

Russula pyriodora, a new fragrant species described from Finland.

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A new species, *Russula pyriodora*, is described based on Finnish material. It is characterized by an appearance of *R. betularum*, but has a distinctive odour of pears. Other differentiating features, both macroscopical and microscopical, are also discussed. The new species is also compared with the type of *R. alborosea*, which is a likely synonym of *R. mairei*.

Key words: Russulaceae, *Russula*, *Atropurpurea*, *Russula pyriodora*, Finland, taxonomy

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Introduction

New taxa of the genus *Russula* Pers. are encountered in Finland every year. In most cases these new finds consist of only a few fruitbodies. Furthermore, it is often very laborious to find a second collection, even from the existing, plentiful collections. Consequently, during the past decades the senior author has refrained from describing such finds as new species – not even when more or less convinced about their novelty. In such cases the great overall variability, typical for most species of *Russula*, would not be reported properly. In Finland we know many distinctive species, which are closely related to existing, well known species. Describing these is hindered by the lack of existing type specimens. Furthermore, many of the neo- and epitypifications by Sarnari (1998, 2005), based on Romagnesi's collections, should be checked for the possibility of mixed collections. It is not rare to find out that the neo- and epitypes selected from older collections have been mixed collections, even if only two to three fruitbodies are present. For example in the case of *R. clavipes* Vel., the neo-

typification by Kärcher (1996) is based on two fruitbodies which are not conspecific. Selection of a type without actually carefully studying material is never advisable. For example, descriptions like those by Romagnesi based on “clear” type specimens, are of questionable value when it is realized that those “clear” type collections are mixtures of more than one taxon, e.g. *R. amoenoides* Romagn. and *R. terenopus* Romagn. Hence, comparisons based on literature only, have led to many misunderstandings.

Being aware of the situation mentioned above, descriptions of new species of *Russula*, based on only three collections from two sites in Finland, is seldom advisable. Even in the current clear cut case, where we feel confident enough about the new status of our finds, one could not ignore type studies. Reumaux et al. (1996) described *R. alborosea* Reumaux which he later combined as a variety of *R. betularum* Hora (Reumaux & Moënne-Loccoz 2003). The colours in *R. betularum* are reminiscent of those of *R. pyriodora* but microscopical features are clearly different. The microscopical features given by Reumaux et al. (1996) for both *R. betularum* and *R. alborosea*

demanded type study of the latter species. In the extreme south-western part of Finland one can possibly find a taxon of a similar appearance to our new species, namely *R. minutula* Vel. But it seems that the new species is a well-characterized, by its odour. The clear odour of pears was verified by several mycologists for the whole material.

Materials and methods

The specimens were studied with Leitz Laborlux 10 and characters drawn using a drawing apparatus. Spores were observed and measured using $\times 1250$ magnification from preparations made from gills in Melzer's Reagent (MLZ), Q-values were measured from a spore print. Elements of the cap cuticle were studied in water, Congo red (CR) and Carbol Fuchsin using $\times 600$ magnification. They are illustrated from preparations in CR.

Russula pyriodora Ruots., sp. nova –

Figs. 1, 2, 4

Mycobank no.: MB563454

E speciebus aliis Russulorum odore pyri differt.

Typus: Finland. Kainuu. Paltamo, Tololanmäki, Kylmänpuro Nature Protection Area, Grid 27 °E 713875:355055, 21.VIII.2011 *Mauri Lahti & Juhani Ruotsalainen, JR.8415F* (KUO – holotypus; TUR – isotypus).

The new species is a small, apparently rare, look-alike of *Russula betularum*, differing in the clear pear odour and slightly sharp taste. *Cap* 1.8–5.5 cm diam, pale pink or rose colour when young, silky glossy, convex, becoming more flattened and matt when older, with paler patches due to age and dryness, umbo small and darker, margin smooth when young, later moderately but clearly sulcate. *Lamellae* straight, seceding, moderately spaced when young, greyish white when fresh, becoming yellowish white when more dry, rather distant when older, greyish white, ochraceous grey-white when more dry, lamellulae scanty. *Stem* longer than the cap diameter, 4–6 \times 0.6–1.3 (–1.8) cm, at first cylindrical to slightly clavate, later widest in the middle, widening also at apex, greyish white or with a red hue, sometimes more clearly rosy red for the whole length, surface not totally smooth when old, tapering at the

