Some species of *Laccaria* from India

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Summary. – Four species and two varieties of the genus *Laccaria* (viz. *L. amethystea* (BULL.) MURRILL, *L. laccata* var. *pallidifolia* (PECK) PECK, *L. laccata* var. *pruinosipes* VELLINGA, *L. olivaceogrisea* VELLINGA, and *L. pumila* FAY.) are recorded from north-western states of India. *Laccaria olivaceogrisea* and *L. laccata* var. *pruinosipes* are described as new.

Introduction

On a collecting trip in the federal states Uttar Pradesh, Himachal Pradesh and Punjab in north-west India, during August and September 1964, Dr. C. BAS collected, among representatives of other genera, 4 species of *Laccaria*, in all 10 collections. Up to this time little is known about the occurrence of *Laccaria*-species in the Indian subcontinent as a whole. *Laccaria laccata* (SCOP.: FR.) B. & BR. has been recorded from Tamilnadu (NATARAJAN, 1977) and from Uttar Pradesh and Sikkim (BUTLER & BISBY, 1931). But WATLING & GREGORY (1980) mention no *Laccaria*-species from Kashmir in their list of 119 species of Agarics collected there. BERKELEY & BROOME (1871) give a list of 6 taxa occurring on Sri Lanka, but according to MUELLER (1982) the species *L. sublaccata* (B. & BR.) COOKE and *L. porphyrodes* (B. & BR.) COOKE do not belong to the genus *Laccaria* on account of their smooth spores. Furthermore, it is doubtful if *L. spodophora* (B. & BR.) COOKE is a *Laccaria*, and as BERKELEY & BROOME mention the spores of *Agaricus vinosofuscus* B. & BR. as resembling those of *A. porphyrodes*, it is also doubtful whether this taxon belongs to *Laccaria* or not. Consequently, *L. laccata* and *L. amethystea* (BULL.) MURRIL are the only species of *Laccaria* thus far known from the mountainous areas of Sri Lanka.

Annotated list of species

1. *Laccaria olivaceogrisea* VELLINGA, sp. nov. – Fig. 1.2

Pileus 9–32 mm, plano-convexus, depressus in centro, hygrophanus, udo subolivaceo-fuligineus, amethysteo-fuligineus, cum margine striato, sicco subolivaceo-fulvus, ochraceo-brunneus in centro, subtomentosus interdumque subfloccoso-tomentosus in centro. Lamellae distantiae, crassae, subemarginato-adnatae, subolivaceo-griseae demum subviolaceo-griseae, intervenosae, albo-farinosae in maturitate; acies concolor integer. Stipes 23–46 × 2.5–6 mm, fistulosus, fibrilloso-subcos-

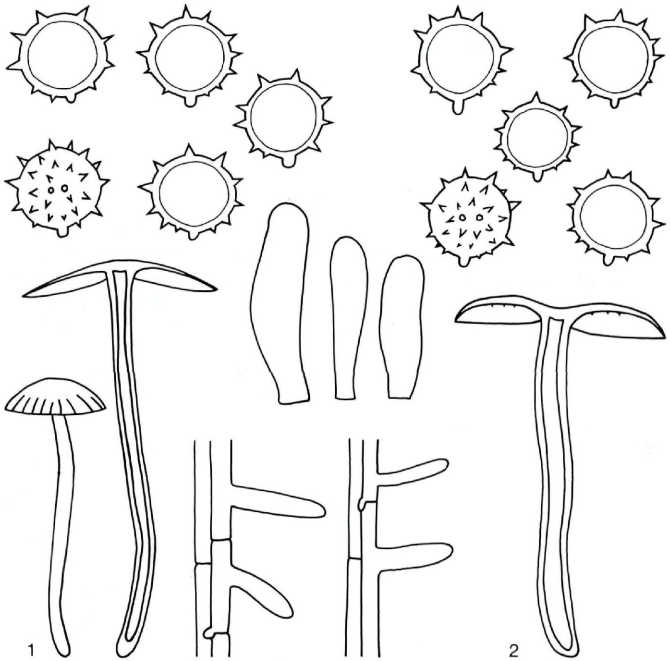

Fig. 1.1: *Laccaria laccata* var. *pruinosipes*. – Habit (× 1); spores (× 1500), cheilocystidia (× 1000) and hairs of stipe (× 500) (all figs. from holotype). – 1.2: *Laccaria olivaceogrisea*. – Habit (× 1), spores (× 1500) (all figs. from holotype).

