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PORIA ELONGATA OVERH. IN POLAND

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(With six Text-figures)

A description is given of *Poria elongata* based on fruitbodies found in Poland. The new combination *Perenniporia elongata* is proposed for this species and its relationships are extensively discussed.

Until recently the saprobic polyporaceous fungus *Poria elongata* Overh. was known only from the United States (Michigan, New York, and Pennsylvania), where it occurs on wood of angiosperms, causing a white rot (Lowe, 1966: 121).

In Poland a number of fruitbodies were found on a fallen log of *Fagus silvatica*, covering a rather extensive surface of the wood, which showed symptoms of white rot.

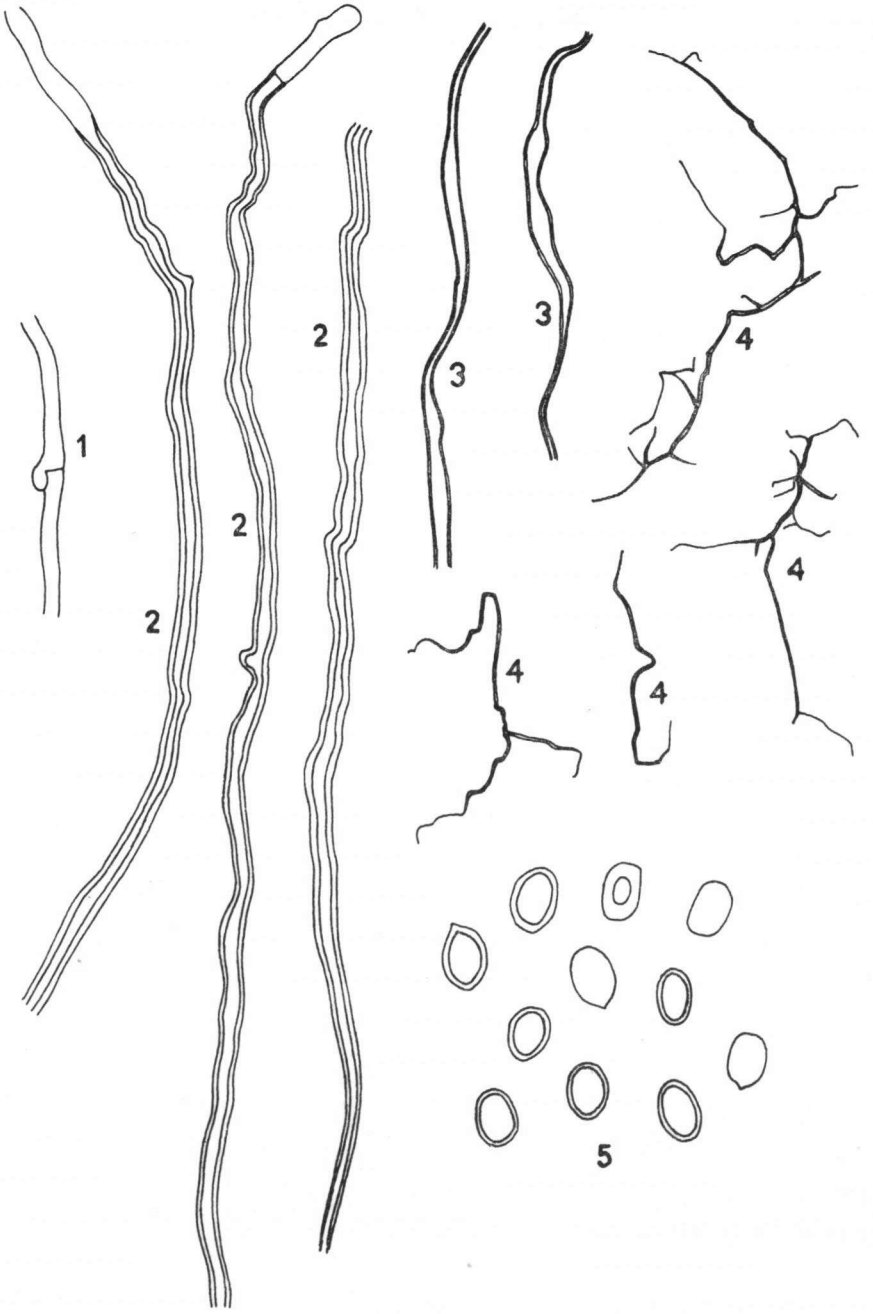
The present paper deals with the results of my studies on this fungus carried out mainly with the view to establish its possible relationships. For this purpose the following material was examined: —

POLAND: Carpathian Mountains, distr. Ustrzyki Dolne, Zatwarnica, on *Fagus silvatica*, Aug. 1965, S. Domanski (HMIPC 4820).