base especially when old. *Context* thin, fragile, greyish white, spongy in stem. *Taste* peculiarly unpleasant, oily and sweetish, slightly sharp in gills but not burning. *Odour* clear, sweet, pear-like, like that of *Inocybe corydalina*. *Spore-print* almost white, in Romagnesi's scale 1.a(–b), in Dagron's scale 1(–2). *Spores* 8.2–9.6(–10.5) \times (7–)7.2–7.8(–8.2) μm , mean 9.0 \times 7.6 μm , mean Q= 1.19, broadly ellipsoid to obovate-ellipsoid; in a squash mount the ornamentation is variable, with warts, groups of warts or short crests, with hardly any connectives, warts mostly rounded, pointed warts rare; in a spore-print, spores are larger and warts are more spaced, pointed warts rare, up to 1.0 μm high; plage small, partially amyloid with tiny warts or often only surrounded by a weakly amyloid zone. *Basidia* 34–36 \times 10–12 μm , four-spored, short, clavate. *Cheilocystidia* ca 85 \times 8.5–10.0 μm , abundant, fusiform with a long, tapering apex, often with a small appendix, contents bright or minutely granulose (in MLZ). *Cuticle* (in CR) with abundant dermatocystidia, either in small bunches (in Kainuu collections) and narrowly clavate, 6–8 μm wide, 0–2-septate, exceptionally non-variable; or (in Nilsjö collection) scattered, longer, almost cylindrical – narrowly clavate, rather non-variable. Epicutis hyphae narrow, 2.0–2.8 μm diam, cylindrical, the broadest narrowly clavate, septal intervals relatively long, contents not granulose.

Ecology and distribution

Russula pyriodora has so far been found from two sites in Finland. Both Paltamo (Kainuu) and Nilsjö (Pohjois-Savo), collection sites were nutrient-rich brook ravines with some influence of limestone. The holotype originates from a wet, wooded mire with a mosaic of tussocks of grasses and herb-rich areas. The main tree genus is *Betula*, together with *Alnus*, *Salix* and *Picea* (Fig. 3). In Nilsjö the site is dominated with large spruces, together with *Betula*, *Alnus* and *Salix*. It is hard to be sure about the host tree species; most likely it is *Betula*. On the other hand, the senior author has collected *R. betularum* from *Betula*-free plantations of spruce. However, these sites have not been as moist and nutrient rich as those where *R. pyriodora* has been found. Demanding species of fungi found nearby include *Russula atroglauca* Einhell., *R. cremeoavellanea* Singer, *R. nauseosa*

(Pers.) Fr., *R. olivina* Ruots. & Vauras, *Inocybe maculata* Boud. and *Lactarius olivinus* Kytöv.

Paratypes: **FINLAND. Pohjois-Savo.** Nilsjä, Palokangas, Loutteispuro Nature Protection Area, Grid 27° E 710282:355214, 09.IX.2010 *Ruotsalainen*, JR. 8291 (KUO). **Kainuu.** Paltamo, Tololanmäki, Kylmänpuro Nature Protection Area (= type locality), Grid 27° E 713875:355055, 16.VIII.2010 *Ruotsalainen*, JR.8128F (KUO).

Specimens studied for comparison: (*R. alborosea*) **FRANCE. Ardennes.** Bois de Toges, 21.IX.1994 Reumaux R.63c (G, isotype). – (*Russula betularum*) **FINLAND. Pohjois-Savo.** Kuopio, Vehmersalmi, Kulhua, N of Suurjärvi, Grid 27° E 69525:35511-2, 09.VIII.1989 *Ruotsalainen*, JR.1394F (KUO). – (*R. mairei*) **SWEDEN. Småland.** Färgaryd, Hyltebryg, *Fagus* forest, 17.IX.1987 *Ruotsalainen* JR.757 (Herb. JR); Femsjö, SW side of Södra Färgen, *Fagus* forest, 17.IX.1987 *Ruotsalainen* JR.763F (Herb. JR). **ITALY. Veneto.** Belluno, Trichiana, Col di Pera, *Fagus* forest, 20.VII.2001 *Alpago-Novello*, Vauras & *Ruotsalainen*, JR.5702 (Herb. JR); Melere, Ongia, *Fagus* forest, 30.IX.2002 *Ruotsalainen* JR.6189 (Herb. JR); Limana, Valmorel, 27.VII.2006 *Alpago-Novello*, Vauras & *Ruotsalainen*, JR.7558 (Herb. JR).

