



STUDY OF SOME TRICHOLOMATACEAE AT THE JERADA MINE SITE (NORTHEAST OF MOROCCO)

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ABSTRACT: Surveys conducted in the Jerada mine site (Northeastern Morocco) have revealed the existence, for the first time, of three Basidiomycetes species. These species have been harvested under *Pinus halepensis*, belong to the Tricholomataceae family: *Pseudoclitocybe cyathiformis*, *Clitocybe cerussata* and *Tricholoma terreum*. The first species is considered to be rare, edible, and encountered for the first time under *Pinus halepensis*, the second is toxic and the third species is safer to eat. The obtained results are part of the contribution to the determination of the fungal diversity in Morocco, which remains till now incomplete.

Key words: Morocco, Jerada, Basidiomycetes, Tricholomataceae.

INTRODUCTION

The Basidiomycetes and Ascomycetes at the Jerada mine site are not known so far. We began the study on fungi in this site in 2012 [6, 7]. The present work devoted to the study of three species belong to the Family Tricholomataceae, is part of the continued determination of the mycological diversity with respect to this type of habitat. According to the classification of Hibbeett *et al.* [13], the Family Tricholomataceae belongs to the Phylum Basidiomycota, Agaricomycetes Class, Agaricomycetidae Subclass, and Tricholomatales Order. Tricholomataceae are characterized by a central stipe that is not separable from the cap, a fibrous flesh which is neither elastic nor cartilaginous, the spore print is white or pale and the gills are decurrent, adnate or sinuate [4]. This family constitutes a heterogeneous group in which many species are united [14].

MATERIALS AND METHODS

Jerada, located in northeastern Morocco (Fig. 1) includes in the forest of Beni Yaala which is an artificial plantation of Aleppo pine (*Pinus halepensis*), on Red Mediterranean soils, leached, crusty and brown [1]. Jerada city is an anthracite mining located in the foothills of the chain Horsts (Fig. 2 A). The climate is arid to semi-arid and the annual rainfall is 518 mm [3]. Besides its socio-economic role, the forest of Beni Yaala plays an ecological role. Concerning the mycoflora, on craft waste, craft galleries and coal ramps transformed into isohumic soils (Fig.2 B), Mushrooms grow during different periods when climatic conditions become favorable [6,7].

Surveys carried out from October 2011 to March 2012 in the Jerada mine site (forest of Beni Yaala of *Pinus halepensis*) have allowed the harvest of three species of the family Tricholomataceae for the first time in this region. In this site, the basidiocarps were photographed, and some macroscopic details were noted. Then the basidiocarps were taken to the laboratory to complete the macroscopic descriptions, shape, color and other features of the cap and the stipe. This study was complemented by a microscopic description of spores and cuts at the hymenium, the cuticle, flesh and stipe. The size of the cystidia and basidiospores was also measured. Microscopic observations were effected by the tap water. The obtained information was compared to Courtecuisse and Duhem's (2000) and Lachapelle's [17] determination keys, and also to the data published by Heim [12], Malençon and Bertault [19] Romagnesi [21], Gerhardt [9], Gerault [10] and Roux [22].

