

Tomentella asperula

Figures 1–13

Hypochnus asperulus P. Karst. 1889 [4 : 441] (H!) ≡ *Tomentella asperula* (P. Karst.) Höhn. & Litsch. 1906 [3 : 1570]

= *Tomentella gibbosa* Litsch. 1933 [8 : 70] (W!)

= *Tomentella griseocinnamomea* Wakef. 1966 [10 : 358] (K(M)!)

Basidiome effused, loosely adherent to separable or, in part, completely detached from substratum, up to 0.5 (1) mm thick.

Hymenophore smooth to strongly colliculose, compact, becoming somewhat crustose when old. Colliculi spaced to crowded and concrescent, 1–4 (7) per mm, 0.1–0.2 mm across, easy peeled off from the subiculum.

Hymenial surface continuous, when fresh brownish, grey brown, green brown to (very) dark green-grey brown, fading on drying to light brown, light grey brown, light olive brown, brownish or olivaceous brown, evidently darker than the subiculum.

Subhymenium thickening, tomentose or felted, englobing numerous spores and (by this) more or less concolorous with the hymenial surface.

Subiculum and context hypochnoid to tomentose or fibrous, poorly developed to thick, whitish or very pale yellowish-brown, usually with numerous rhizomorphs.

Margin fertile throughout and indistinct to sterile and wide, thinning out and araneose to byssoid or fimbriate, whitish to light yellowish, normally turning yellowish or light grey when dry.

Rhizomorphs infrequent to common in subiculum, finally building up a conspicuous part of the subicular layer; sometimes easily seen at the margin and in cracks of the substratum, up to 0.1 (0.2) mm in diam., sometimes fasciculate and up to 0.5 mm wide, irregularly intertwined and richly branched to fan-shaped, soft, cottony, flexible, not fragile; surface pubescent, with numerous projecting hyphae; normally white, sometimes light grey, very pale brown, pale yellowish brown.

Hyphal system monomitic or dimitic with skeletal hyphae associated with rhizomorphs.

Subhymenial hyphae almost regular, fibulate, (2) 2.5–4 (5) μm , short-celled, frequently branched from clamps, thin-walled, hyaline or subhyaline, loose and vertically arranged when hymenial surface is smooth, compact, often collapsed and with radiating orientation inside colliculi.

Subicular hyphae of one or two kinds: **1**) generative fibulate, regular, (2) 2.5–6 (7) μm , with thin or thickening wall or even solid wall (up to 2.5 μm) with lumen often difficult to observe, rarely with localized thickenings, hyaline to subhyaline or slightly yellowish, sometimes with short, simple anastomoses, horizontally oriented, at the base of colliculi more loose and irregularly oriented; **2**) some rare skeletal hyphae, always associated with rhizomorphs.

Rhizomorphs simple to differentiated.

— When poorly developed built up by **1**) some generative hyphae regular, fibulate or with some infrequent simple septa, (2) 2.5–4 (5) μm wide, branching at some distance from septa, sometimes with simple, short anastomosis, with thin to slightly thickening walls, infrequently with thick walls, hyaline, interwoven with **2**) some generative hyphae, regular, straight, fibulate or with some secondary simple septa, up to 7 μm wide, cells of variable length, up to 300 (500) μm , with solid walls (2.5 μm) and a narrow lumen, sometimes with localized thickenings, hyaline to subhyaline.

— Soon with few skeletal hyphae, regular, straight, rarely with some elbow-like bends, 1.5–2 (2.5) μm , with solid walls and narrow lumen, hyaline, starting from generative hyphae, characteristically with a thin skeletal hypha 0.8–1.5 μm thick, branching at right angle at 5–10 μm from the last clamp (see notes).

— When well developed with **1**) a central core of broad hyphae, often sausage-shaped, simple-septate or with small sclerified clamps difficult to see, 8–16 μm in diam., mostly with thin or slightly thickening walls, hyaline or sometimes subhyaline, **2**) a mediostatium built up by normal generative hyphae as described above, **3**) an outer layer built up mostly by skeletal hyphae that may become the dominant kind of hyphae of the older rhizomorphs.

Cystidia absent.

Basidia narrowly clavate to subcylindrical, sinuous, 40–70 (80) \times 8–10 (12) (apex), 6–8 (lower middle), 4–5 μm (base), hyaline or very pale yellowish, fibulate at the basal septum; 4 sterigmata up to 7 (9) μm long and 1.5–3 μm wide at the base.