Results and discussion

In its present known distribution area, *R. pyriodora* has only one similar looking species, namely *R. betularum*. They are in the same size group and their overall pileus colouring is almost identical. The whiter gills and lack of red hues on the stem in *R. betularum* are good field characters. *Russula pyriodora* often has either red colouring or at least red hues on the stem. When fresh fruitbodies are available, taste and odour are also clear separating features, because *R. betularum* has a clearly sharper taste and a very weak, fruity odour. Microscopical features also differ. The new species does not have spores with the strong, well developed network so characteristic of *R. betularum*. The dermatocystidia also bear differences; in *R. betularum* they are more variable ranging from shorter to broader and longer/narrower and they also are apically irregular in outline (Fig. 5).

Russula minutula has recently been discovered in southwestern Finland. It is a similar-looking, very rare mild species with white spore-print, which has only been found under broad-leaved trees in Ruissalo, Turku town. It belongs to subsection *Roseinae* due to the incrusted cuticular hyphae. Judging from the de-

scription and illustrated spores, *R. alborosea* also needed to be taken into account (Reumaux et al. 1996: 69, 74, 105, 122, 281). It has been collected under *Fagus* but the description seems to point to *R. betularum*. A study of the isotype revealed spores which are different from those of *R. pyriodora* but which, on the other hand, do not match those illustrated by Reumaux et al. (1996: 105) as part of the diagnosis. As the spores reminded the senior author about *R. mairei* Sing., the microscopical features of the type of *R. alborosea* re-examined by the senior author are given below (cf. also Fig. 6). Spores measured $7.8\text{--}9.0 \times 6.0\text{--}6.8\ \mu\text{m}$ and were mostly shortly ellipsoid with a small, slightly amyloid plage. Possibly many of the spores in the type are not fully mature because the biggest spores have a thinner reticulum compared to that of the smaller, more clearly amyloid spores, that also had larger warts. Compared to our material of *R. mairei*, these smaller and darker spores (more mature) were identical. Since *Fagus* is not native to Finland, we unfortunately still have too scanty knowledge on the variability of *R. mairei*. The original diagnosis of *R. betularum* (Hora 1960) suggests that Reumaux et al. (1996) had a deviating view of *R. betularum* sensu auct. Hence, we consider *R. alborosea* as a synonym of *R. mairei*.

The classification below generic level in *Russula* varies greatly between different authors (e.g. Romagnesi 1967, Sarnari 1998). Because *R. pyriodora* and *R. betularum* are macroscopically close, small, white-spored and more or less sharp species, they should be placed to the same group (“serie”). We follow Sarnari’s idea of subsection *Russula* to which he created “serie” *Atropurpurea*, which seems to be the most logical placement for our new species.





Fig. 1. (left up) *Russula pyriodora* in situ, Paltamo, Kylmänpuro, 2011 Lahti & Ruotsalainen (holotype). Photo: J. Ruotsalainen

Fig. 2. (left down) *Russula pyriodora* in situ, Paltamo, Kylmänpuro, 2010 Ruotsalainen (paratype), somewhat dry fruitbodies. Photo: J. Ruotsalainen

Fig. 3. (right up) Kylmänpuro, habitat of the holotype, 20.VIII.2010. Photo: J. Ruotsalainen