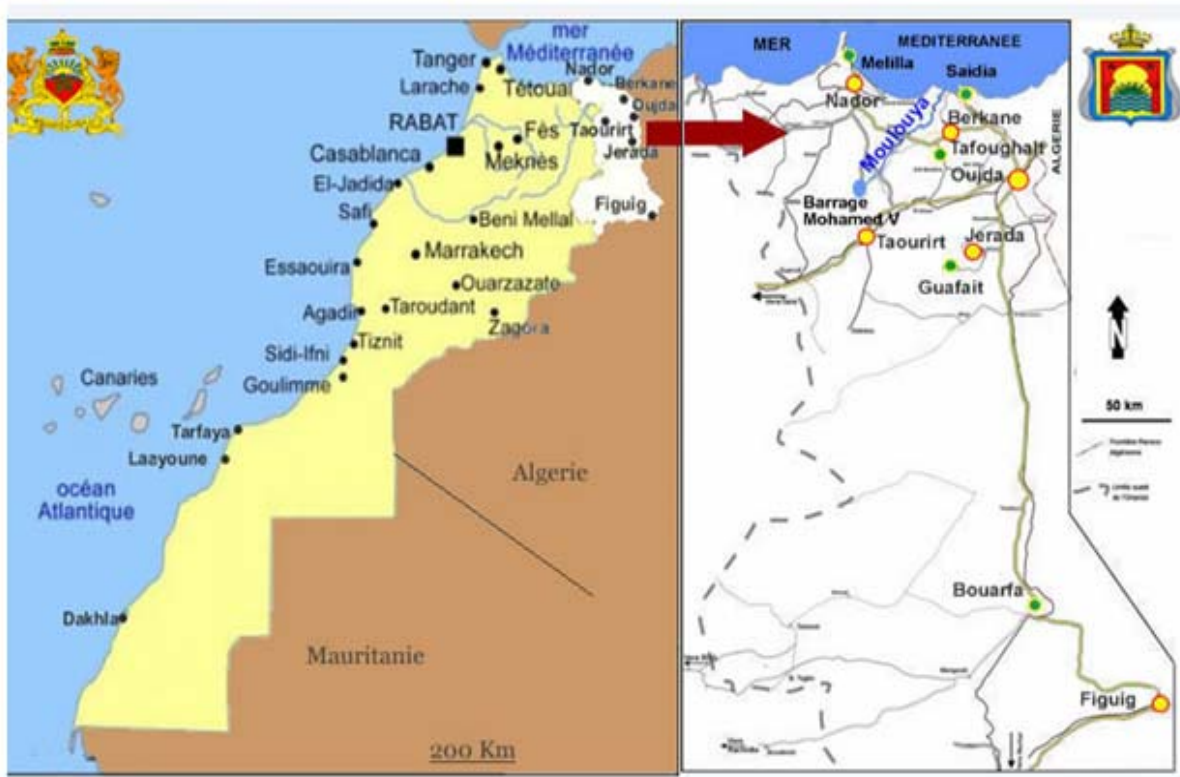


Fig. 1: Location of the study zone in the province of Jerada (Talbi, 2008) [23].



Fig. 2: Overview of the forest of Beni Yaala in Jerada (A), waste of craft coal wells transformed into isohumic soils and on which fungi grow (B).

RESULTS

Three species have been described in this study:

1- *Pseudoclitocybe cyathiformis* (Bull.: Fr) Singer 1956.

Specimens recovered from the pine forest of the Jerada mine site (harvesting of 30th of January, 2012) are solitary and dispersed among the mosses, on peaty soils and needles and small pieces of wood under *Pinus halepensis* (Fig. 3A).

Cap: 1.5 - 6 cm in diameter, centrally depressed becoming funnel-shaped or cup-shaped, glabrous to moisture, slightly radially fibrillose, smooth, non-sticky, hygrophanous, dark brown to dark gray-brown and gray to pale brown, margin of the **cap** is curved, often translucent striated in humidity sometimes crossed (Fig. 3A). **Gills:** adnate but soon deeply decurrent, close to subdistant, narrow to moderately broad, occasionally forked, usually interveined and the faces often veined fibrillose (Fig. 3B). **Stipe:** 2.5-5 x 0.4-1 cm, often quite slender, sometimes eccentric, equal or slightly enlarged at the base, usually curved, ribbed or tablet with age, stuffed then hollow, fibrillose-streaked, the one-colored like cap or paler, glabrous in humidity, often fluffy white and sometimes with white rhizomorphs at the base (Fig. 3B). **Flesh:** thin, pale, brownish con-colored with the cap. Indistinct odour and indistinct flavor. **Print spores:** white.

Basidia: 23-46 x 7-12 μm , 4-spored, sometimes 3, occasionally 1- or 2-spored (Fig. 3D). **Basidiospores:** 7-9.5 x 4.5-6 μm , slightly elliptical to cylindrical, amyloid, smooth, with a slightly grainy appearance inside, hyaline (Fig. 3C). **Cystidia** (pleurocystidia and cheilocystidia) are absent, with the presence of forms that seem to be aborted basidia. **Pileipellis:** 3-7 μm in diameter, dermis as parallel hyphae, tangled, curly, some with nodular growths in brownish epi-membrane pigmentation in with emerging cylindrical terminal cells. **Lamellar trama:** parallel with little presence of loops (Fig. 3D).

