

# *Aurantiporus priscus* (Basidiomycota), a new polypore from old fallen conifer trees

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A new species in Basidiomycota, *Aurantiporus priscus* Niemelä, Miettinen & Manninen, growing on large, long-ago fallen and decorticated conifer trunks, is described from old virgin forests. We report it from Finland, Poland and Sweden. Its fresh tubes are fleshy, soft and pale salmon-coloured, contrasting with a cottony and orange- to tan-coloured subiculum. With KOH, the tubes only darken, while the subiculum and fruitbody margin of fully-grown basidiocarps become bright cherry-red. This species has been confused with *Hapalopilus aurantiacus* and *H. ochraceolateritius*, which have cylindrical spores, while the spores of *A. priscus* are ellipsoid. The type of *Polyporus salmonicolor* was reviewed.

## Introduction

Niemelä *et al.* (2005) and Niemelä (2005) showed that material identified as *Hapalopilus salmonicolor* in northern Europe was heterogeneous. Three species were distinguished within the group:

1. *Hapalopilus aurantiacus*, the most common species in the group with orange, thick basidiomes and cylindrical spores;
2. *Hapalopilus ochraceolateritius*, a close relative of *H. aurantiacus* with thinner basidiomes and narrow cylindrical spores;
3. *Erastia salmonicolor*, with pale salmon-coloured basidiomes and ellipsoid spores.

However, we have recently studied the type of *Polyporus salmonicolor*, and came into the conclusion that it was a species different from

*Erastia salmonicolor sensu* Niemelä (2005). Thus the latter species has to be given a new name.

The polypore described below seems to be a rarity of old-growth forests. This is one of the reasons why it has been overlooked, the other reason being the pinkish or salmon colour of the basidiocarp, which reminds that of several other polypore species, many of them rare as well. Most of these species change considerably upon drying, and the original colour characteristics are not seen in herbarium specimens.

## Material and methods

Type material of *Polyporus salmonicolor* was studied from the Kew herbarium (K). We have collected the new species in Finland, Poland and Sweden, and fresh character descriptions



**Fig. 1.** *Aurantiporus priscus* growing on decayed trunk of *Pinus sylvestris*. Specimen Niemelä 7082 *et al.* (H).

are based on those collections. Specimens of the Helsinki University herbarium (H) were studied.

The microscopic routine used in this study was discussed in detail by Miettinen *et al.* (2006). The basic mounting medium used was Cotton Blue (CB) made in lactic acid, but also Melzer's reagent (IKI) and 5% KOH were used. The entry CB+ means cyanophily, CB– acyanophily; IKI– means neither amyloid nor dextrinoid reaction. The microscopy drawing was made from slides mounted in CB. The term *kraft* is used for the sordid brown colour of unbleached cardboard.

