsoid with rounded base and pointed apiculus, a few spores slightly navicular, hyaline, thin-walled and negative in Melzer's reagent, 10–12 × 4.5–5(5.5) µm, with smaller or larger oily inclusions (Fig. 3).

Substrate: causing brown rot in *Juniperus oxycedrus* L. subsp. *macrocarpa* (S. et S.) Ball.

Remarks: macroscopically this species reminds strongly about a minute *Polyporus* species because of the minute scaly pileus and the semistipitate basidiocarps. However, growing on and with mycelial strings clinging to a deeply brown rotted substrate, immediately rises suspicion. A microscopical examination confirms the doubt as no binding hyphae of the *Bovista* type are present, to the contrary the trama and the context are dominated by unbranched skeletal hyphae. The combination of brown rot and a dimitic hyphal system with skeletal hyphae points clearly to *Antrodia* based as it is on just these characters.

The most remarkable character in this species is the long projecting thin-walled, slightly widened cystidia, a character unknown in all *Antrodia* species we have seen. They are present in all specimens cited above and their widened basal part indicates that they are not only hyphal ends growing through the hymenium because of the basidiocarps being placed upside down under slow drying.

The basidiospores of *A. squamosella* fall within the range known in *Antrodia* where spores length varies from 5 to almost 20 µm. Only future collections will decide whether the new species is restricted to *Juniperus* species only. Another *Antrodia* species resctricted to this host genus is *A. juniperina* (Murr.) Niemelä & Ryv., which however has smaller spores and large angular pores (1–3 mm wide). Microscopically, *A. variiformis* (Peck)Donk comes rather close with spores 8–12 × 3–4.5 µm but they are narrower and distinctly cylindrical and not oblong ellipsoid as in *A. squamosella*. Further, *A. variiformis* is evenly brown on the pore surface and context, has a slightly tomentose pileus surface, and large and irregular pores (1–2 per mm).

Fomitopsis labyrinthica Bernicchia et Ryvarden sp. nov.

Carposomata annua, pileata, sessilia, effusa reflexa, imbricata, concreta usque ad multa cm lata. *Pileus* rugosus, tomentosus, zonatus, brunneus autem marginibus albis vel cremeis, crassis, concoloribus cum superficie poroidea. *Pori*