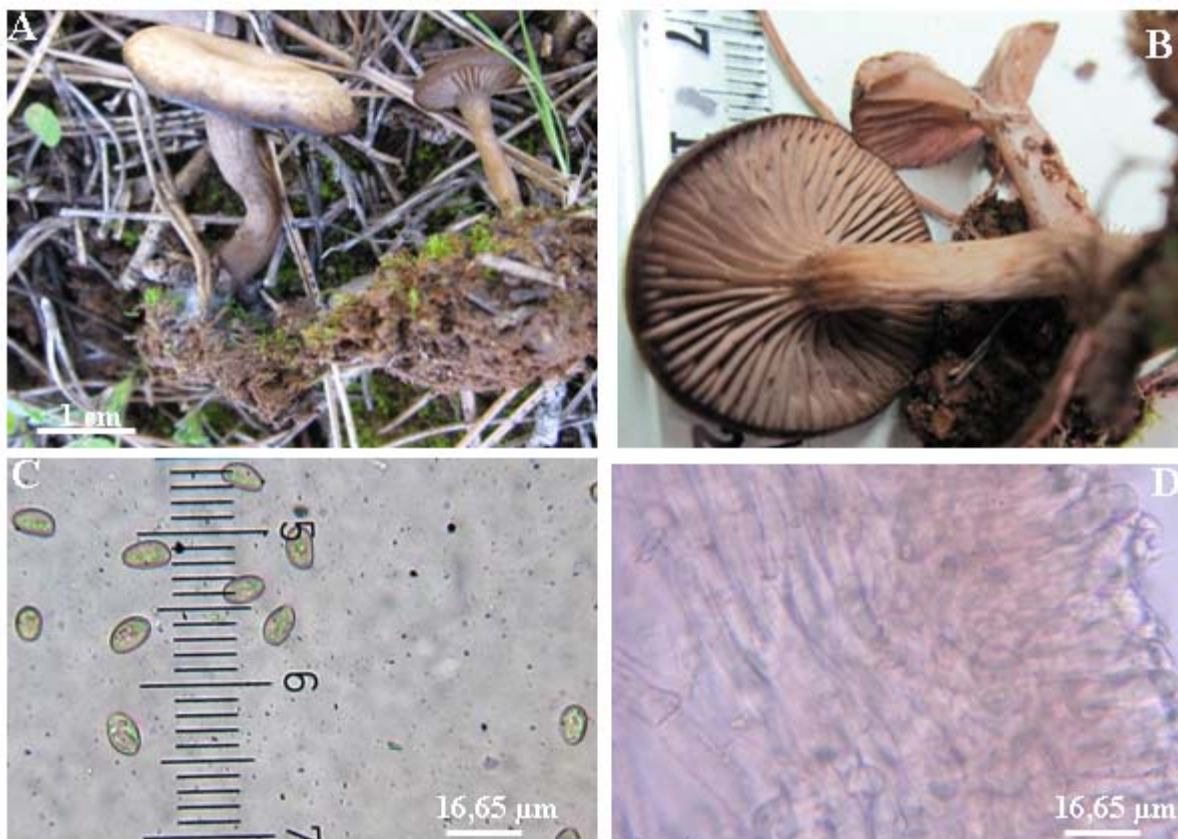


Fig. 3. *Pseudoclitocybe cyathiformis* (Bull. : Fr.) Singer: Two basidiocarps fixed in their substrate (A); basidiocarp with forked gills and longitudinal section showing the color of the flesh and the type of insertion of gills (B); basidiospores (C); Lamellar trama : irregular with presence of loops and tetrasporic basidia (D); the microscopic observations are made in water at 400 x.

2- *Clitocybe cerussata* (Fr.:Fr.) P. Kummer, 1871.

Specimens encountered on December 6th, 2011 in the pine forest of the Jerada mine site are in groups or in tufts on needles and small pieces of wood under *Pinus halepensis* (Fig. 4A).