Basidiospores globose to subglobose, sometimes broadly ellipsoid, with regular outline or rarely with slightly sinuous outline [potatiform], 8.5–11 μm across or (8.5) 9–11 (11.5) \times (7.5) 8–9 (9.5) \times (8) 8.5–9.5 (10) μm , $Q^1 = (1.05) 1.1–1.25 (1.3)$, $Q^2 = (1) 1.05–1.15 (1.2)$, echinulate, with thickening or thick wall (0.5–1.2 μm), pale yellowish brown, yellowish-brown, olivaceous, brownish, greyish-brown, darker than all other elements. Aculei

varying between collections: in some small and slightly crowded, up to $0.5 (1) \times 0.2\text{--}0.5 \mu\text{m}$, in other longer, stronger and fewer, up to $1.5 (2.5) \times 0.5\text{--}1 (1.2) \mu\text{m}$.

Chemical reactions: KOH: basidiome faintly darkening and spores slightly or distinctly more greenish; IKI: none or some endings of thick-walled hyphae more or less amyloid [em-8391].

Incrustation: almost all hyphae and hymenial elements coarsely to strongly encrusted by weakly adhering granular hyaline crystals visible in water mounts, almost completely dissolving in KOH and other dyes.

Comments

Tomentella asperula is easily determined when well developed thank to the dark green-grey brown colliculose hymenial surface, the white rhizomorphic margin and subiculum, and the large, globose spores.

I have found a unique feature present in **all specimens seen**, a peculiar hyphal branching pattern: a thin hypha outgrowing perpendicular from skeletal hyphae at about $10 \mu\text{m}$ from the last clamp [fig. 13]. This is a striking feature that I have never seen elsewhere. It is rather easily observable by tracing back the skeletal hyphae in well developed rhizomorphs up to the starting point.

There are some variable characters between collections that are worth to be notified:

—*T. asperula* s. str. has strong and rather long aculei while specimens determined by Litschauer as *T. gibbosa* have smaller and slightly more crowded spines: about 20–35 aculei visible in dorsal view for *asperula* s.str., about 35–45 for *gibbosa*. This difference was also noted by Cížek [1], who pointed out also small variations in basidiome colour and reaction with KOH.

—*T. griseocinnamomea* has a less distinct subiculum and light grey rhizomorphs. Also the hymenophore is smoother and more grey than usual, but the type (unique collection known) was growing on soil and is ‘poor and scanty’ as already said by Wakefield in the original publication.

Wakefield [10] wrote «The spores resemble closely those of *T. gibbosa* Litsch. but other characters seem sufficiently distinct, notably the shorter basidia and absence of any thick-walled hyphae.» I found the basidia quite agreeing with those of *gibbosa* and *asperula*, $45\text{--}65 \times 8\text{--}11 \mu\text{m}$, and the presence of skeletal and thick-walled hyphae in rhizomorphs.



Fig. 1: Dried basidiome. Image width = 33 mm [em-6158]

Specimens examined

AUSTRIA — **Tirol** – Karioendel (?), Hinterantal (?), on a coniferous tree, leg. V. Litschauer, 21.VIII.1926, original material of *Tomentella gibbosa* Litsch. (PRM 776539)

FRANCE — **Doubs** – Bonnevaux, on lying, decayed wood and bark of *Betula pendula*, leg. G. Trichies, 27.VIII.1999 (GT 99 281, em-8391) – Jougne, on wood of a strongly decayed stump of *Quercus sp.*, leg. R. Hentic, 2000 (R. Hentic 9929, em-7275)

ITALY — **Trentino-Alto Adige** – Terzolas, Le Tovare (Val di Sole), on bark of a lying branch of a coniferous tree, leg. E. Martini, 18.IX.1997 (em-6158)

PAKISTAN — **Punjab** – Patriata, on litter, leg. A. Ahmad 8006, 28.VIII.1953, holotype of *Tomentella griseocinnamomea* Wakef. (K(M) 69222)

RUSSIA NORTH — **Murmansk** – Knyazhaya Guba, on *Betula sp.*, leg. P.A. Karsten, holotype of *Hypochnus asperulus* P. Karst. (H PAK 1444)