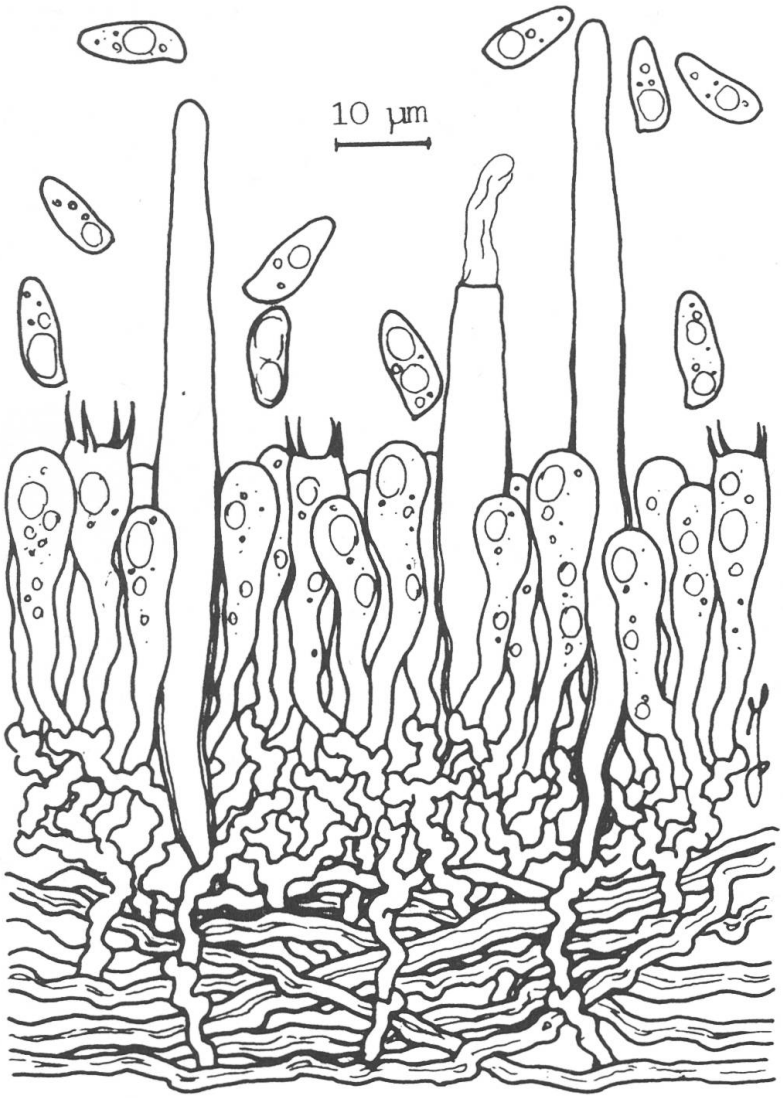

Fig. 3: Hymenial elements of Antrodia squamosella *(drawing of F. Padovan).*

plus minusve inaequales prope marginibus, saepe oblongi, denticulati, labyrinthiformes, 2–3 per mm, dissepimentis crassis. *Contextus* tenuis, albus vel cremeus, azonatus. *Tubuli* unistratosi 2–4 mm lati. *Systema hypharum* trimiticum: hyphae generativae hyalinae, fibulatae, ramosae, 1.5–3.0 µm latae, tunicis plus minusve tenuibus, hyphae skeletales 2–3 µm latae, rectae vel flexuosae, intertextae vel subparallelae, crassitunicatae, solidae; hyphae conjunctivae tortuosae, ramosae, crassitunicatae, 2–3 µm latae. *Cystidioli* hyalini, fusiformes, flexuosi, tenuitunicati, 35–45 µm longi et 2.5–3 µm lati. *Basidia* clavata, hyalina, 14–21 × 4.5–5.5 µm, 4 sterigmatibus. *Basidiosporae* hyalinae, leves, cylindraceae vel cylindraceae-fusiformes, nonamyloideae, nondextrinoideae, tenuitunicatae 7–8.4 × 2–2.2 µm.

Fig. 4: Carpophores of Fomitopsis labyrinthica *(Photo F. Padovan).*

Cariem brunneam in ligno producet.

Holotypus: Italy, Parco Nazionale delle Foreste Casentinesi, Riserva Naturale Integrale di Sasso Fratino, (Forlì), m 1000–1050 a.s.l., I.G.M. 1:25 000, 265–3, in trunco *Abies alba* 18.X.95. Legit A. Bernicchia et F. Padovan, coll. 6497 (H.U.B.O.: holotypus and isotypus; O: isotypus). Other specimens examined: collection as the holotypus, Bernicchia (HUBO) 6595, 25.X.95 from the same locality and substratum.

Fomitopsis labyrinthica Bernicchia et Ryvarden

Etymology: from the shape of pore surface.

Basidiocarps annual, pileate, sessile, effused-reflexed, pilei in imbricated clusters. Upper surface scrupose, hirsute, often green due to algae, zonated, brown. Margins thick, white to ivory as the pore surface. The pores irregular, more or less angular, dentate in the marginal part; daedaloid, labyrinthiform in the central part, 2–3 per mm. The dissepiments are entire and thick. The con-

