

Taxonomical remarks to *Collybia hariolorum* var. *alpicola* (*Tricholomataceae*) recently reported from the alpine zone of the Spanish Pyrenees and the French Alps

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Esteve-Raventós, F., V. González, F. Arenal & E. Horak (1998) - Taxonomical remarks to *Collybia hariolorum* var. *alpicola* (*Tricholomataceae*) recently reported from the alpine zone of the Spanish Pyrenees and the French Alps. Z. Mykol. 64/1: 67 - 72.

Key words: *Gymnopus alpicola*, *Gymnopus* sect. *Vestipedes*, alpine agarics, *Dryas octopetala*, Pyrenees, Spain.

Summary: *Gymnopus alpicola* spec., stat. et comb. nov. is proposed for *Collybia hariolorum* var. *alpicola*. The transfer is supported by additional material found by the authors 1996 in the Oscense Pyrenees. The new species is taxonomically close to *G. hariolorum*, which shares the same distinctive smell of rotten cabbage. Apart from striking macroscopical features (purple-bluish coloured stipe, more distant lamellae), the two taxa, however, are also readily separated by several microscopic characters, viz. the shape of the cystidia and the brownish parietal pigment in the pileipellis and trama hyphae.

Resumen: *Gymnopus alpicola* spec., stat. et comb. nov. e propuesto para *Collybia hariolorum* var. *alpicola*. Material recogido en el Pirineo Oscense ha permitido apoyar este tratamiento. Esta especie es próxima a *G. hariolorum*, con la que comparte el mismo olor a col podrida, pero difiere, aparte de su hábitat, en algunos aspectos macro y microscópicos, tales como un estípite con un característico color púrpura-azulado, láminas más distantes y presencia de pigmento parietal parduzco en la pileipellis y trama.

Zusammenfassung: Für *Collybia hariolorum* var. *alpicola* wird der Transfer zu *Gymnopus alpicola* spec., stat. et comb. nov. vorgeschlagen. Die Anhebung zur Art wird durch zusätzliches Material untermauert, das die Autoren 1996 in den Pyrenäen fanden. Die neue Art steht *G. hariolorum* nahe, mit der es den bezeichnenden Geruch nach fauligem Kohl gemeinsam hat. Ausser auffallenden makroskopischen Merkmalen (purpurbläulich gefärbter Stiel, entfernter stehende Lamellen) unterscheiden jedoch auch einige mikroskopische Eigenheiten die beiden Taxa, namentlich die Form der Cheilozystiden und das inkrustierende Pigment auf den Hut- und Tramahyphen.

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During the summer season 1996 field work was carried out by the authors in the alpine and sub-alpine region of the Aragonese Pyrenees. At this occasion a striking species of *Collybia*, growing in association with the dwarf-shrub *Dryas octopetala* (*Rosaceae*), attracted our attention. This agaric is characterized by its strong smell of rotten cabbage and a combination of colours which, at first sight, remind of those observed sometimes on basidiomes of the sympatric *Entoloma cataunicum* (Singer) Noordel., originally described by SINGER (1936) from the eastern Spanish Pyrenees.

Within the genus *Gymnopus* (ss. ANTONÍN & NOORDELOOS 1997) the combination of macroscopic, microscopic and organoleptic characters observed on the present agaric are unique. In order to evaluate its systematic position and its possible relationships, the relevant literature dealing with European and Northamerican species of *Gymnopus* has been screened (ANTONIN & NOORDELOOS 1996, CLEMENÇON 1981, HALLING 1983, LENNOX 1979, METROD 1952, MOSER 1993, MOSER & RAMESEDER 1993, NOORDELOOS 1995). In addition, a critical survey of the pertinent arctic-alpine literature (FAVRE 1955, FAVRE 1960, GRAF 1995, KÜHNER & LAMOURE 1986, LAMOURE et al. 1982, LANGE 1955; SENN-IRLET 1987) revealed that species belonging to *Gymnopus* are in general rather rare in arctic-alpine habitats (HORAK unpubl.). The most common taxa are *Gymnopus alpina* (Vilgaly & O.K. Miller 1987) Antonín & Noordel. (1997, in press), *Gymnopus dryophilus* (Bull.: Fr.) Murrill (1916) and *Rhodocollybia butyracea* (Bull.: Fr.) Lennox (1979), including f. *asema* (Fr.: Fr.) Antonín, Halling & Noordel., which, however, are classified either as members of sect. *Levipedes* or of sect. *Striipedes*.

