

MYCOLOGY

SPINIGER, A NEW GENUS FOR IMPERFECT STATES  
OF BASIDIOMYCETES

BY

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SUMMARY

The genus *Spiniger* is introduced for the oedocephaloid imperfect states of various basidiomycetes. A descriptive key to the species is given.

The genus *Oedocephalum* has been confined to the imperfect states of ascomycetes (STALPERS, 1974). Consequently a new genus is proposed to accommodate similar imperfect states of basidiomycetes.

**SPINIGER** Stalpers *gen. nov.*

Coloniae fere celeriter vel lente crescunt, albidae vel ochraceae vel brunneae. Hyphae hyalinae, tenui-tunicatae, septatae, fibulatae vel efibulatae, ramosae; deinde hyphae crassi-tunicatae adesse possunt. Conidiophora erecta, solitaria vel 2-4 gregaria, simplicia vel ramosa, hyalina, septata an non, sensim dilatata ad apicem conidiiferum. Pars conidiifera polyblastica, a stipite non delimitata, dentibus conidiiferis conicis vel cylindricis, 1.5-7  $\mu\text{m}$  longis praedita. Conidia unicellularia, levia vel ornamentata, hyalina, forma varia, basi apiculata an non.

Species typica: *Heterobasidion annosum* (Fr.) Bref., status conidialis = **Spiniger meineckellus** (A. J. Olson) Stalpers *comb. nov.* Basionym: *Cunninghamella meineckella* A. J. Olson in *Phytopathology* 31: 1076. 1941.

Colonies on malt-agar growing moderately rapidly to very slowly, covering the Petri dish in 3 to more than 6 weeks, whitish, later often with ochraceous or brownish tinges. Hyphae hyaline, thin-walled, septate, branched, clamp connections may be present. After 2-4 weeks thick-walled or skeletal hyphae may occur. Conidiophores erect, solitary or up to 4 originating from the same cell, simple or branched, hyaline, septate or aseptate, gradually widening apically into the polyblastic conidiogenous region. Conidiogenous region not separated from the non-conidiogenous region, covered with conical to cylindrical denticles (1.5-7  $\mu\text{m}$  long) on which the conidia are borne. Conidia one-celled, smooth-walled or ornamented, hyaline, globose to cylindrical, apiculate or not.

This genus comprises imperfect states of basidiomycetes belonging to several genera and families of the Aphyllphorales.

1. Lachnocladiaceae: *Vararia* Karst. subg. *Dichostereum* (Pilát) Boidin, characterized by the presence of chlamydo-spores, dichohyphidia and/or sulphocystidia with papillate protuberances (LANQUETIN, 1973a, 1973b; NOBLES, 1942).
2. Corticiaceae: *Hyphoderma* Wallr. emend. Donk, easily recognizable by its large cylindrical to curved conidia (McKEEN, 1952; NOBLES, 1935) and *Corticium furfuraceum*, characterized by the very slow growth, hyphal strings and consistently nodose-septate hyphae (MAXWELL, 1954).
3. Echinodontiaceae: *Laurilia sulcata* which has skeletal hyphae and lacks chlamydo-spores (MAXWELL, 1954; DAVIDSON et al., 1961).
4. Bondarzewiaceae: *Bondarzewia berkeleyi* with skeletal hyphae, warty to echinulate conidia and numerous chlamydo-spores (NOBLES, 1948).
5. Polyporaceae: *Heterobasidion annosum* (BREFELD, 1888; NOBLES, 1948) and *Trametes insularis* (BAKSHI et al., 1970), with rare to uncommon clamp connections on the dikaryotic mycelium.

The descriptive key is partly based on own observations and partly on the literature mentioned above.

KEY TO THE SPECIES (based on cultural characters).