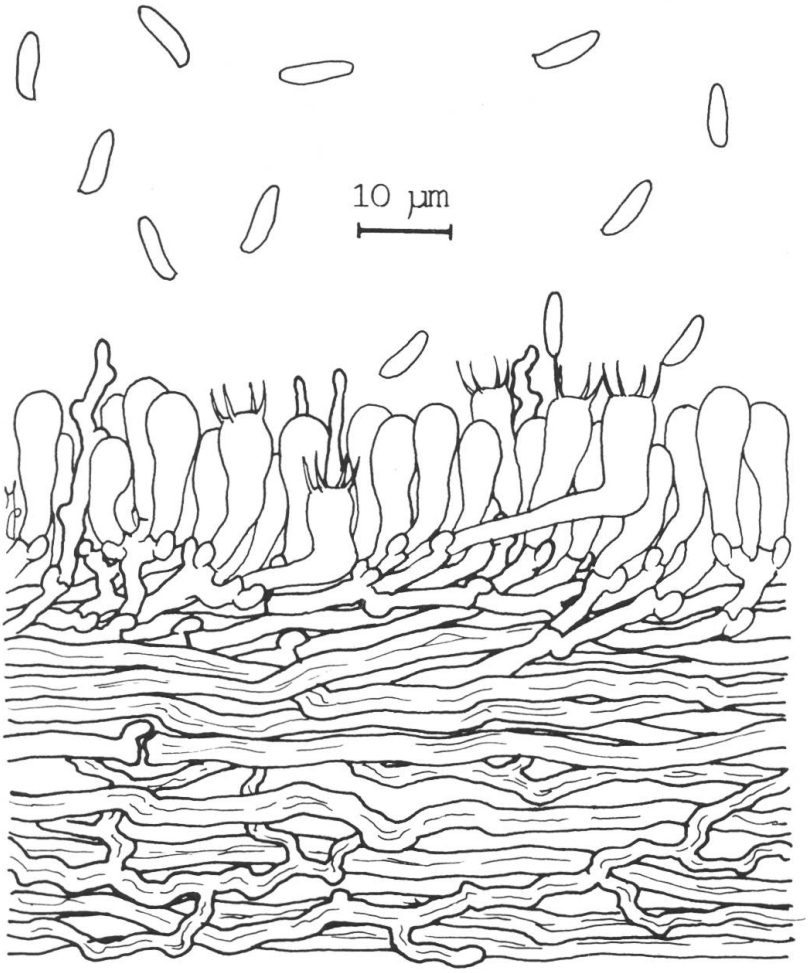

Fig. 5: Hymenial elements of Fomitopsis labyrinthica *(drawing of F. Padovan).*

text is very thin, white to ivory, azonate but brown coloured close to the upper surface; tube layer concolour with the context, up to 4 mm thick (Fig. 4).

Hyphal system trimitic: generativae hyphae clamped, thin-walled or slightly thick-walled, hyaline, branched, 1.5–3 µm in diam; skeletal hyphae thick-walled to solid, non septate, 2–3 µm wide, straight to sinuous; binding hyphae twisted, branched, thick-walled, 2.5–3 µm in diam.

Fusoid cystidiols present, hyaline, thin-walled, slightly projecting, 35–45 × 2.5–3.0 µm. Basidia clavata with 4 sterigmata and a basal clamp, 14–21 × 4.5–5.5 µm. Basidiospores hyaline, thin-walled, smooth, IkI–, cylindric to fusoid-cylindric, to navicular 7–8.4 × 2–2.2 µm (Fig. 5).

Substrate: causing brown rot on *Abies alba.*

Remarks: *F. labyrinthica* belongs in the *F. palustris* (Berk. et Curt.) Gilbn. & Ryv. group because of the narrow navicular to fusiform basidiospores and it is probably most closely related to *F. iberica* Melo & Ryvarden, which however

has much thicker basidiocarps, regular pores and no upper brown layer of hyphae, besides that, the spores of that species are wider (2.8–3.7 µm). *F. nivosa* (Berk.) Gilbn.& Ryv. an American and tropical species not yet recorded in Europe, has similar spores, but tiny small regular pores (6–8 per mm). *Pilatoporus maroccanus* Kotl. & Pouzar was recently described from Morocco (Kotlaba & Pouzar 1993) with spores reminding of those of *F. labyrinthica*, although narrower (2.5–3.5 µm). However when borrowing the type for an examination we discovered that P. Vampola had already done the same and revised the type to be a specimen of *Trametes suaveolens* (L.:Fr.) Fr. To us the revision seems to be correct, even if the original authors indicated the rot to be brown and the host to be *Cupressus sempervirens*, a character and a host hitherto completely unknown for *T. suaveolens*.

The most striking feature of *F. labyrinthica* is its similarity to *Cerrena unicolor* (Bull.:Fr.) Murr. by its labyrinthine pore surface and its greenish algal infected adpressed pileus under which there is a distinctly brown coloured zone. However, in *C. unicolor* there is a narrow black line or zone between the upper often slightly greyish tomentum and the lower white context. Such a line is not present in *F. labyrinthica.* Further, the spores of *C. unicolor* are ellipsoid, thus distinctly different from the fusiform cylindric spores of *F. labyrinthica*.

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