Recently, BON & BALLARÀ (1996) reported a new taxon of *Collybia* (= *Gymnopus* p.p., as recently proposed by ANTONÍN & NOORDELOOS 1997, whose taxonomic concept is followed herewith), viz. *C. hariolorum* var. *alpicola*, from the alpine zone of the Catalanian Pyrenees, discovered growing among debris of *Dryas octopetala*. The original description of this taxon closely resembles that observed in our collections (distinctive smell, colour of the stipe with „tonalitats blavoses“). In order to prove minor differences concerning the presence/absence, and the size/shape of cheilocystidia, the subsequent re-examination of the holotype of *C. hariolorum* var. *alpicola* revealed that both collections are actually conspecific.

The careful revision of both collections demonstrated that the discussed *Gymnopus* can not be considered a variety of the common *G. hariolorum*. On the contrary, all scrutinized data confirmed our original suspicion that this *Dryas*-associated agaric represents an independent taxon *Collybia* belonging to sect. *Vestipedes*.

The basidiomes from the Oscense Pyrenees (eastern region of the Central Pyrenees) have been discovered in an alpine, N-exposed and steep habitat (*Dryado-Salicetum pyrenaicae*), within extensive carpets of rotting leaves among the prostrate branches of *Dryas octopetala*. The place of discovery (called La Pala de Montinier) of our record is located in the dolomitic mountains near Bielsa village, Sierra de Revilla, South of Valle de Pineta, which shares the same geological and floristical properties as described for this type of habitat from the adjacent Ordesa National Park (see VILLAR 1982, VILLAR et al. 1993).

Microscopic examination follows the current methods recommended for agarics. The drawings have been made with the aid of a camera lucida. The material collected is deposited in AH (University Herbarium, Alcalá de Henares, Spain), and additional voucher material is kept in ZT (Herbarium, Zürich, Switzerland).



Fig. 1: *Gymnopus alpicola* in natural habitat with *Dryas octopetala* (AH 21625; photograph by F. Esteve-Raventós).

Sect. Vestipedes (Fr.) Quél.

***Gymnopus alpicola* (Bon & Ballarà) Esteve-Rav., González, Arenal & E. Horak, spec. et stat. nov., comb. nov.**

Figs. 1 & 2

Basionym: *Collybia hariolorum* (Bull.: Fr.) var. *alpicola* Bon & Ballarà, Revista Catalana Micol. 19: 140. 1996.

Synonym: „*Collybia pyrenaica* Esteve-Rav. & al. (1997), Z. Mykol. (in press)*. - in: ANTONÍN & NOORDELOOS, Libri Bot. 17: 209, (nom. prov., inval.), 1997. „*Collybia alpicola* (Bon & Ballarà) Esteve -Rav. & al. (1997). Bol. Soc. Micol. Madrid 22: 163 (nom. prov., inval.).

Material examined: **SPAIN:** Catalonia: Lleida, Super Spot, Pallars Sobirà, alt. 2300 m, 19. VIII. 1995, in groups among *Dryas octopetala*, leg. Ballarà, Holotype [Herbarium M. Bon (JB-1590/95)]. - Aragón: Huesca, Bielsa, La Pala de Montinier, alt. 2000 m, UTM 30TBH 6921, 28. VIII. 1996, among *Dryas octopetala*, leg.: Arenal, Esteve-Raventós, González, Horak & Villar, AH 21625 and ZT 5873.

To complement the protologue of *Gymnopus alpicola*, the following macroscopical and microscopical data based upon AH 21625 and ZT 5873 are presented:

Basidiomes solitary, gregarious or subfasciculate (Fig. 1). Pileus 10-30 mm in diam., convex to plano-convex, at first pale red-brown, turning pink to argillaceous-pink with age and upon drying, finally changing to ochraceous-pink, hygrophanous, in moist condition weakly striate at margin, glabrous, occasionally sulcate at margin. Lamellae [25-30(-35), l=1-2] moderately crowded to distant, adnexed to adnate-emarginate, segmentiform, not ventricose, up to 4 mm wide, at first concolorous with pileus becoming pink, finally cream or pale argillaceous with pinkish tint, concolorous or whitish edges conspicuously floccose to denticulate-serrate. Stipe -40 x 2-4 mm, central, cylindrical or subfusoid, tapering towards (occasionally compressed) base, dark brown

