

***Bolbitius subvolvatus*, a new species from Sardinia (Italy)**

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Abstract: A new species of the genus *Bolbitius*, *B. subvolvatus* collected on straw substrate in Sardinia (Italy) is described. Its differences to similar species are discussed; two colour plates and microscopical drawings are given.

Zusammenfassung: Eine neue Art der Gattung *Bolbitius*, *B. subvolvatus*, wird beschrieben. Sie wurde auf Stroh in Sardinien (Italien) gesammelt. Ihre Unterschiede zu ähnlichen Arten werden diskutiert, zwei Farabbildungen und Mikrozeichnungen werden gegeben.

In Europe recently some new species of the genus *Bolbitius* were described. They all deviated in several characters from *Bolbitius* taxa hitherto known. *Bolbitius elegans* E. HORAK, G. MORENO, A. ORTEGA & ESTEVE-RAV. (HORAK & al. 2002) from Spain is as yet the only secotioid representative; *Bolbitius ferrugineus* ARNOLDS (ARNOLDS 2003) from Italy differs from the closely related *Bolbitius reticulatus* (PERS.: FR.) RICKEN by vivid pileus colour and several microscopical characters. Finally, *Bolbitius psittacinus* HAUSKN., ANTONÍN & POLČÁK (HAUSKNECHT & al. 2007) from Czech Republic has uncommon and very variable pileus colours (red, orange, yellow, olive to green).

From December 2007 to end of January 2008 the second author observed a *Bolbitius* species in Sardinia growing on straw and reminding a bit of *B. lacteus* J. E. LANGE. However, young basidiocarps had a marked volvalike zone at the stipe base. Microscopical examination revealed distinct differences especially in the structure of the lamellar edge. Therefore, it is described as a new species.

***Bolbitius subvolvatus* HAUSKN., CONTU & KRISAI, spec. nova** (Figs. 1, 2)

Mycobank MB 511744.

Latin description: Pileus ad 30 mm altus, 20-40 mm latus, isabellinus ad ochraceo-isabellinus, deinde albus. Lamellae confertae, tenues, ferrugineae, in juventute albidae.

Stipes albus, juventute basi volvatus, infra et supra flocculosus ad squarroso-squamulosus, vetuste glaber. Sporae valde variabiles, $10,5-15 \times 8-10,5 \times 7-9,5 \mu\text{m}$, mediano $10,9-13,9 \times 8,7-9,6 \times 7,9-8,4 \mu\text{m}$, ellipsoideae, leviter lentiformes, crasse tunicatae, poro germinativo magno. Acies lamellarum sterilis, multiplex, consistens elementis sphaericis, ellipsoideis, cylindricis, lageniformibus ad leviter rostellatis, partim catenuliformibus. Pleurocystidia absentia. Pileipellis hymeniformis consistens elementis sphaeropedunculatis ad clavatis, pileocystidia absentia. Habitatio residuo straminis.

Holotypus: Italia, Sardinia, Olbia-Tempio, Golfo Aranci, 11. 1. 2008, leg. M. CONTU (WU 28377).

Characters:

Pileus: -30 mm high, 20-40 mm wide, first oviform to ellipsoid, hemispherical, later flat convex, conico-convex to plano-convex and expanding, not distinctly umbonate; young isabelline, ochraceous isabelline, then fading to nearly white, but centre often retaining a cream to pale ochraceous-isabelline tinge; not hygrophanous, not striate, surface very slimy, smooth, not rugose, older only a narrow zone along margin slightly crenate. Margin even very young without veil traces.

Lamellae: free, crowded, slightly ventricous, very thin, first white, later yellow-brown to rubiginous, with paler, slightly flocculose lamellar edge, older deliquescent from the edge upwards.

Stipe: 30-65 mm long, 2-11 mm thick, first stout, soon expanding, cylindrical, always white, young basally with white volvalike zone, soon vanishing, above and below flocculose to squarrose-squamulose, but soon smooth; hollow.