Cap: 2-6 cm in diameter, white, convex at first, soon plane and hilly then flattened, slightly hollow thereafter, margin wounded for a long time, silky surface, frosted appearance, curved and wavy margin also taking a cream color at full maturity (Fig. 4A).

Gills: white, sinuate at the beginning and then slightly decurrent, cream-colored with age, presence of lamellae and short lamellulae (Fig. 4A). **Stipe:** 2.5-5 x 0.4-0.6 cm, white, often straight and centered, sometimes thin, full at first then hollow, covered with white feathers which agglomerate litter, equal to or slightly wider at the base, stern, fibrillose, white at first, then fibrillose-streaked with age, on white background and then aqueous buff to ochraceous pale, brown and thick tomentum at the base. **Flesh** white (Fig. 4A). **Print spores:** white to whitish. The smell is kind of flour.

Basidia: 23-33 x 4-7 μm , clavate, often 4 sterigmata (Fig. 4B). **Basidiospore:** 5-6 x 3.5-4 μm , taking a form of plum. **Cystidia** are absent. **Lamellar trama:** parallel (Fig. 4). Pileipellis 2.5-3.5 μm in diameter, consisting of hyphae slightly diverticulate, curly, smooth, narrow, 2.5-3.5 μm in diameter with the presence of intracellular pigments.

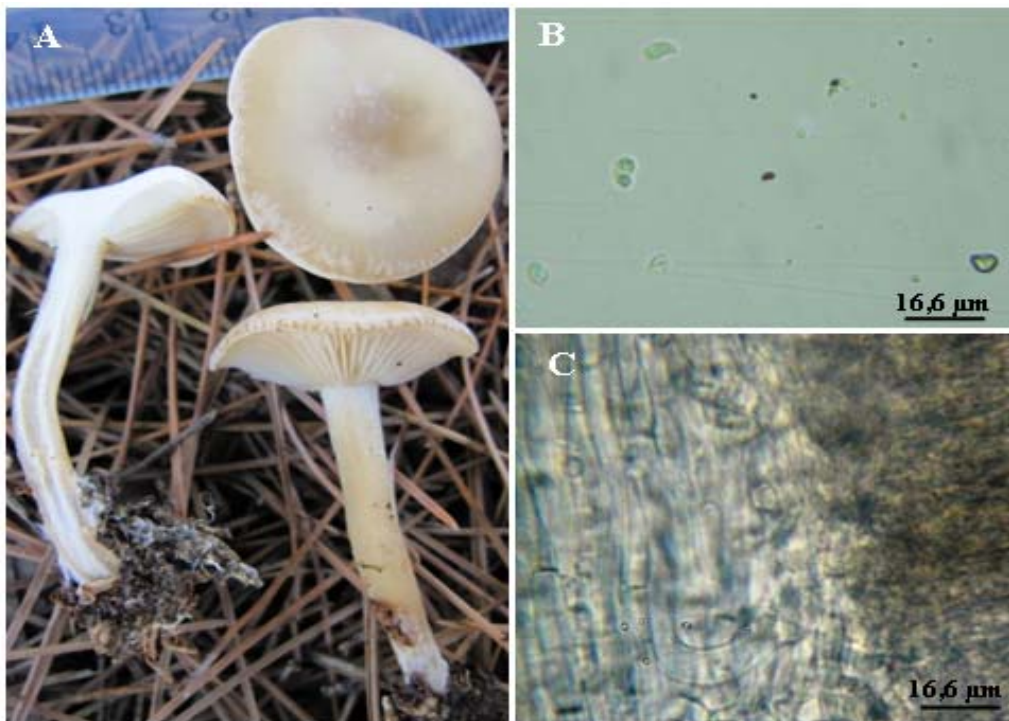


Fig. 4: *Clitocybe cerussata* (Fr.: Fr) P. Kummer 1871 Basidioma and a longitudinal section of a specimen showing the white flesh color, the type of gills insertion and hollow stipe (A); basidiospores (B); the microscopic observations are made in water at x 400.

3-*Tricholoma terreum* (Sch: Fr.) Kummer 1871.