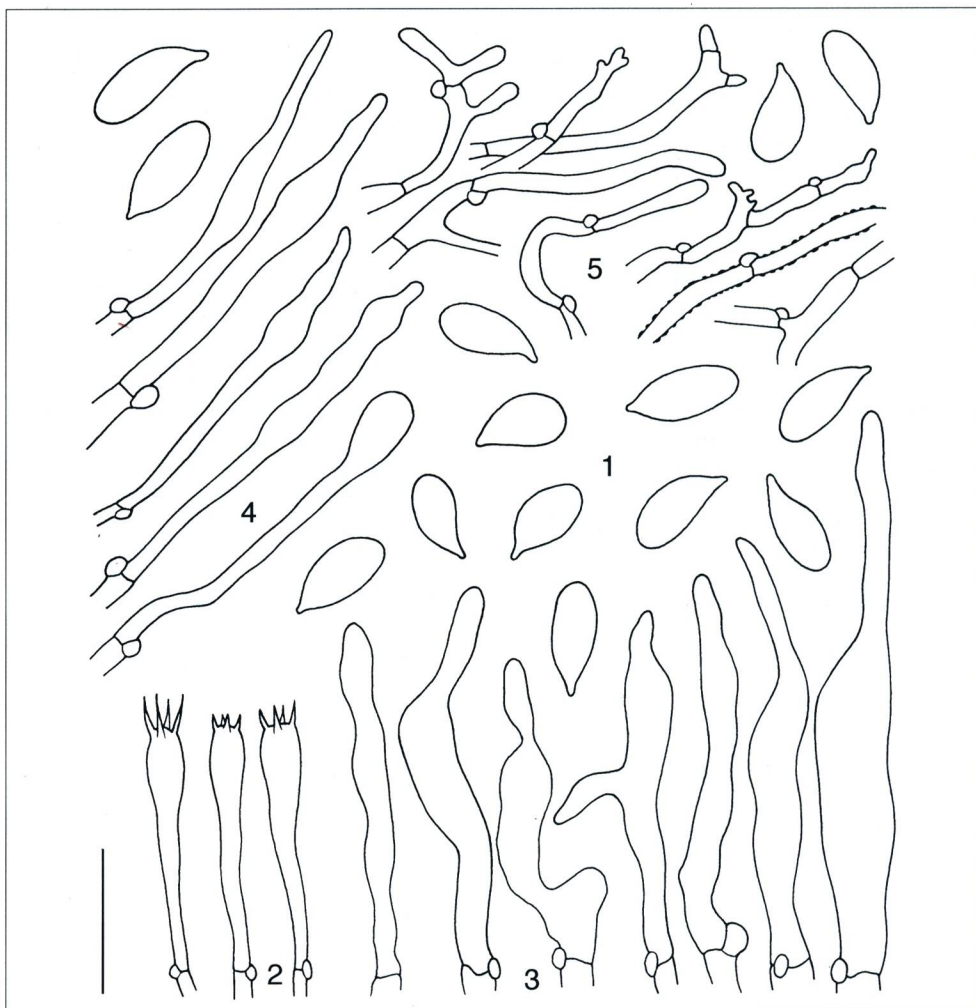


Fig. 2: *Gymnopus alpicola* (AH 21625): 1. Basidiospores. - 2. Marginal hairs at gill edge. - 3. Cheilocystidia (marginal terminal cells). - 4. Caulocystidia (terminal cells of stipitipellis hyphae). - 5. Pileipellis. - (Fig. 2.1: x 2000, bar = 5 μ m; Fig. 2.2, 2.3, 2.4, 2.5: x 1000, bar = 10 μ m).

with conspicuous dark purplish blue or steel blue tinge, apex concolorous with pileus or amber brown, base yellowish, woolly tomentose or furfuraceous over entire length except towards the strigose base covered with whitish to pale ochre rhizoids connected to the substrate, dry, tough, at first solid becoming hollow. Context pale argillaceous to whitish in pileus, dark brown to blue-black in cortex of stipe. Smell strong, reminding of rotten cabbage, with faint component of garlic. Taste like smell, not acrid.