SWITZERLAND — **Bern** – Hofstetten, Stipfi Eywald, on bark of a lying, rather hard branch of *Picea abies*, leg. E. Martini, 16.X.1999 (em-7079) – *ibid.*, on wood of a lying, rather hard branch of *Fagus sylvatica*, leg. E. Martini, 16.X.1999 (em-7081)

TURKEY – Ilgaz-Dagh, on *Abies bornmulleriana*, leg. A. Pilat, original material of *Tomentella gibbosa* Litsch. (PRM 776537, A.Pilat, Iter orientale no. 179) – *ibid.*, on wood of *Abies bornmulleriana*, leg. A. Pilat, VIII.1931, lectotype of *Tomentella gibbosa* Litsch. (W 20414, A.Pilat, Iter Orientale 1931, n.317)



Fig. 2: Dried basidiome. Image width = 33 mm [em-8391]



Fig. 3: Dried basidiome. Image width = 26 mm [em-6158]



Fig. 4: Colliculose hymenophore with scraped surface to show the rhizomorphic whitish subiculum (dried basidiome). Image width = 9 mm [em-6158]



Fig. 5: Colliculose hymenophore and rhizomorphic margin (dried basidiome). Image width = 9 mm [em-6158]

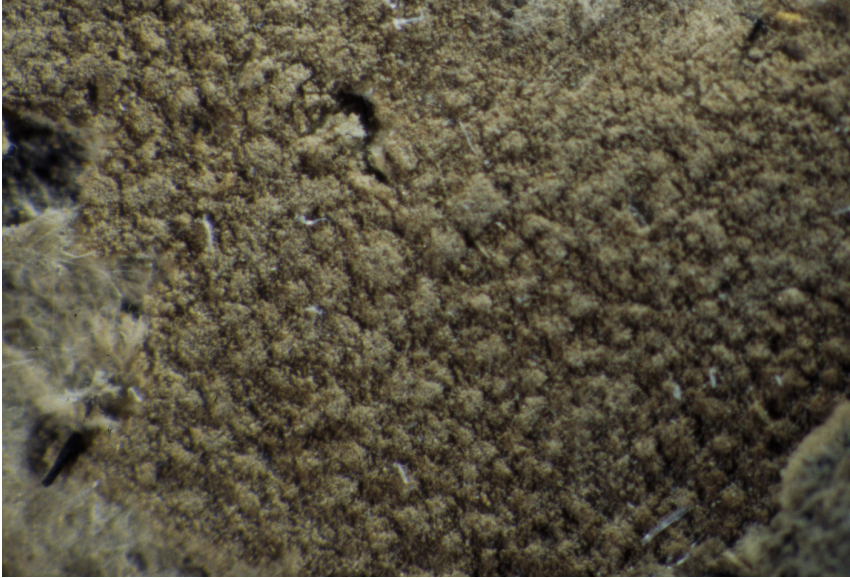


Fig. 6: Colliculose hymenophore and hypochnoid-fibrose subiculum (colliculi slightly flattened by compression). Image width = 4.5 mm [H PAK 1444]

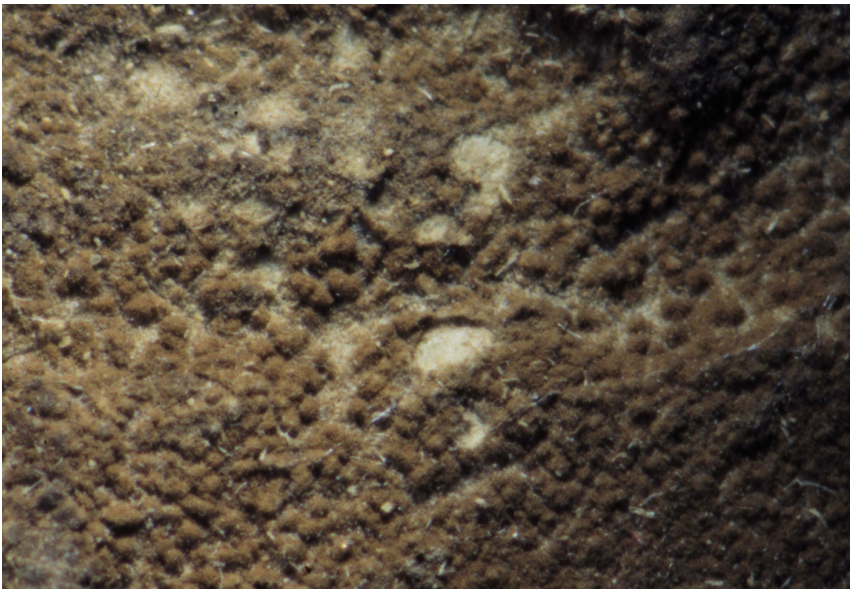


Fig. 7: Hymenophore showing the pale subiculum where colliculi have been peeled off. Image width = 5 mm [PRM 776539]