## Taxonomy

***Aurantiporus priscus*** Niemelä, Miettinen & Manninen, *sp. nova* (Figs. 1 and 2)

MB 564907

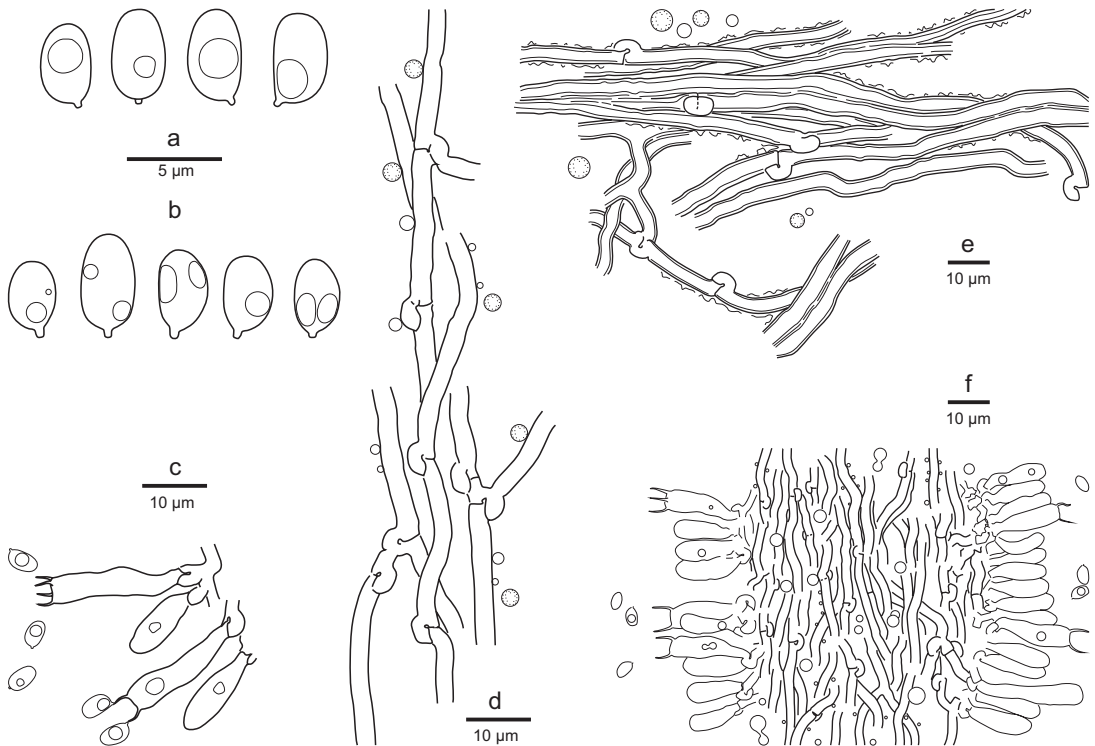
*Basidioma annuum, resupinatis, colore pallide roseo-vinosus vel roseo-bubalinus; systema hypharum monomiticum, sporis ellipsoideis, 3.8–4.8 × 2.5–3.0 μm.*

**HOLOTYPE:** Poland. Podlesie Reg., Hajnówka Dist., Białowieża National Park, Poprzeczny Tryb, *Picea abies*, 10 Sep. 2009 Tuomo Niemelä 8586 & Dmitry Schigel (H 7005695, isotype KRA).

**ETYMOLOGY:** *priscus* (Lat., adj.), of former times, ancient, referring to the forests in which the species lives.

Annual, resupinate, a few cm across or up to palm-sized, waxy and juicy when fresh and easily splitting along tubes if bent, constricting upon drying and tending to roll inwards. Young pore surface pale pinkish white, attaining salmon or rosy hues (no yellow) towards maturity; no strong colour changes in bruised parts; tan or kraft paper coloured when dry. Sterile margin soft felty when fresh, pale pinkish ochraceous, mostly narrow but in some areas 5–10 mm broad. Pore surface even; pores angular, 2–4 per mm. Section: subiculum soft felty or slightly fibrous, ochraceous yellow when fresh; fairly hard and pale pinkish tan or in older parts waxy and reddish black when dry; tubes waxy, when fresh pinkish white, colour contrast in fresh specimens clear between subiculum and tubes, dry tubes the colour of unbleached kraft paper, darker brown to reddish black towards the base; total thickness 3–10 mm. KOH causes only slight darkening on tubes, but ochraceous parts (old margin, subiculum) change rapidly to cherry-red. No distinct odour or taste.