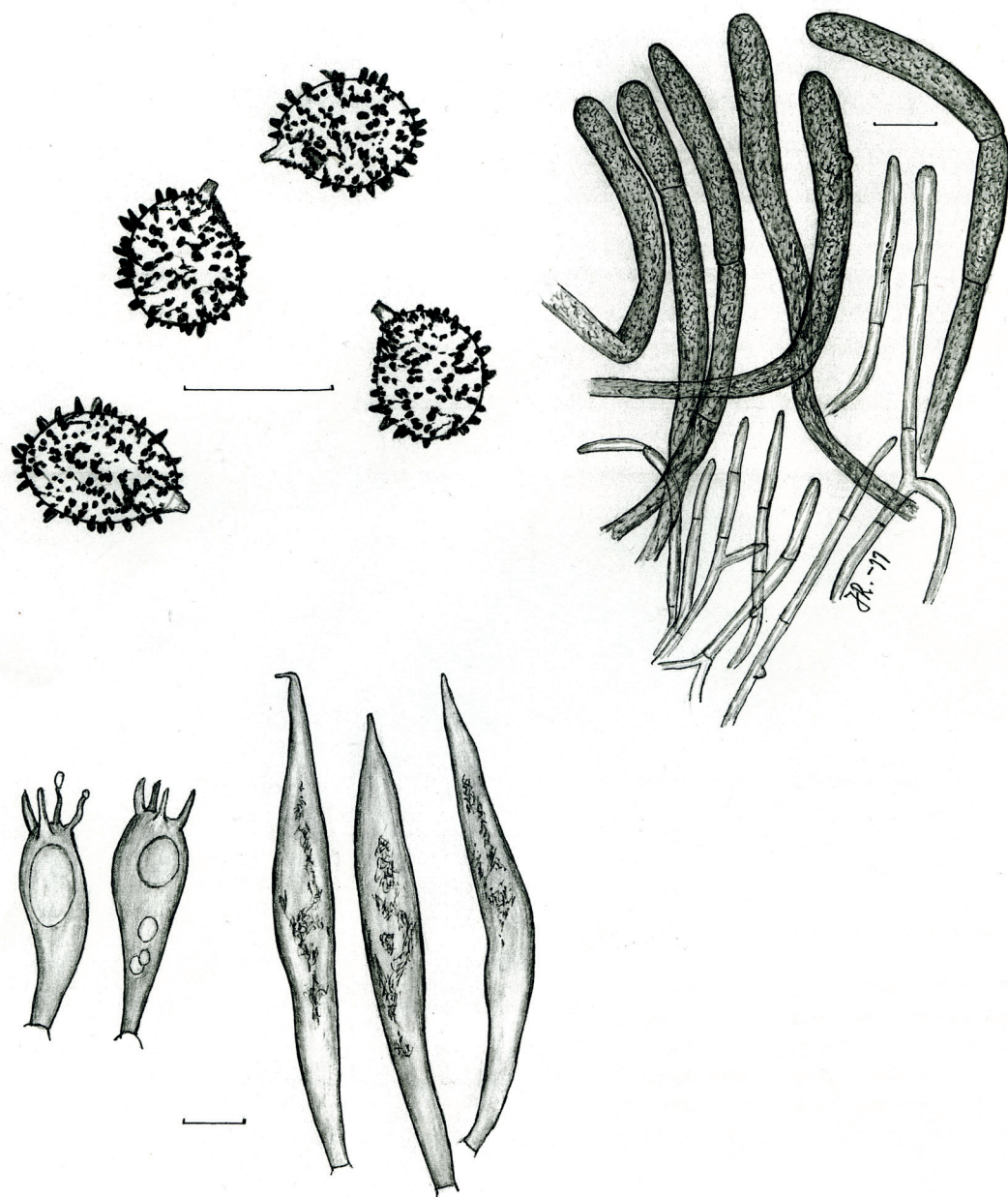


Fig. 4. *Russula pyriodora* (paratype, Ruotsalainen, JR.8128F). Spores, basidia and elements of the pileipellis. Bars: 10 μ m.