- 1a. Conidia cylindrical or slightly curved, smooth,  $9-19 \times 2.5-4.5 \mu\text{m}$ ; conidiogenous denticles up to  $2 \mu\text{m}$  long; all hyphae thin-walled, with clamp connections; odourless . . . . . 2
- 1b. Conidia globose, obovoidal, pyriform or ellipsoidal. . . . . 4
- 2a. Conidia  $11.5-17 \times 3.5-4 \mu\text{m}$  (average  $14.3 \times 3.7 \mu\text{m}$ ); conidiogenous vesicle up to  $10 \mu\text{m}$  broad; mat white at first, later with cream to pinkish buff tinges; fruit-bodies absent. Restricted to *Populus* (Fig. 1a) . . . . .  
 . . . . . *Hyphoderma populneum* (Peck) Donk  
*Spiniger curiosus* (Parm. & Žukov) Stalpers *comb.nov.* -  
*Paullicorticium curiosum* Parmasto & Žukov apud  
 Parmasto in *Česká Mykol.* 23: 73. 1969 (basionym) is probably the imperfect state of this species.
- 2a. Conidia on average smaller and narrower. On wood of various frondose trees . . . . . 3
- 3a. Conidia  $10-19 \times 2.5-4.5 \mu\text{m}$  (average  $13.8 \times 3.3 \mu\text{m}$ ); conidiogenous vesicle  $8-15.3 \mu\text{m}$  broad; mat white, only the mycelium against the side walls with brown tinge; fruit-bodies absent . . . . .  
 . . . . . *Hyphoderma mutatum* (Peck) Donk
- 3b. Conidia  $9-15 \times 2.7-3.6 \mu\text{m}$  (average  $12 \times 3.3 \mu\text{m}$ ); conidiogenous vesicle  $5.4-10 \mu\text{m}$  broad; mat white with tinges of pinkish buff; after 4-6 weeks fruit-bodies are often formed . . . . .  
 . . . . . *Hyphoderma heterocystidium* (Burt) Donk

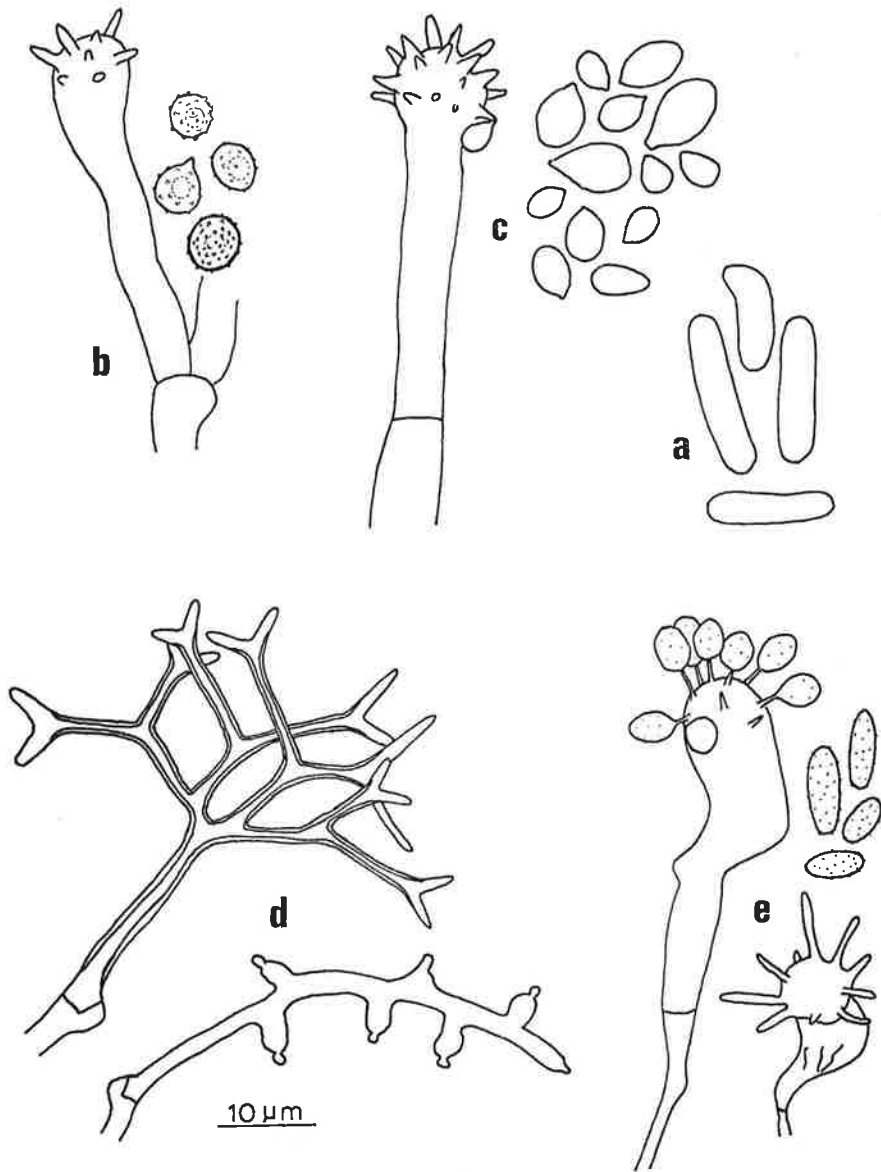


Fig. 1. a, *Hyphoderma populneum*, conidia. b, *Bondarzewia berkeleyi*, conidiogenous structure and conidia. c, *Spiniger meineckellus*, conidiogenous structure and conidia. d, *Vararia pallescens*, dichohyphidium and sulphocystidium. e, *Laurilia sulcata*, conidiogenous structures and conidia.