Monomitic, hyphae with clamp connections, CB–, KOH–, IKI–; brownish oily matter abundant in between the hyphae. Subicular hyphae hyaline, slightly thick-walled but with a wide lumen, (2.5–)4.2–5.9(–7.6) μm, uniform, arranged in sub-parallel bundles and spaced interwoven areas in between, hyphae covered with greasy, brown, granular matter. Tube tramal hyphae thin-walled, compactly subparallel under hymenium but more



**Fig. 2.** Microscopy of *Aurantiporus priscus* (b from Niemelä 7082 et al., d from Vehmaa 425, the others from the holotype; all in H). — a and b: Spores. — c: Basidia and basidioles. — d: Tramal hyphae. — e: Section through subiculum. — f: Vertical section of tube dissepiment.

spaced deeper within, (1.8–)2.7–3.7(–4.8)  $\mu\text{m}$ . No clear subhymenium, no cystidia, no cystidioles. Basidia clavate or cylindrical, 16.2–25.5  $\times$  4.8–5.8  $\mu\text{m}$ ; basidioles ellipsoid–cylindrical. Spores slightly thick-walled, broad ellipsoid, CB–, IKI–, 3.8–4.8(–5.2)  $\times$  (2.3–)2.5–3.0(–3.3)  $\mu\text{m}$ ,  $L = 4.22 \mu\text{m}$ ,  $W = 2.71 \mu\text{m}$ ,  $Q' = (1.3–)1.4–1.7(–1.9)$ ,  $Q = 1.56$  ( $n = 150/4$ ), often with one or a few pearl-looking guttules.

We have chosen to place the new species in *Aurantiporus* emphasising such morphological characters as the spore shape, the hyphal construction and the waxy, colourful basidiomes.

Also our preliminary molecular data (O. Miettinen unpubl.) indicate links with *Aurantiporus* species. The new species does not appear to be closely related to the type of *Hapalopilus*, *H. rutilans* with light-weight, cottony basidiomes and a loose hyphal structure.

This species has mostly been confused with *Hapalopilus aurantiacus*. That species and its kin *H. ochraceolateritius* are more intensively

coloured, with warm yellowish and sometimes bright brick-red tints. These two and *A. priscus* are rare and their fresh characteristics are seldom seen. The two *Hapalopilus* species differ in having a strong blood-red colour reaction with KOH on tubes; hyphae in their subiculum are thick-walled with a narrow lumen, patchwise amyloid with bright purple-pink reaction in IKI. Furthermore, their spores are cylindrical, not ellipsoid like in the new species (Table 1).

Thick resupinate specimens of *Leptoporus mollis* resemble *A. priscus* in their shape and colour, but the former species is softer, narrow-spored, clampless and it produces no colour reactions in KOH.

The description of *Poria rubens*, and Lowe's collection in H, partly match with the characters of our species, but the conflicting features are the thinness of the basidiome (1–2 mm), the colour change to dull purplish in older parts and on drying, the tubes changing almost black in KOH ('lavender' according to the description, evi-

**Table 1.** Spore dimensions of *Aurantiporus priscus*. *L* = average of spore length, *W* = average of spore width, *Q'* = length/width ratio of individual spores, *Q* = *L*/*W*, and *n* = number of spores measured. The whole range is given in parentheses; 90% range excluding 5% extreme values from both ends of variation is given without parentheses; in case the values are identical, parentheses are omitted.

Species/specimen	Length	<i>L</i>	Width	<i>W</i>	<i>Q'</i>	<i>Q</i>	<i>n</i>
<i>Aurantiporus priscus</i>	3.8–4.8(–5.2)	4.22	(2.3–)2.5–3.0(–3.3)	2.71	(1.3–)1.4–1.7(–1.9)	1.56	150
Holotype	3.8–4.8(–5.1)	4.14	(2.3–)2.4–3.0(–3.1)	2.71	1.4–1.6(–1.7)	1.53	30
<i>Manninen 3127</i>	3.8–5.0(–5.1)	4.19	2.5–2.9(–3.3)	2.71	(1.3–)1.4–1.8(–1.9)	1.54	30
<i>Niemelä 7082 et al.</i>	3.8–4.8(–5.2)	4.24	(2.3–)2.4–2.9(–3.0)	2.65	(1.4–)1.5–1.7(–1.8)	1.60	60
<i>Vehmaa 425</i>	(3.9–)4.0–4.7(–5.2)	4.30	2.6–3.1	2.85	(1.3–)1.4–1.7	1.51	30

dently of fresh specimen), the narrower (2–2.5  $\mu\text{m}$ ) spores, and the subiculum reported to be almost white when fresh (Overholts & Lowe 1946). *Poria carnicolor* has much longer spores, 5.5–7  $\times$  2–3  $\mu\text{m}$ , and its subiculum and tubes are concolorous (Baxter 1941).