USA: New York, White Lake near Jamesville, on *Acer* (?), 27 Sept. 1951, J. L. Lowe (SYRF 5208).

The description given below was drawn up from the Polish material; microscopic observations, measurements, and drawings were made from sections mounted in Melzer's reagent.

Fruitbody annual, effused, at first more or less circular, 2–3 cm in diameter, 0.2–0.3 cm thick, white with shallow tubes, subsequently confluent with adjoining fruitbodies to form large, flat-pulvinate, resupinate patches up to 30 cm in diameter and up to 0.5–1 cm thick, soft-fibrous, firmly attached to the substratum, white, with fimbriate-fibrous, 0.1–0.3 cm wide, sterile, white margin. When dry and old the colour of the fruitbody turns cream or wood-colour or somewhat yellowish-brown, the margin often a brownish-red, soft leathery, up to several cm wide, sterile. Context thin, up to 0.1–0.3 cm thick, white, soft-fibrous, becoming wood-colour and somewhat tough with age and when dry, taste mild. Tubes of the same colour and consistency as the context, 1-layered, 0.2–0.7 cm long, the dissepiments thin, with entire edges, finally becoming fimbriate. Pores small, rather regular, circular to angular, 3–4(–5) per mm. Hyphal system trimitic. Generative hyphae hyaline, thin- to somewhat thick-walled, nodose-septate, branched, 3–5 μ in diameter, sparse, comparatively most numerous in the marginal area. Skeletal hyphae slightly to rather thick-walled (with thin-walled apical portions in the edge of the dissepiments), of equal diameter or gradually tapering towards the base or, often



Figs. 1–5. *Poria elongata* Overh. — 1. Generative hypha. — 2. Skeletal hyphae from dissepiment. — 3. Skeletal hyphae fairly numerous in the context. — 4. Binding hyphae from context. — 5. Spores. (Figs 1–4, × 800; Fig. 5, × 1600.)

mainly in the context, irregularly and repeatedly contracted, 1.5–5 μ in diameter, rarely branched, often flexuous, non-septate or rarely septate, without clamps, acyanophilous, dextrinoid in the subhymenium, slightly amyloid both in the dissepiments and the context, quickly dissolved in KOH solution. Skeletal hyphae making up the bulk of both the context and the dissepiments, interwoven in the former, predominantly parallel in the latter. Binding hyphae scarce, relatively more numerous in the context, slightly thick-walled to thick-walled, non-septate, strongly twisted and intricately branched, 1–3 μ in diameter. Hymenium composed of cystidia and basidia. Cystidia not numerous, usually variable, slightly projecting or mostly immersed, thin-walled, subulate to clavate, sometimes with a bulbous base, 15–17.5 × 5–7 μ. Basidia broadly clavate, 10–12(–15) × 6–8 μ, with 4 sterigmata. Spores ellipsoid to broadly ellipsoid, sometimes as if indistinctly truncate at one end, 4–5.5 × 3–3.5 μ, thin-walled, rarely with thickened cell-walls which are hyaline, smooth, cyanophilous, slightly dextrinoid, inamyloid.

In trying to determine whether the present species is related to one of the 'natural' groups of polyporaceous fungi thus far known, I paid attention to four elements generally considered to be an index of the rank of evolution or of the relationship of polypores, at least of those associated with rot in wood: (i) the type of rot since this may indicate the rate of physiological evolution in a wood-rotter (Nobles, 1958: 888; 1965: 1103); (ii) the shape of the fruitbody since this shows the rate of the external evolution in this important organ (Kreisel, 1967); (iii) the hyphal construction which to a high degree determines the characteristics of context and dissepiment trama; and finally (iv) the composition of the hymenium and the features of its elements.