- 4a. Skeletal hyphae present after 4–6 weeks; conidia echinulate to smooth. On coniferous wood . . . . . 5
- 4b. Skeletal hyphae absent, but thick-walled hyphae may occur; conidia smooth. On frondose or coniferous wood . . . . . 6
- 5a. Conidia globose, warty to echinulate, 5–7.5 µm in diam., with vacuoles; chlamydospores globose to subglobose, 10–16 ×

- 8–15  $\mu\text{m}$ , more rarely ellipsoidal, 9–20  $\times$  7–10  $\mu\text{m}$ ; conidiogenous vesicle to 15  $\mu\text{m}$  broad, denticles to 6  $\mu\text{m}$  long; clamp connections absent; mat white, later sometimes with tinges of cinnamon buff, at first downy, then thick, tough, pellicular; odour strong, sweet (Fig. 1b) . . . . .  
. . . . . *Bondarzewia berkeleyi* (Fr.) Bond. & Sing.
- 5b. Conidia pyriform to narrowly ellipsoidal, smooth-walled to slightly warted, 5–9(–10)  $\times$  2.5–4  $\mu\text{m}$ , guttulate or granular; chlamydospores absent; conidiogenous vesicle to 10  $\mu\text{m}$  broad, denticles to 7  $\mu\text{m}$  long; dikaryotic mycelium consistently with clamp connections; cystidial structures sometimes present; mat white, later with buff to ochraceous tinges, sometimes cinnamon-brown, floccose to woolly, later almost felty; odour faint, somewhat fruity, or absent (Fig. 1e) . . . . .  
. . . . . *Laurilia sulcata* (Burt) Pouzar
- 6a. Chlamydospores present, sometimes rare; sulphocystidia always present, with papillate protuberances; dichohyphidia usually present; septa in the dikaryotic mycelium always with clamp connections . . . . . 7
- 6b. Chlamydospores absent; sulphocystidia with papillate protuberances and dichohyphidia absent; dikaryotic mycelium with or without clamp connections . . . . . 13
- 7a. Conidiophores abundant; conidia to 3.5  $\mu\text{m}$  long . . . . . 8
- 7b. Conidia larger, at least 4  $\mu\text{m}$  long . . . . . 10
- 8a. Conidiogenous vesicle 5.6–12  $\mu\text{m}$  wide; conidia variable in size and shape, subglobose to obovoidal or ellipsoidal, 1.9–3.7  $\mu\text{m}$  broad (MAXWELL, 1954) or to 5.5  $\times$  4  $\mu\text{m}$  (drawing by LANQUETIN, 1973b); chlamydospores subglobose to ellipsoidal, 7.8–15.6  $\times$  4.7–7.8  $\mu\text{m}$ ; dichohyphidia absent on malt-agar, present on Hagem-agar; mat at first woolly to mealy, later collapsing, white to buff. N. America and northern Europe . . . . . *Vararia granulosa* (Fr.) Laurila
- 8b. Conidiogenous vesicle 4–5(–8)  $\mu\text{m}$  wide . . . . . 9
- 9a. Conidia pyriform, more rarely subglobose, 2.5–3  $\times$  2–2.8  $\mu\text{m}$ ; chlamydospores subglobose, 12–15(–17)  $\mu\text{m}$  in diam.; dichohyphidia absent or very rare; mat woolly, later felty, at first whitish, becoming alutaceous; yellowish brown drops of exudate often present; after 6 weeks salmon to isabel ceraceous fructifications are locally present; culture floccose in other places. N. America, Argentina and western Europe . . . . .  
. . . . . *Vararia effusata* (Cooke & Ellis) Rogers & Jackson
- 9b. Conidia obovoidal, 2.7–3.5  $\times$  2.5–3  $\mu\text{m}$ ; chlamydospores subglobose, 9–12  $\mu\text{m}$  in diam.; dichohyphidia always present; mat velvety, later appressed, white to cream, with drops of exudate; sometimes fructifications formed against the wall of