We encountered *Tricholoma terreum* in the forest of Beni Yaala between October and March (2011-2013). Specimens appear solitary or in clump among mosses and needles of *Pinus halepensis*.

Cap, 4-7 cm, across, light to dark grey, conical obtuse, hilly, then convex with a low broad umbo, downy to ferty wavy, margin cap often torn, pellicle of pileus rigid punctato-grabulate, cracking into small squamules when dry (Fig. 5A). **Gills:** white, then cinereous and often tinged with yellow as the fruit body ages, emarginated, sub distant, edge uneven (Fig. 5A).

Stipe: 3 to 6.5 × 1-1.5 cm, cylindraceous slightly, smooth or slightly fibrillose, straight, firm, slightly attenuated, smooth or slightly attenuated at the base, dry, with a cortina in the beginning, dotted with small black squames on the upper part with age. There is no stem ring. **Flesh:** withe, fairly thing. **Print spores:** white. Flavor sweet but becoming a bit bitter in the elderly. Odour/taste, not distinctive.

Spores: 5.5-7.5 × 3.5-4.5 μm, ellipsoidal smooth with a hilar appendage; inamyloid (Fig. 5B). **Basidia** 24-27×7 μm, clavate, elongated, tetraporic, without joint buckles (Fig.5D). **Cystidia** not differentiated (Fig. 5F). **Lamellar trama:** parallel strips and shows parietal pigments, stipe consists of elongated filaments of 4 to 9 μm in diameter, with the presence of many clavate-formed to spindle-shaped cheilocystidia (40-47×4-9μm) (Fig. 5C). Plush consisting of parallel cylindrical filaments, fragmented and uneven in diameter (30-45×5-15μm) (Fig.5E). Epicutis formed by fairly short hyphae.