The North American *Hapalopilus mutans* is somewhat similar, but it grows on angiosperms and its spores are larger (4.5–6  $\times$  3–3.5  $\mu\text{m}$ ; Gilbertson & Ryvarden 1986).

### The identity of *Polyporus salmonicolor*

The name *Polyporus salmonicolor* has been interpreted in many ways; often it is considered to be an older name for *Hapalopilus aurantiacus*. The epithet, ‘salmon-coloured’ misled Niemelä (2005) to treat it as the proper name for our new species. The study of the type did not support this. The isotype (K) is in a fairly poor condition, but recognizable anyhow. The tubes have become black because of abundant resinous matter, which is a characteristic of *H. aurantiacus* and even more of *H. ochraceolateritius*. The pores are round, 5–6 per mm. The few spores that we saw were very thin-walled, cylindrical, 4.5–4.9  $\times$  2–2.3  $\mu\text{m}$ , CB–, IKI–. The narrow spore shape and the hyphal characters in the subiculum exclude this species from *A. priscus*: the subicular hyphae are thick-walled, with a narrow lumen ca. 1/3 of the hyphal diameter, and they are clearly amyloid with a purple-pink tint. *Polyporus salmonicolor* clearly belongs to the same group of species with *H. aurantiacus* and *H. ochraceolateritius*, but we should see better-preserved — preferably fresh — material from the area where *P. salmonicolor* was described (South

Carolina, USA) before further conclusions can be made. It might be advisable to refrain from using this name for European taxa, until it becomes convincingly proved whether it is a name applicable for *H. aurantiacus*, *H. ochraceolateritius*, or for a related North American species.

SPECIMENS EXAMINED (on *Pinus sylvestris*, unless otherwise stated). — *Aurantiporus priscus*: **Finland**. Pohjois-Karjala Prov., Ilomantsi, Tapionaho, 20 Sep. 1994 *Junninen 178* (H). Kainuu Prov., Kajaani, Pikku-Talas NW, 3 Oct. 1989 *Penttilä 1507* (H); Kuhmo, Louhivaara, 24 Aug. 1992 *Penttilä 3606* (H), Ulvinsalo Nat. Park, 28 July 1994 *Tolvanen 1074* (H), SW of Särkkjärvi, 19 Sep. 1998 *Manninen 980919-2* (H); Suomussalmi, Sammakkovaara, 29 May 2004 *Miettinen 8548* (H). Koillismaa Prov., Posio, Korouoma Nat. Reserve, 1 Sep. 2001 *Niemelä 7082 & Kulmala, Kinnunen* (H); Taivalkoski, Seitensoppinen, 16 Aug. 1994 *Vehmaa 425* (H). **Poland**. See type. **Sweden**. Norrbotten Prov., Boden, Stasskölen, 24 Aug. 2007 *Manninen 3127* (H). — *Hapalopilus salmonicolor*: **USA** [South Carolina], Santee River, [on burnt pine logs], coll. *H.W. Ravenel 1527* [ex herb. Berkeley], lectotype of *Polyporus salmonicolor* (K), as indicated by Ryvarden (1977: 225). — *Poria rubens*: **USA**. New York, Warrensburg, white pine [*Pinus strobus*], 13 July 1942 *Lowe 2097* (H).

The culture of *Manninen 3127* is stored in the Fungal Biotechnology Culture Collection of the University of Helsinki under the number FBCC 1234.

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checked the host tree of the type material, and Teuvo Ahti revised the manuscript and the Latin description.

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