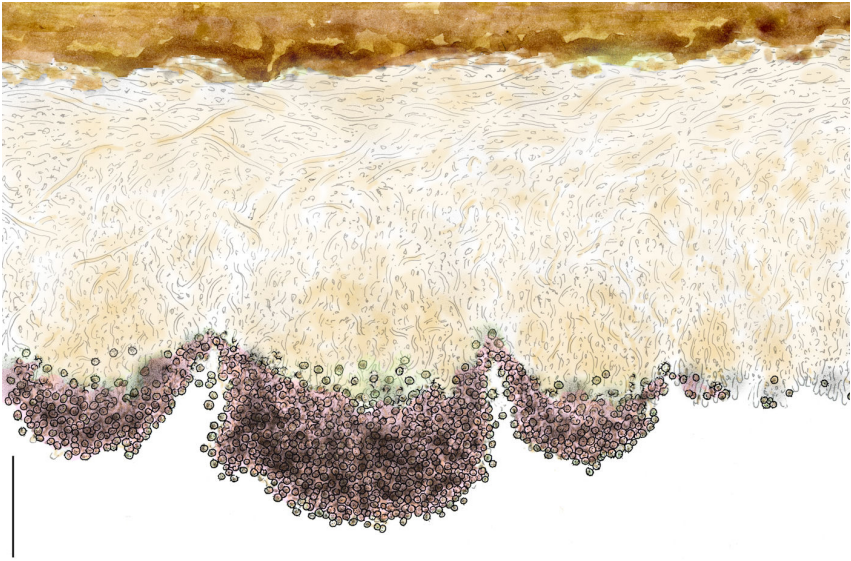


Fig. 8: Section through the basidiome and substrate (in KOH). Bar = 0.1 mm [em-6158]



Fig. 9: Different kinds of hyphae in rhizomorphs. Bar = 10 μ m [H PAK 1444]



Fig. 10: Rhizomorphs. Bar = 10 μm [H PAK 1444]