Considering the data enumerated above, the possible relationships of *P. elongata* have to be looked for among the polypores, which (i) cause white rot in wood, showing them to be physiologically more advanced, (ii) produce resupinate fruitbodies, and (iii) have a trimitic hyphal system consisting of hyaline hyphae, with nodose-septate generative hyphae. Thus far only eight species of polypores are known to answer this set of characters, seven of which are 'resupinate' and one 'effused-reflexed' with tendency to form resupinate portions. These are: —

I. *Pachykytospora tuberculosa* (DC. ex. Fr.) Kotl. & Pouz., *Poria alabamae* (Berk. & Cooke) Cooke, and *Poria papyracea* (Schw.) Cooke. The first is the type species of the natural monotypic genus *Pachykytospora* Kotl. & Pouz.; the other two species, although probably related to this genus, are as yet retained in the artificial genus *Poria* Pers. ex S. F. Gray. All three species differ sharply from *P. elongata* in their peculiar spores which are characterized by oblong-cylindric shape, large dimensions (7–17 μ long) and, often, the possession of echinulae. Moreover, as pointed out by Kotlaba & Pouzar (1963: 27), the walls of the spores of *P. tuberculosa* are not only cyanophilous, but also double and of a specific structure.

II. *Leptotrimitus semipileatus* (Peck) Pouzar, the type species of the monotypic genus *Leptotrimitus* Pouzar, is the fourth species to be discussed. Its fruitbody is effuso-reflexed, more rarely resupinate, and its context is trimitic. Notwithstanding

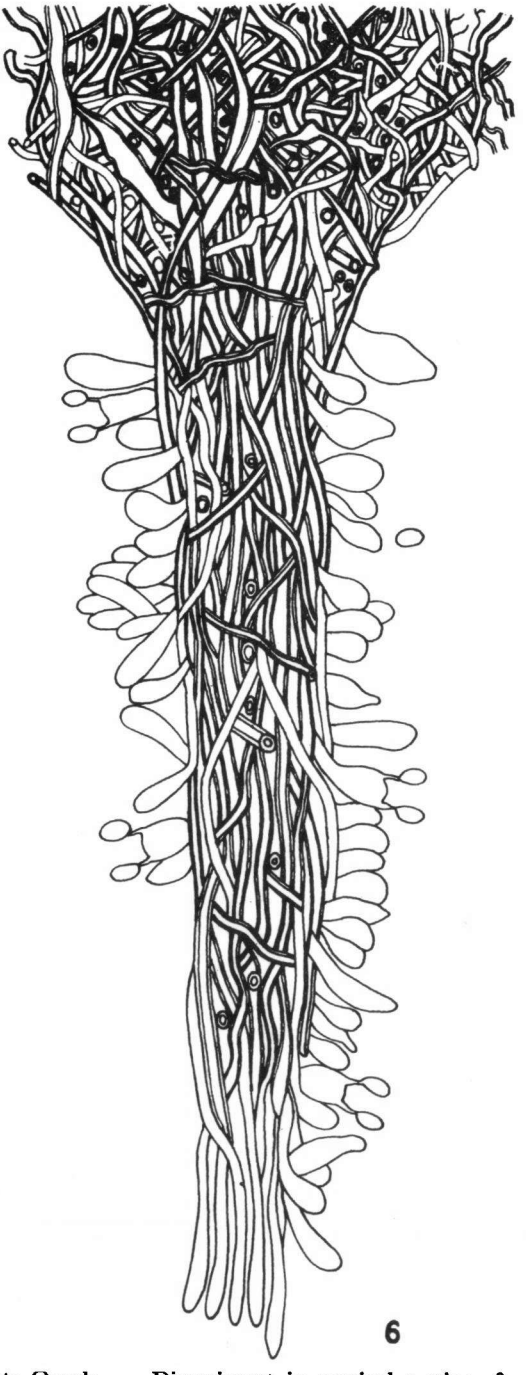


Fig. 6. *Poria elongata* Overh. — Dissepiment in vertical section, from Polish collection (× 800).

this, the species was recently transferred by Donk (1971: 39) to *Incrustoporia* Domanski, a genus of resupinate species with dimitic context. The arguments for this transfer were found in a set of characters that connect *L. semipileatus* with *Incrustoporia*, such as the composition of the hymenium, the very small, allantoid spores which are neither cyanophilous nor dextrinoid, the incrusted hyphal ends at the edge of the dissepiments (an important feature by which the species can be distinguished from *P. elongata*), and the cultural behaviour of the mycelium. These characters have so much weight that I am inclined to agree with Donk's point of view in regarding, in this case, the trimitic hyphal structure of *L. semipileatus* as a feature of infrageneric importance. It is necessary, however, to emphasize the structural difference between the hyphal systems within the genus *Incrustoporia* Domanski em. Donk (1971: 37) by introducing the following two subgenera:—