Context: thin, brittle, smell and taste weak, slightly like raddish, white, above lamellae ochraceous, inside stipe older slightly yellowish.

Spore print: rubiginous.

Spores: $10.5-15 \times 8-10.5 \times 7-9.5 \mu\text{m}$, mean $10.9-13.9 \times 8.7-9.6 \times 7.9-8.4 \mu\text{m}$, Q = 1.2-1.6, very variable in size, ellipsoid, lentiform, with thick wall and wide, central germ-pore, orange- to rusty yellow in KOH.

Clamp connections: not found even in very young basidiocarps.

Basidia: 4-spored, $25-45 \times 12-16 \mu\text{m}$, first clavate, older slightly doliform.

Pseudoparaphyses: present.

Cheilocystidia: $15-45 \times 4-12 \mu\text{m}$, multilayered, consisting of spherical, ellipsoid, cylindrical, lageniform to slightly rostrate elements, partly also catenate; lamellar edge entirely sterile.

Pleurocystidia: absent.

Stipitipellis: especially at stipe apex consisting of very variable, cylindrical, clavate, slightly utriform, ellipsoid to sphaero-catenulate elements ($20-45 \times 6-17 \mu\text{m}$).

Veil: consisting of interwoven cylindrical to slightly ventricous, at septa also constricted, thin-walled hyphae ($20-45 \times 3-10 \mu\text{m}$).

Pileipellis: hymeniform, young mostly consisting of clavate elements ($30-35 \times 6-12 \mu\text{m}$), later increasingly widely clavate to sphaeropedunculate ($\sim 20 \mu\text{m}$ wide); especially young covered by slime. Pileocystidia absent.

Habitat: on straw remnants, gregarious.