tatus, subolivaceo-fuligineus atque porphyro-griseus; tomentum basale album. Caro in pileo corticeque stipitis pallide grisea, in stipite pallide roseo-grisea. Odor mitis aromaticus, acidulus fracto. Sporae in cumulo albae, (7.5–)8–9 µm, globosae, cum spinis 1–2.5 µm longis. Basidia cum 4 sterigmatis. Cystidia absentia. Fibulae presentes. Habitat ad terram in silva Cedrorum deodara. India. BAS 4233 (Holotypus, L).

Pileus 9–32 mm, plano-convex with depressed centre, hygrophanous, when moist slightly olivaceous grey, in places amethyst grey, translucently striate at margin, on drying pallescent to slightly olivaceous beige, with dingy ochraceous brownish tinge at centre, minutely tomentose, sometimes very slightly floccose-tomentose near centre. – Lamellae distant, (L 12–20, l 0–3) thick slightly emarginately adnate, strongly intervenose, grey with faint olivaceous tinge to grey with faint violaceous tinge, white powdery with

age, with concolorous even edge. – Stipe 23–45 × 2.5–6 mm, somewhat tapering towards apex, fistulose, strongly fibrillose to subcostate, dark grey with very faint olivaceous tinge, pale porphyr-grey between fibrillose ribs, with thin white tomentum at base. – Context in pileus and cortex of stipe pale grey, dark grey over lamellae, in rest of stipe distinctly flesh pinkish grey. – Smell weakly sweet aromatic, ± chocolate-like, but acidulous when context crushed. – Taste not known.

Spore print white. Spores (20,2) 7.5–9 × (7.5–)8–9(–9.5) µm, Q = 0.9–1.05, $\bar{Q}$ = 1.0, globose, with up to 2.5 µm high prominent spines, diminishing in height towards prominent truncate up to 2 µm high hilar appendage, thick-walled. – Basidia 39–47 × 10–11 µm, narrowly clavate, 4-spored. – Cystidia absent. – Hyphae of hymenophoral trama 5–10 µm wide, pale greenish brown in NH_4OH. – Pileipellis a cutis with some ascending hyphae, made up of 3–6 µm wide hyphae with in NH_4OH yellowish greenish brown pigment. – Stipitipellis a cutis without hairs or cystidia. – Clamp connections present.

Habitat. – Terrestrial in forest of *Cedrus deodara;* ± 2200 m. alt.

Collection examined. – India: Punjab, Kulu-valley, Manali, 24 Aug. 1964, Bas 4233 (holotype, L).

This species resembles the grey and dark grey Japanese species *Laccaria murina* Hongo and *L. nigra* Hongo, but in these species olivaceous and violaceous tinges are lacking; besides, *L. nigra* has two-spored basidia (Mueller, 1982). *Laccaria violaceonigra* G. Stevenson, from New Zealand, has a fuscous black pileus in combination with a purple to vinaceous brown stipe; also in this species olivaceous tinges are lacking; microscopically, *L. olivaceogrisea* and *L. violaceonigra* resemble each other, especially in shape and size of the spores.

It is striking that the variation in colour of *Laccaria*-taxa is bigger in Asia (India, Japan) and New Zealand than in Europe, North and South America, where only brown and violaceous tinges occur in the representatives of the genus.

In *Cortinarius* subgen. *Dermocybe,* the highest regional heterogenity of pigments is found in New Zealand (Høiland, 1983), an indication for the place where to suspect the cradle of this group. It is tempting to speculate about the place of origin of the genus *Laccaria* too, but it is not likely that *Laccaria* originated also in Gondwanaland, like *Dermocybe,* as the present day occurrence of the greyish coloured species in Japan and North India, the southern and eastern borders of the formerly called continent Laurasia does not support this theory. But of course, more data concerning the

species in Australia, and the chemical structure of the pigments and the way in which they are formed are needed. However, it seems likely that in the European and American temperate regions some brown tinged species and variants have evolved, in connection with different tree-species. Some taxa, *L. proxima* for instance, now growing in New Zealand, seem to have been introduced as they are found exclusively with exotic tree-species (McNabb, 1972).