- the Petri dish. N. and S. America. . . . .
- . . . *Asterostromella dura* Bourd. & Galzin *sensu* Lanquetin
- 10a. Conidiophores rare; mat with cinnamon tinge. . . . . 11
- 10b. Conidiophores abundant; mat white to yellowish brown . . . . . 12
- 11a. Chlamydo-spores rare or absent, ellipsoidal, 7–12 × 6–10  $\mu\text{m}$ ;  
conidia globose to subglobose, somewhat thick-walled, 3–4(–5) ×  
2.5–3.5(–3.8)  $\mu\text{m}$ ; conidiogenous vesicle 4–4.5  $\mu\text{m}$  wide; mat  
at first woolly to velvety, becoming felty and lumpy, whitish  
to isabel or cinnamon; reverse often brown. N. America (Fig. 1d)  
. . . . . *Vararia pallescens* (Schw.) Rogers & Jackson
- 11b. Chlamydo-spores abundant, thick-walled, subglobose, 10–13  $\mu\text{m}$   
diam., or ellipsoidal, 10–16 × 6–9  $\mu\text{m}$ ; conidia pyriform, more  
rarely subglobose, 4–4.5(–5) × (3–)3.5–4(–4.5)  $\mu\text{m}$ ; conidio-  
genous vesicle 4–5  $\mu\text{m}$  wide; mat at first floccose to velvety,  
becoming somewhat collapsed later, whitish, cream to isabelle  
or cinnamon locally, always with a brownish exudate. Tropical  
W. Africa . . . . . *Vararia ramulosa* Boidin & Lanquetin
- 12a. Chlamydo-spores thick-walled, subglobose, 7–14 × 8–11  $\mu\text{m}$ ;  
conidia globose, 4–4.5(–5)  $\mu\text{m}$  diam., rarely subglobose,  
4–6 × 3.5–5  $\mu\text{m}$ ; conidiogenous vesicle (4–)5–6(–7)  $\mu\text{m}$  wide;  
mat woolly to velvety-plushy, whitish, yellowish brown locally.  
Australia and New Zealand . . . . .  
. . . . . *Vararia rhodospora* (Wakefield) G. H. Cunn.
- 12b. Chlamydo-spores subglobose to ellipsoidal, 7.8–15.6 × 4.7–  
7.8  $\mu\text{m}$ ; conidia variable in both size and shape, cf. *Vararia*  
*granulosa* . . . . . 8a
- 13a. Conidia globose to subglobose, somewhat thick-walled,  
3–4(–5) × 2.5–3(–3.8)  $\mu\text{m}$ , cf. *Vararia pallescens* . . . . . 11a
- 13b. Conidia subglobose, obovoidal, pyriform or ellipsoidal, thin-  
walled, 4–12  $\mu\text{m}$  long. . . . . 1 4
- 14a. Conidia narrowly ellipsoidal to tear-shaped, 4.9–7 × 2.5–3.5  $\mu\text{m}$ ;  
conidiogenous vesicle to 5  $\mu\text{m}$  wide, denticles to 4.5  $\mu\text{m}$  long;  
hyphae 1.7–3.5  $\mu\text{m}$  wide, thin-walled, septa always clamped  
when dikaryotic; mat white, later with some yellowish tinge;  
hyphal strings present; petri dish not covered within 6 weeks  
. . . . . *Corticium furfuraceum* Bres.
- 14b. Conidia to 5  $\mu\text{m}$  broad; conidiogenous vesicle at least 7  $\mu\text{m}$   
broad; clamp connections absent or uncommon (the majority  
of the septa simple) . . . . . 15
- 15a. Conidia obovoidal to pyriform, 4.5–12 × 3.8–5  $\mu\text{m}$ ; conidio-  
genous vesicle 10–17  $\mu\text{m}$  wide; hyphae usually simple septate,  
but clamp connections not rare; mat white to cream buff,  
mealy to floccose or felty; odourless; poroid fruit-bodies may  
occur after 6 weeks. India, Japan and Philippines . . . . .  
. . . . . *Trametes insularis* Murr.

- 15b. Conidia subglobose to obovoidal to pyriform, 4.5–8(–10) × 3–6  $\mu\text{m}$ ; conidiogenous vesicle 7.5–18  $\mu\text{m}$  wide; clamp connections rare or absent; mat white to cream buff to honey yellow, sometimes almost crustose, brown with cuticular cells; odour absent, faint or strong, disagreeable; no fruit-bodies produced. Cosmopolitan (Fig. 1c). *Heterobasidion annosum* (Fr.) Bref. st. con. . . . .  
 . . . *Spiniger meineckellus* (A. J. Olson) Stalpers

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