

Lactarius mairei and its occurrence in The Netherlands

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Abstract

Two records of *Lactarius mairei* in The Netherlands led the author to describe again this species extremely rare for Europe and to discuss its habitat. A comparison of the descriptions of this species published so far does not support the view to consider *L. pearsonii* as a separate species.

Introduction

Malençon (1939) described *L. mairei* on account of two finds in Marocco (1937). In Europe this species has since been found occasionally: first in England, where Pearson (1950, 1952) distinguished var. *zonatus* mainly because of the zonation of the cap. In Czechoslovakia, where this species is reported not to be so very rare, Pouzar (1954) and Schaefer (1968) have discussed it; the latter divided the species in two by distinguishing it from *L. pearsonii*. Neuhoﬀ (1956) in his monograph (p. 101) had already pointed out that this name would be suitable for the fungus described by Pouzar if it would indeed appear to be a separate species. (Pouzar had classed his specimens in *L. aurantiaco-ochraceus* Vasiljeva, a species described for East Siberia, but found under birches, and for this reason, according to Neuhoﬀ and Schaefer they should not be considered as such.) It might be of interest to give once more a detailed description of this rare species and to discuss the question whether is it reasonable to distinguish two species in this case.

Materials and methods

On August 29, 1962, in the Niënhof at Zeist we found a fine vegetation of the zoned form; on September 2, 1967, in two places on the estates of Neerijnen near Waardenburg we came upon specimens of the zoneless form. We were able to compare the material gathered by us with the specimens found at about the same time (Sept. 6, 1967) in England (Philliswood near Marden, Sussex), which were placed at our disposal by Dr. E. Kits van Waveren.

Below we chiefly describe the specimens occurring in the collection of 2 Sept. 1967; the characteristics of the zoned samples of 1962 in so far they differ, are placed between square brackets in the text. Sections of exsiccata and spores were swollen first by heating with 10% NH_4OH and spores were studied in Melzer's reagent; cutis and hymenium, after swelling, were investigated mostly in sulphovanilline (SV).

	Malençon (1939)	Pearson (1952) <i>L. mairei</i> var. <i>zonatus</i>	Pouzar (1954) <i>L. aurantiaco-ochraceus</i>
Dimension of cap	—11 cm	5–6 cm	6–10 cm
Colour of cap	tawny rufous-orange	dark orange buff	ochraceous-orange
Zoned or not	—	+	+
Margin of cap, scales	at first incurved hairy	incurved reddish-brown	not strongly incurved orange-brown
Distance of gills	crowded	crowded	not very crowded
Colour of gills	light coloured beige	pale orange buff	ochraceous
Dimensions of stipe	60–65/15 (at the top more)	40–60/10–15	30–70/13–15(25)
Colour of stem	ochraceous-yellow	orange buff	pale ochraceous-orange
Cavity in stem	+ (older)	solid, spongy	+
Smell	strong, fruit-like somewhat nauseate	strong and pleasant	like leaves of morello
Milk acrid, white	unchangeable	unchangeable	when dry turning slightly grey on gills like butter
Colour of spore print (Crawshay)	?	D	
Dimensions of spores	8–8.5/7 μ	7–7.5/6.5–7	(7)7.7–8.5(9.6)
network of thick lines			5.8–6.4
Dimensions of pleurocystidia	110–130/11–12 μ	long and pointed	?
Dimensions of cheilocystidia	?	?	?
Habitat	under <i>Quercus faginea</i>	probably under oaks	in woods with <i>Salix fragilis</i> , <i>Fraxinus excelsior</i> , <i>Quercus sessilis</i> (= <i>Q. petraea</i>) wet places near brooklets

Description

Lactarius mairei (Malençon, 1939, Ic. 1. c. Pl. 1; Pearson, 1952, Pl. 3 fig. 6).