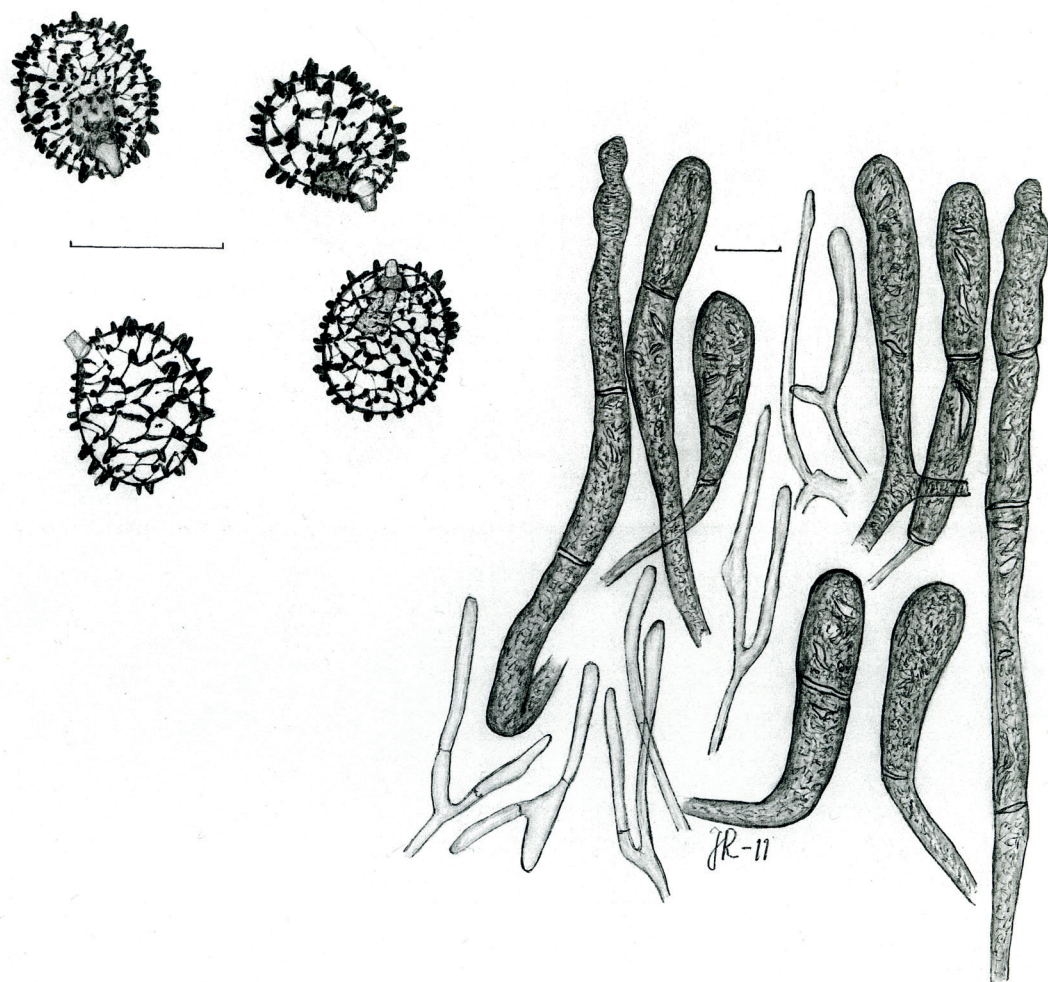


Fig. 5. *Russula betularum* (Ruotsalainen, JR1394F). Spores and elements of the pileipellis. Bars: 10 μ m.

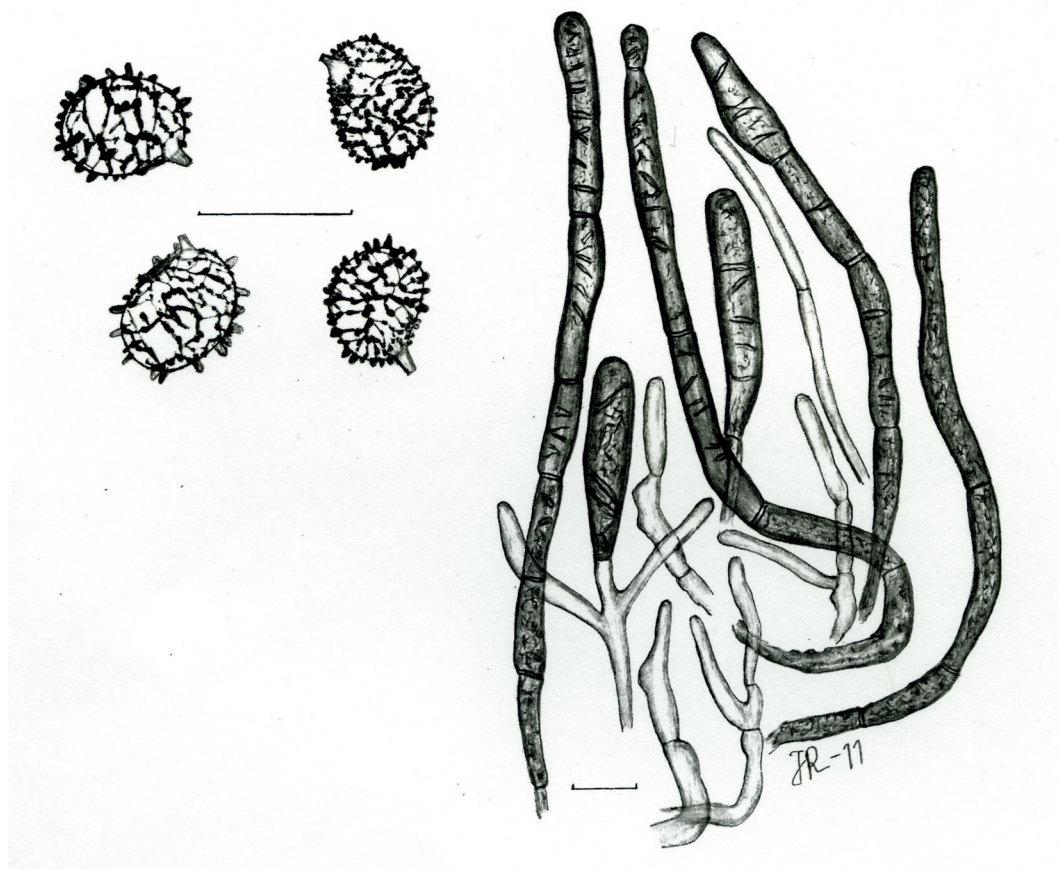


Fig. 6. *Russula alborosea* (isotype, Reumaux R 63c). Spores and elements of the pileipellis. Bars: 10 μ m.

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