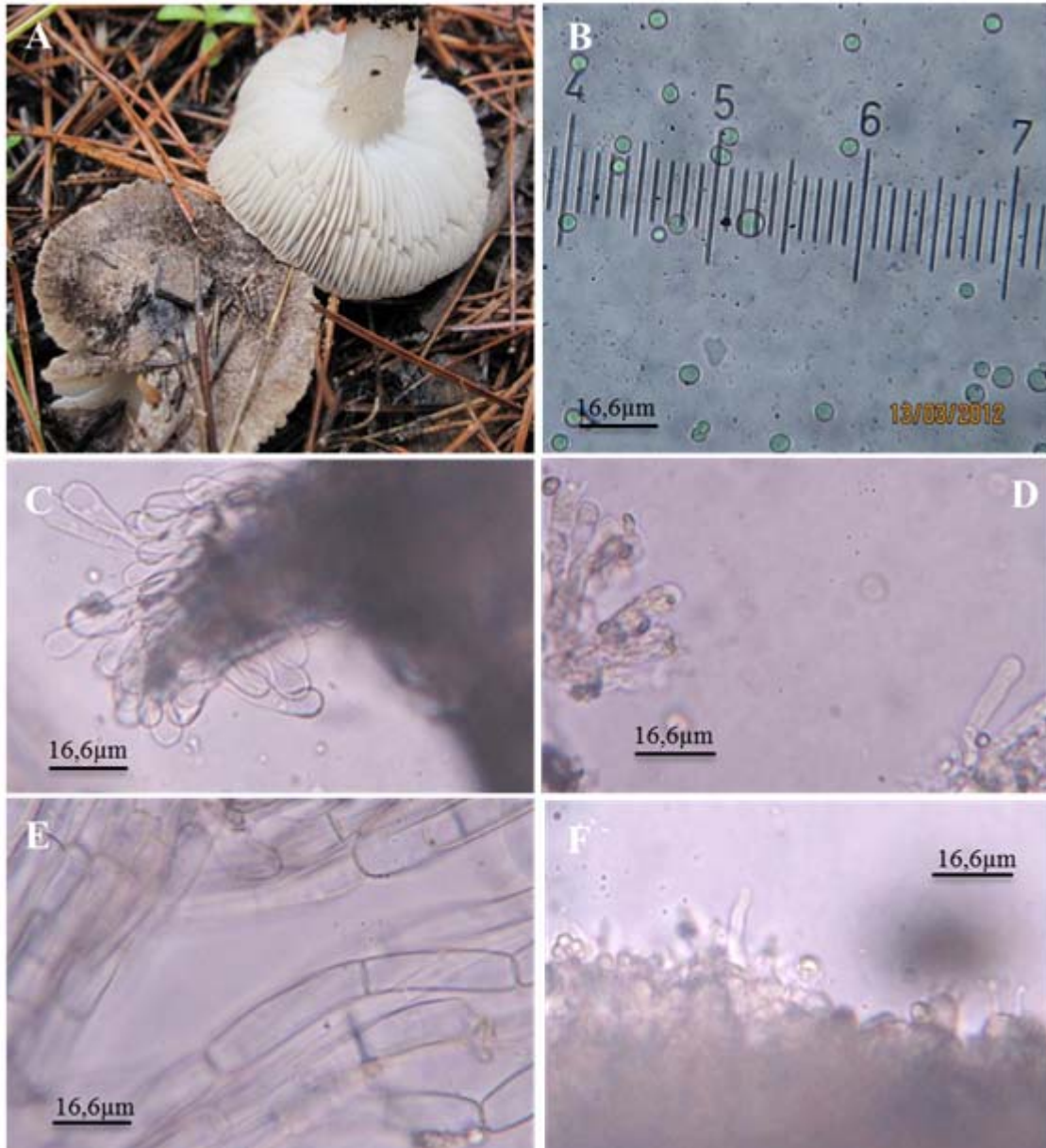


Fig 5. *Tricholom terreum* (Fig.: Fr) Kummer: Basidiocarps and hymenophore with whitish gills (A); microscopic structure of basidiospores (B); microscopic structure of cheilocystidia (C); tetrasporic basidia (D); plush structure (E); bristles of hymenium (F); the microscopic observations are made in water at x 400

Pseudoclitocybe cyathiformis, commonly known as the goblet funnel cap, is a species of fungi in the Tricholomataceae family, and the type of species of the genus *Pseudoclitocybe* (Kirk, 2008). This species, considered rare, was reported in Morocco by Malençon Bertault (1970) in the mountainous regions in autumn: under *Abies pinsapo*, *Cedrus atlantica* and *Pinus pinnaster* (Rif: Azib de Ketama, Bab Bassene, Issaguene, Talassentane) and under *Quercus* (Middle Atlas: Ifrane, Jbel Outka and col de Taililoute).

In this work, the specimen *Pseudoclitocybe cyathiformis* was found for the first time in the pine forest of the Jerada mine site (the 01/30/2012 harvest). They are solitary and scattered among mosses, on peaty soils or needles and small pieces of wood in Aleppo pine.

The given description for *Pseudoclitocybe cyathyformis* harvested in Morocco is identical to that given in the literature [9, 10, 22], with the exception of habitat and the presence of several loops observed at the level of the filaments of lamellar trama. *Pseudoclitocybe obbata* (Fr.) Singer, cited by Malençon & Bertault [19] is closer to *Pseudoclitocybe cyathyformis*, which is characterized by:

- Cap 3-5 cm, deeply curved, with a sooty and fluted flexuous margin, smooth, brown, chocolate brown. The color of the room is a little paler than the cap.
- Gills Steep, little tight, chocolate brown.
- Stipe curved, brown, hollow, slightly fibrillose, silky, 6-8 x 0.6-1 cm.
- Pale brownish flesh and low odor or odorless cyanic.
- Spores 8-9 x 6-7 µm, broadly elliptical (Gerault, 2005).

These characters do not match perfectly with those previously cited of *Pseudoclitocybe cyathyformis*, especially the shape, the color of the cap and stipe, the shape of the spores and the absence of granules inside them (interesting character).