Cap: up to 11 cm in diameter ($m = 7$ –8 cm), in young specimens flat already [with incurved margin], afterwards flat funnel-shaped, top view circular, margin thin; light ochraceous buff (centre)-ochraceous-orange (Ridgway XV-15'd-15'b-15') [more ochraceous-orange], lighter toward the edge, zoneless or with slight zonation [with distinctly darker zones], inner half with innate fibres, the outer half fibrous, hairy to scaly, scales made up of fibres inclining at the top (and therefore triangular) and soon dark coloured: Kaiser Brown-Carob Brown (Ridgway XIV-9' k,m), scales seem to be

Schaefer (1968) <i>L. mairei</i>	Reijnders (1962) Niënhof	Reijnders (1967) Neerijnen	Kits van Waveren (1967) Philliswood
—12 cm yellow like hay — only vaulted brown very crowded cream-ochraceous- rusty 40–120/20 cream + (older) not particular, not disagreeable unchangeable B	—11 cm bright yellow- orange + at first incurved dark coloured very crowded cream-yellow with pinkish component long and stout yellow-orange + ? unchangeable D	—11 cm, m = 7–8 cm ochraceous buff- ochraceous-orange sometimes slightly not strongly incurved dark coloured very crowded cream-yellow somewhat pinkish weak 35–40/7–14 paler than cap — strong, fruit-like not disagreeable when dry turning slightly grey B–C	—9.5 cm like carrots, yellow- ochraceous-orange — incurved dark coloured very crowded ? 45–70/10–17 dirty white- orange-brown cavity narrow stem spongy strong, sweet Pelargonium unchangeable D
$5.5-8.5/5-7$ $m = \frac{7}{6}$ not numerous protruding —20 ? in wood of <i>Quercus</i> <i>pubescens</i> with <i>Crataegus oxyacantha</i>	$(6.5)7-8(8.5)$ $m_{25} = \frac{7.5}{6.2}$ $(5.5)6-7(8)$ numerous 48–112/6.5–10 35–64/6.5–8 under <i>Quercus robur</i> on river-loam	$6-7.5(8.5)$ $m_{30} = \frac{7.2}{6.2}$ 6–6.5 numerous 54–74/6.5–10 40–60(67)/6.5–10 under <i>Quercus robur</i> on river-loam	$(6)6.5-7.5$ $m_{30} = \frac{7}{5.8}$ $(4.5)5-6(6.5)$ numerous 48–80/8–11 30–64/6.5–11 under <i>Quercus (robur?)</i> on clay

in circles, are often more erect than on the plate of Malençon, margin of cap hairy.
Gills: highly numerous (55–88 primary gills), in some cases connected fork-like or vein-like, secondary gills differ in length, 4–5 mm high, with thin edge; light ochraceous buff-salmon buff (Ridgway XV-15'd, XIV-11'd).
Stem: short, narrow at foot, widening at the top 35–40/7–14, [longer and broader, slightly broadening at the top], sometimes rooting; lighter than the cap [same colour as cap]; solid [afterwards hollow]; flaky, afterwards smooth.
Flesh: white, turning rosy when exposed to air (under the cutis and cortex), smell strong, fruit-like with characteristic component; taste strong, congenial to the smell.
Milk: white, acrid-highly acrid, when drying sometimes turning light-grey.

Sporeprint: cream-like, C [D] (Crawshaw).

Reactions: KOH 40%: yellow-dark grey-brown, milk negative.

NH₄OH: negative.

FeSO₄: slowly greyish.

Tinctura guajaci: gills and flesh blue-green.

Microscopic characteristics: *spores*: short elliptical, sometimes nearly round, with greatly pronounced network and wide crests (protruding 0.5–1.5 μ), isolated protuberances rare, 6.5–7.5(8.5)/6–6.5 μ , $m_{30} = 7.2/6.2 \mu$

[(6.5)7–8(8.5)/(5.5)6–7(8) μ , $m_{25} = 7.5/6.2 \mu$]

Ripe basidia: 34–45/10–12 μ

Pleurocystidia: spindle-shaped, long, far protruding, strongly colouring in SV, sometimes divided by a septum, 54–74/6.5–10 μ , protruding $\pm 32 \mu$ [48–90(112)/6.5–10 μ , protruding $\pm 30 \mu$.]