Spore-print white. Basidiospores 6-8.5 (-8.8) x 3-4 μ m, $L \times l = 6.00$ -**7.04**-8.5 (-8.8) x 3-**3.50**-4 μ m, $Q = 1.62$ -**2.02**-2.41 (n=22), ellipsoid to comma-shaped (in lateral view), hyaline, smooth, inamyloid (Fig. 2.1). Basidia 25-35 x 5-7 μ m, clavate, 4-spored, clamped (Fig. 2.2). Cheilocystidia (marginal

hairs) mixed with basidia, 30–40 x 3–6 x 1.5–2 µm, cylindrical, slender, lanceolate to sublageniform, hyaline (Fig.2.3). Pleurocystidia absent. Stipitipellis a very dense trichodermium composed of interwoven or agglutinated, polymorphic caulocystidia, -250 x 4–7 µm, shape ranging from slender cylindric-clavate to subfusoid, membranes occasionally thick-walled, clamped at septa (Fig.2.4). Pileipellis a cutis composed by repent, radially arranged, cylindrical hyphae (5–12 µm diam.), terminal cells cylindrical or with short finger-like projections, membranes non-gelatinized, hyaline, thin-walled, in subcutis weakly encrusted by pale brown (KOH) pigment (Fig.2.5). Clamp connections present. Hyphae of gill trama weakly dextrinoid, 3–5(–15) µm wide, clamped at septa.

On account of the entirely woolly-tomentose stipe and the structural type of pileipellis composed of interwoven hyphae with branched to diverticulate terminal cells, *Gymnopus alpicola* clearly represents a member of sect. *Vestipedes*. All European species of *Gymnopus* belonging both to sect. *Vestipedes* and emitting an unpleasant smell like rotten cabbage, viz. *G. hariolorum* (Bull.: Fr.) Antonín, Halling & Noordel., *G. impudicus* (Fr.) Antonín, Halling & Noordel. or *Gymnopus herinkii* Antonín & Noordel. [*Collybia porrea* (Pers.: Fr.) Singer], are readily distinguished from *G. alpicola*.

Gymnopus alpicola is distinctly separated from *G. hariolorum* by different habitat and substrate preference. In addition, the former taxon is characterised by the colours of the basidiomes (especially in fresh condition), by denser crowded lamellae and by the presence of a brownish encrusting pigment in the pileipellis and gill trama.

Our specimens differ from the holotype description by the more intensive pink colours of the pilei and lamellae and the conspicuously eroded and whitish gill edges. The presence of marginal hairs mixed with basidia as observed in the Aragonese material (absent in the examined holotype) should not be given too much taxonomic value because it is likely that they merely represent marginal basidioles extended secondarily into filiform hairs. This phenomenon can be occasionally observed in collybioid and pleurotoid agarics having tough and long-lasting basidiomes. As a matter of fact these false „cheilocystidia“ have already been reported by KUEHNER (in KUEHNER & ROMAGNESI 1954: 88) and NOORDELOOS (1995) for *Collybia hariolorum*, whose gill edges normally are devoid of cheilocystidia (FAVRE 1951).

Based upon present knowledge (3 records only), the range of distribution of *Gymnopus alpicola* is restricted to the eastern Pyrenees and to the southern French Alps (Les Arcs, Haute Savoie) where this species was also recorded by M. BON (in litt.) in 1996.

None of the four taxa of *Gymnopus* sect. *Vestipedes* mentioned in the monograph of North American representatives (HALLING 1983) are contaxic with *G. alpicola*. In this connection it is worth mentioning that all North American taxa with a woolly-tomentose or hairy stipe lack the peculiar smell of rotten cabbage.

Acknowledgments

The authors are indebted to the Instituto de Estudios Altoaragoneses (Huesca) and the Instituto Pirenaico de Ecología (Jaca, Huesca) for the grant (1996) to study fungi in the alpine and sub-alpine zone of the Parque Nacional de Ordesa and its adjacent regions. In addition Dr. L. VILLAR is thanked for his invaluable support and expertise concerning phytogeographical data and his leadership during the excursions into the Pyrenees. The authors are also grateful to Dr. M. BON (Lille, France) for the loan of type material and suggestions regarding taxonomy and ecology of the above-mentioned agaric.

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Eingegangen: 20. Mai 1997



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Autor(en)/Author(s): Esteve-Raventos Fernando, Gonzalez V., Arenal F., Horak Egon

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