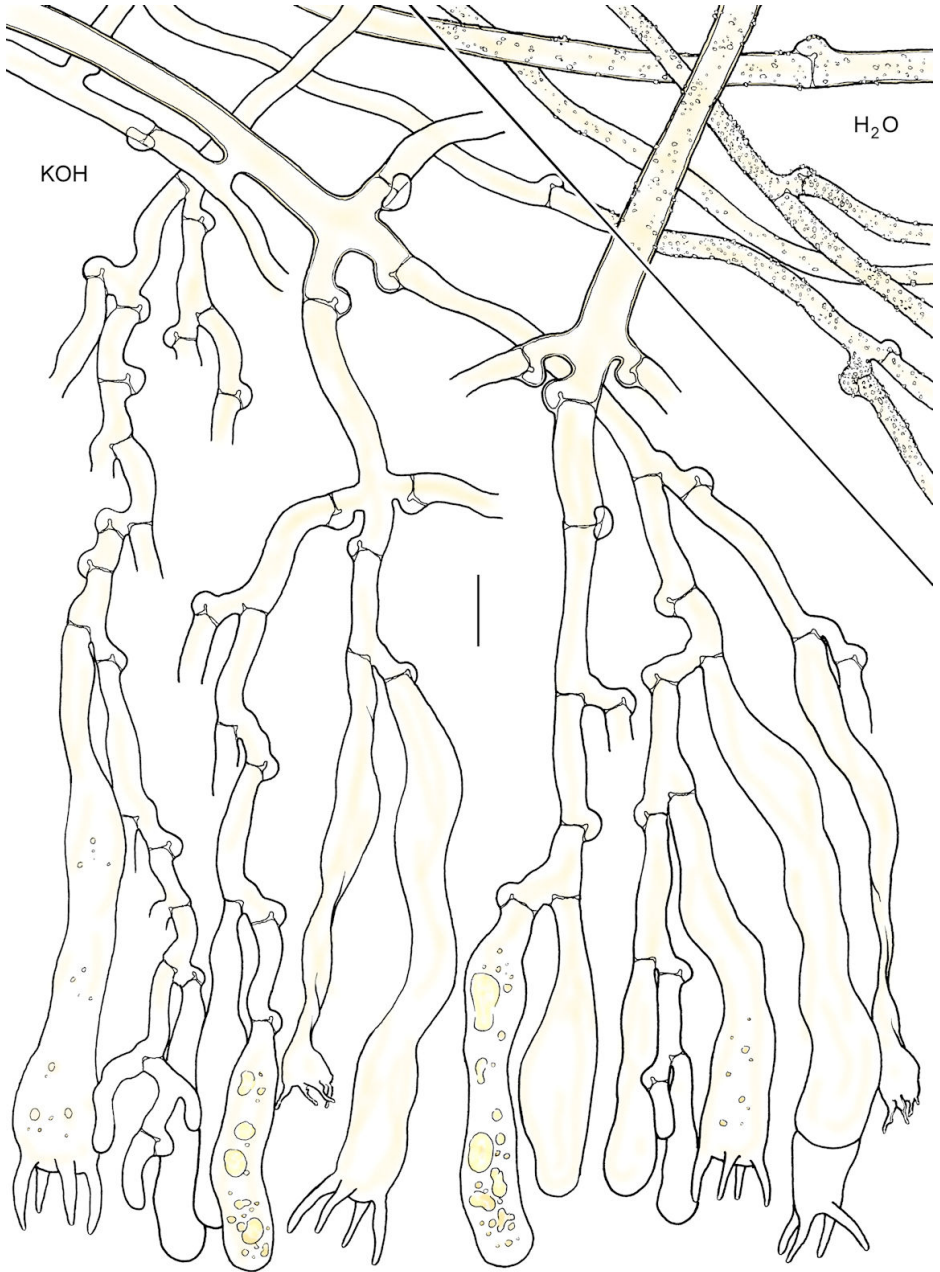


Fig. 11: Basidia, subhymenial and subicular hyphae. Bar = 10 μ m [em-6158]

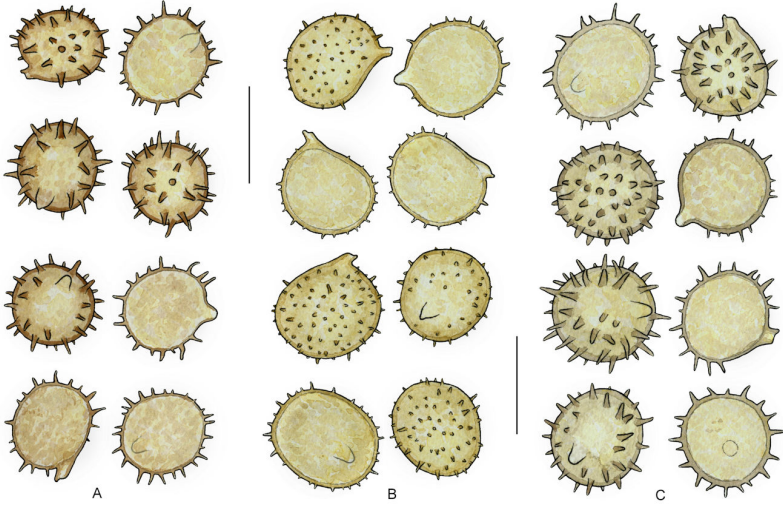


Fig. 12: Basidiospores. **A)** from the holotype of *Tomentella asperula* [H PAK 1444]; **B)** from the lectotype of *T. gibbosa* [W 20414]; **C)** from the holotype of *T. griseocinnamomea* [K(M) 69222]. Bar = 10 μ m

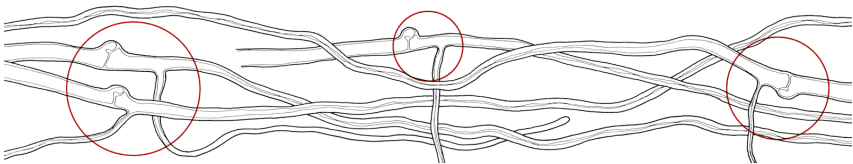


Fig. 13: Thin hyphae outgrowing at 90° from skeletal hyphae about 10 μ m after the last clamp. [H PAK 1444]

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