2. *Laccaria laccata* var. *pruinosipes* Vellinga, var. nov. – Fig. 1.1

Differt a typo in stipite omnino longitudine pruinoso et in sporis globosis. India. Bas 4403 (Holotypus, L).

Pileus 7–23 mm, convex to applanate, with applanate to slightly depressed centre, and margin becoming wavy with age, rather dark flesh-coloured brown, traslucently striate up to ⅔ of radius, later becoming subsulcate, glabrous. – Lamellae rather distant, (L 12–16, l–3) rather thick, adnate, uncinate, emarginate or adnexed, flesh pink to flesh coloured red with entire somewhat whitish pruinose edge. – Stipe up to 55 × 2.5 mm, cylindrical or slightly broadened towards base, fistulose, very pale ochraceous cream, sometimes slightly pinkish at apex, minutely pruinose all over. – Context in pileus pinkish buff, in stipe concolorous with surface. – Smell acidulously spicy when crushed. – Taste slightly unpleasant. – Spore print white. – Spores (20.2)(7.5–)8–9(–10.5) × (7.5–)8–10(–11) µm, Q = 0.9–1, $\bar{Q}$ = 0.95, globose, with up to 2 µm high spines, with up to 1 µm high abrupt truncate hilar appendage, thick-walled. – Basidia 4-spored. – Cheilocystidia cylindrical, 22–32 × 6–9 µm, colourless. – Pileipellis a cutis of adnate hyphae. – Stipitipellis a cutis with patent cylindrical parts of hyphae, up to 50 × 5–10 µm, colourless. – Clamp connections present.

Habitat. – Terrestrial in forest of *Quercus incana;* ± 2300 m. alt.

Collection examined. – India: Uttar Pradesh, Mussooree, Oak-Villa, 16 Sept. 1964, Bas 4403 (holotype, L).

This variety is striking on account of the stipe being completely covered with short hairs. In some other species, viz. *Laccaria proxima, L. bicolor,* and *L. amethystea,* this kind of covering appears at the apex of the stipe only. In the other varieties of *L. laccata,* viz. var. *laccata,* var. *pallidifolia,* and var. *moelleri,* the apex of the stipe is very rarely covered with hairs.

3. *Laccaria laccata* var. *pallidifolia* (Peck) Peck

A comprehensive description of this taxon is given by Mueller & Vellinga (1986).

Habitat. – Terrestrial in plantations of coniferous trees, in deciduous forests and in mixed forests; 600–2750 m. alt.

Collections examined. – INDIA: Himachal Pradesh, Narkanda, 11 Aug. 1964, BAS 4134 & 4135; Uttar Pradesh, Rajspur, North of Dehra Dun, 4 Sept. 1964, BAS 4282; Uttar Pradesh, Dehra Dun, New Forest, 5 Sept. 1964, BAS 4289; Uttar Pradesh, Mussooree, 18 Sept. 1964, BAS 4427 (all in L).

4. *Laccaria amethystea* (BULL.) MURRILL

The Indian collections studied are not aberrant from the European collections. For a description of the microsopical characters of this taxon see MUELLER & VELLINGA (1986).

Habitat. – Terrestrial in rocky pastures with scattered coniferous trees or in mixed forest of *Quercus incana, Rhododendron arboreum,* and *Cedrus deodara;* ± 1900–2100 m. alt.

Collections examined. – INDIA: Punjab, Kulu-valley, Manali, 23 Aug. 1964, BAS 4213; Uttar Pradesh, Mussooree, 21 Sept. 1964, BAS 4456 (both in L).

5. *Laccaria pumila* FAY.

A description of this taxon with montane to alpine distribution is given by TRIMBACH (1978). The characters of the Indian collection studied fit this description very well.

Habitat. – Terrestrial in herbaceous vegetation; ± 2800 m. alt.

Collection examined. – INDIA: Punjab, Kulu-valley, Kothi, 22 Aug. 1964, BAS 4212 (L).

Notes on the correct name of this taxon have been published by MUELLER & VELLINGA (1986).

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