1. Subgenus *Incrustoporia*, comprising such 'resupinate' species with dimitic context like *I. stellae* (Pilát ex Pilát) Domanski, *I. tschulymica* (Pilát) Domanski, *I. subincarnata* (Peck) Domanski, and *I. alutacea* (Lowe) Reid.

2. Subgenus **Leptotrimitus** (Pouzar) Domanski, *comb. nov.* (basionym, *Leptotrimitus* Pouzar *in* Česká Mykol. **20**: 175. 1966) with the 'effused-reflexed' species *I. semipileata* (Peck) Donk whose context is trimitic.

III. Of the artificial genus *Poria* the two species *P. linearis* Murrill and *P. cinerascens* (Bres.) Sacc. & Syd. require a discussion.

Poria linearis I find difficult to regard as closely related to *P. elongata* because the former has oblong-cylindric spores and a hyphal system, in which the binding hyphae are abundant and the skeletals more sparsely represented.

On the other hand *Poria cinerascens* seems to be more closely related to *P. elongata* even in spite of its spores being narrow, allantoid, and neither cyanophilous nor dextrinoid. It is not only that the two species, *P. cinerascens* and *P. elongata*, do not differ in the structure and number of skeletal hyphae in context and dissepiment trama, but more in particular do they resemble each other in having in common skeletals that dissolve quickly in a KOH solution. In most specimens of *P. cinerascens*, moreover, e.g. those from the Bialowieza virgin forest in Poland, the walls of these skeletals are slightly amyloid like those in *P. elongata*. Their amyloidity, however, is hard to see in individual skeletals and best observed where these hyphae form compact masses, e.g. in longitudinal sections of dissepiments.

IV. *Perenniporia medulla-panis* (Jacq. ex Fr.) Donk is the type species of the natural genus *Perenniporia* Murrill. The generic name has recently been reintroduced by Donk (1967: 74) to replace *Poria* Pers. ex S. F. Gray. In order to avoid further taxonomic complications, Donk rightly suggested (1960: 269 and 1967: 51) that the name *Poria*, although a valid name for a natural group of polypores, be retained for the artificial (residual) genus, in which a large number (more than one hundred) of miscellaneous species of resupinate polypores must find a place as long as their natural classification is being elaborated.

In this genus *Perenniporia* Donk also included *P. subacida* (Peck) Donk, a species to

which *Poria elongata* shows great affinity. This is apparent above all from the composition of the hymenium and certain features of its elements: (i) the spores are broadly ellipsoid, sometimes slightly truncate, especially in the Polish material, fairly thick-walled, and cyanophilous as well as dextrinoid; (ii) the cystidia are small, thin-walled, subulate to clavate, and thus far only in the Polish material seen to project somewhat beyond the basidia; (iii) the basidia are broadly clavate to subovate. Moreover, the hyphal structure of the fruitbody in both species is very similar: the skeletal hyphae with somewhat thickened to fairly thick walls are by far the dominant type, whereas the generative and binding hyphae are very rare and similarly shaped (cf. Domanski, 1964: fig. 2). Lowe (1966: 120) described *Poria elongata* as dimitic, and it is certainly true that the binding hyphae in the American specimen examined were exceedingly difficult to find.

Taking together the data mentioned above, *Poria elongata* appears to be a species with features partly intermediate between those of *Poria cinerascens* and *Perenniporia subacida*, but with a distinctly more pronounced affinity with the latter. This affinity is expressed in the removal of the species from the artificial genus *Poria* and the proposal of the recombination **Perenniporia elongata** (Overh.) Domanski, *comb. nov.* (basionym, *Poria elongata* Overh. *in* Techn. Bull. Pa. agric. Exp. Stn **418**: 28. 1942).

Perenniporia elongata differs from both *P. medulla-panis* and *P. subacida* particularly in (i) having skeletals whose slightly amyloid walls dissolve quickly in a KOH solution, and (ii) producing annual fruitbodies.

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