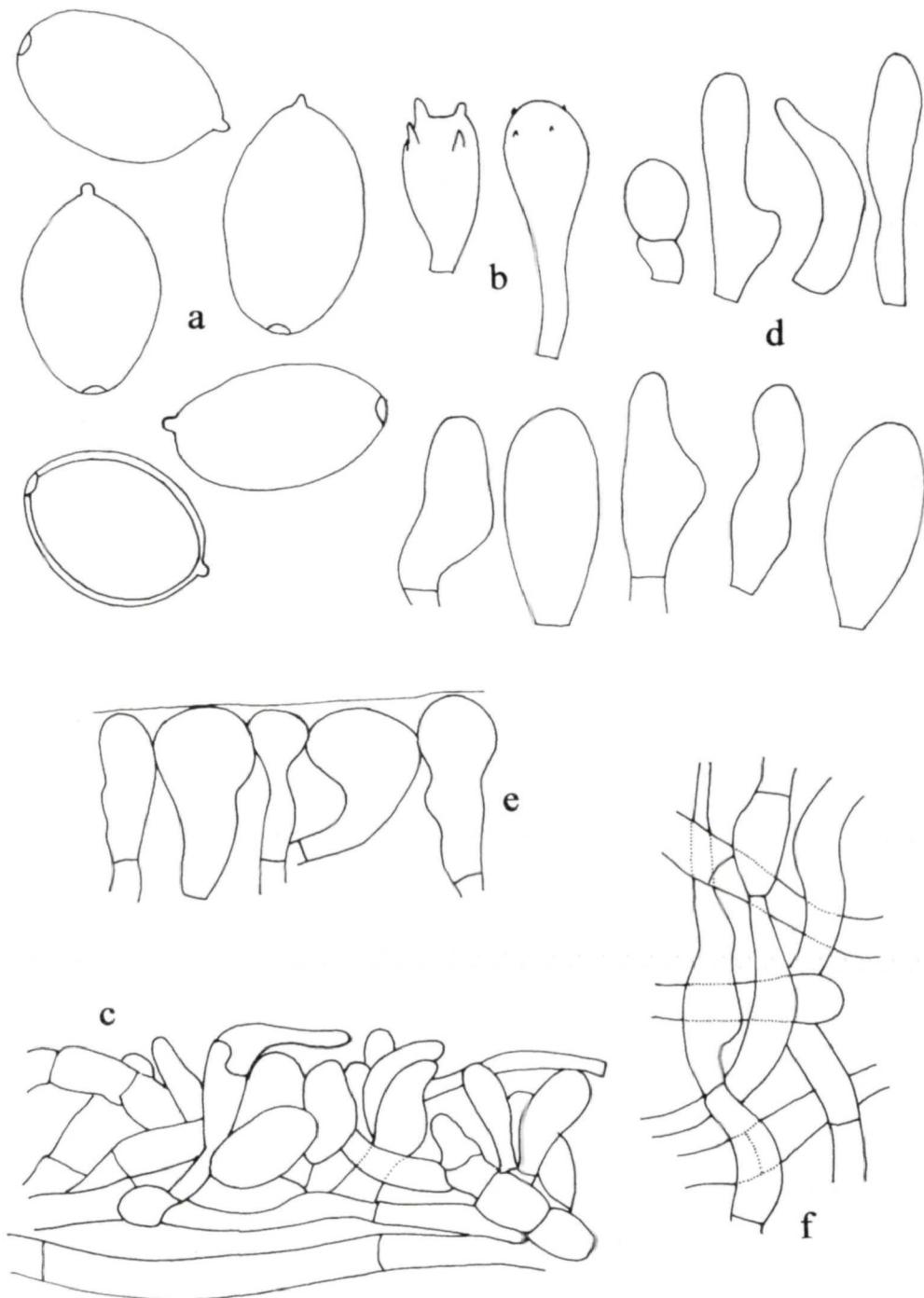


Fig. 1 a-f. *Bolbitius subvolvatus* (WU 28377, holotype). a spores, $\times 2000$, b basidia, $\times 800$, c lamellar edge with cheilocystidia, $\times 800$, d caulocystidia, $\times 800$, e pileipellis, $\times 800$, f elements of veil, $\times 800$.

Collections examined (besides type): Italy: Sardinia, Olbia-Tempio, Golfo Aranci, Golfo di Marinella, December 2007, leg. M. CONTU (WU 28376); -- 20. 1. 2008, leg. M. CONTU (WU 28378); -- 27. 1. 2008, leg. M. CONTU (WU 28379).

At first sight *Bolbitius subvolvatus* eventually could be confused with *B. lacteus* (here treated as a separate species) or with faded specimens of *B. titubans* (BULL.: FR.) FR., especially when the young pileus colour and in older basidiocarps the veil traces are already absent. Both taxa can be easily separated from our new species by the structure of the lamellar edge, which is not sterile, but heteromorph (with basidia intermixed) and where clavate, utriform or widely lageniform cheilocystidia are present.

The new species from Golfo di Marinella is remarkable in several aspects. Up to now in the genus *Bolbitius* there is no species known worldwide with veil or volva (SINGER 1978, 1986; WATLING 1982; WATLING & GREGORY 1981). WATLING (1982) mentions as “distinct character” in the genus *Bolbitius*: “velar material if present fugacious and never forming a ring or appendiculate veil”. ARNOLDS (2005) explicitly remarks in his genus description “veil absent”.

A second outstanding character is the structure of the lamellar edge. In all European and also in all extra-European species documented in recent decades (PEGLER 1986; RAITHELHUBER 1990; WATLING 1992, 1994; WATLING & TAYLOR 1987) the lamellar edge is heteromorph, consisting of basidia and distinctly larger, versiform cheilocystidia. As yet a completely sterile lamellar edge, consisting of several layers of versiform elements, is unknown to the authors.

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Fig. 2 a, b. *Bolbitius subvolvatus*. a young basidiocarps with well-developed volvalike zone (WU 28376). b basidiocarps in natural habitat (WU 28377, holotype). – Phot. M. CONTU.

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