Cheilocystidia: shorter, often very numerous, edge of the gills subheteromorphous, often less colouring in SV, 40–60(67)/6.5–10 μ , protruding 24–32 μ , [35–64/6.5–8 μ , protruding 20–30 μ .]

Cutis: In the middle made up of entangled hyphae 3–8 μ wide, without clamps, pigment dissolved in the cell sap, here and there also hyphae with incrustations on the cell wall; fibres consist of bundles of parallel hyphae (3–7.5 μ wide); fibres of hairy scales consist of collapsed cells (with incrustations here and there); in SV the scales turn even more dark: the fibres contain many laticiferous tubes (diameter -12 μ , their contents have granules that turn blue in SV, as do the incrustations in the wall, whereas the other hyphae turn wine-red).

Cortex of the stipe: with a dense tangle of laticiferous tubes which turn blue in SV (diameter -13 μ).

Discussion

Microscopically the species is best recognizable by the dark, hairy scales on the outer fourth part of the cap. Under the microscope it is revealed to be characterized still better through the roundish spores (the difference between length and width is about 1 μ , except in Pouzar) and by the strongly developed network on the spores (Malençon, 1939, p.38). The latter also mentions the large cystidia, but our measurements were considerably less. However, the pleurocystidia were always larger than the cheilocystidia. In the literature comparisons can be found with *L. torminosus*, *L. pubescens*, *L. zonarius*, etc. (Malençon, 1939; Pearson 1952).

As for the habitat it is remarkable that nearly all authors (even Pouzar who has reported the most unusual habitat) have mentioned the presence of oaks. We are therefore of opinion that a mycorrhiza with different kinds of oaks is not unlikely. Schaefer (1968; Pouzar?) believe that *L. pearsonii* can also occur together with other deciduous trees. Pouzar reports calcareous soil, while our river-clay too yields a fairly high pH and is sometimes highly calciferous. Also mention is made of thermophilism, and considering the fact that in our climate the species fructifies but little, this characteristic too may be present.

Finally there is the question whether we are dealing here with two species. To avoid complicated discussions on this point we have drawn up the table in which all characteristics noted down by the authors and leading to this opinion, have been collected.

The personal expression of these authors should therefore be taken into account.

Table 1 shows that: size, colour, zonation and incurvation of the cap, size of the stipe and its cavity, density of the gills, colour of the sporeprints, dimensions of the spores, size of the cystidia and possibly also the smell are subject to variation.

However, the essential point is whether there are a number of *distinct correlative points of difference* between two types. We were not able to find such a series of characteristics, not even a few that could be clearly correlated. At best there might be some correlation between the zonation, the colour of the cap, and possibly the colour of the sporeprint, but our table does not explicitly illustrate this, and the light zonation of some specimens of our findings in 1967, which certainly belong to the type *mairei*, is in contradiction with it. Babos (1959) stated also that the zoned and the zoneless form are growing in Hungary side by side.

It may be that in Czechoslovakia two types occur, but in broader outline we think that it is not yet justified to distinguish a separate *L. pearsonii*.

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Samenvatting

Voorkomen van Lactarius mairei in Nederland

Naar aanleiding van twee vondsten van *Lactarius mairei* in Nederland wordt deze soort beschreven. De voornaamste gegevens van eerdere beschrijvingen worden in Tabel 1 samengevat. Er worden enige opmerkingen over de standplaats gemaakt. De vraag of het juist is een aparte soort *L. pearsonii* te onderscheiden wordt op grond van de vergelijking der literatuur ontkennend beantwoord.

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