Since its inception in 1792, *P. cyathiformis* was renamed several times: *Agaricus aithopus* Holmsk., Beata Ruris Otia Fungis Danicis 2: 69, tab. 41 (1799) = *Agaricus cinerascens* Batsch, Elench. fung., cont. prim. (Halle): 125, tab. 19:101 (1786) = *Agaricus cyathiformis* Bull., Herb. Fr. 12: tab. 575 (1792) = *Agaricus cyathiformis* var. *cinerascens* (Batsch) Fr., Epicr. syst. mycol. (Upsaliae): 74 (1838) [1836-1838] = *Agaricus rufolamellatus* Bull., Herb. Fr. 12: tab. 568 (1792) = *Agaricus sordidus* Bolton, Hist. fung. Halifax (Huddersfield) 2: 59 (1788) = *Agaricus tardus* Pers., Syn. meth. fung. (Göttingen) 2: 461 (1801) = *Agaricus tardus* subsp. *cinereus* Pers., Mycol. eur. (Erlanga) 3: 81 (1828) = *Agaricus tardus* Pers., Syn. meth. fung. (Göttingen) 2: 461 (1801) subsp. *Tardus* = *Agaricus tardus* var. *aggregatus* Pers., Mycol. eur. (Erlanga) 3: 80 (1828) = *Agaricus tardus* var. *aithopus* (Holmsk.) Pers., Mycol. eur. (Erlanga) 3: 80 (1828) = *Agaricus tardus* var. *rufolamellatus* (Bull.) Pers., Syn. meth. fung. (Göttingen) 2: 461 (1801) = *Agaricus tardus* Pers., Syn. meth. fung. (Göttingen) 2: 461 (1801) var. *tardus* = *Agaricus tardus* var. *unicolor* Alb. & Schwein., Consp. fung. (Leipzig): 221 (1805) = *Cantharellula cyathiformis* (Bull.) Singer, Anns mycol. 34(4/5): 331 (1936) = *Clitocybe cinerascens* (Batsch) Sacc., Syll. fung. (Abellini) 5: 177 (1887) = *Clitocybe cyathiformis* (Bull.) P. Kumm., Führ. Pilzk. (Zerbst): 120 (1871) = *Clitocybe cyathiformis* f. *americana* Kauffman, Pap. Mich. Acad. Sci. 8: 192 (1928) [1927] = *Clitocybe cyathiformis* (Bull.) P. Kumm., Führ. Pilzk. (Zerbst): 120 (1871) f. *cyathiformis* = *Clitocybe cyathiformis* f. *maxima* Killerm., Pilze aus Bayern, Kritische Studien besonders zu M. Britzelmayr; Standortsangaben u.(kurze) Bestimmungstabellen: I. Teil: Theleporaceen, Hydnoneen, Polyporaceen, Clavariaceen und Tremellaceen 18: 68 (1930) = *Clitocybe cyathiformis* var. *cinerascens* (Batsch) P. Karst., Bidr. Känn. Finl. Nat. Folk 32: 77 (1879) = *Clitocybe cyathiformis* (Bull.) P. Kumm., Führ. Pilzk. (Zerbst): 120 (1871) var. *cyathiformis* = *Omphalia cyathiformis* (Bull.) QuéL., Mém. Soc. Émul. Montbéliard, Sér. 2 5: 129 (1872) = *Omphalia tarda* (Pers.) Gray, Nat. Arr. Brit. Pl. (London) 1: 614 (1821).

Clitocybe cerussata belongs to the Family of Tricholomataceae, order of Agaricales, Sub-Class of Agaricomycetidae, Class of Agaricomycetes, Sub-division of Agaricomycotina, Phylum of Basidiomycota [16], Tribe of Clitocybeae, Genre of *Clitocybe*. Sub-Genre disciformis. Section of Candicantes, Sub-Section of Phyllophilae [22]. *Clitocybe cerussata* was harvested for the first time under *Pinus pinea* by Malençon & Bertault [18] in Malabata near to Tangier, in December 1975. We encountered this species in December 2011, under *Pinus halepensis* in the forest of Beni Yaala. Specimens grows on the needles of several species of the genus *Pinus*.

Clitocybe cerussata is very close to *C. phyllophila* and share almost the same characteristics. Both species are considered by Gerhardt (2004) as synonyms. While for Roux (2006), these two species are different. *C. phyllophila* has white lamellae gills cream-rosed reflections, lower odor, and is found in hardwoods. Its spores are smaller (4-5 x 3.5-4 microns) (Gerault, 2005).

Like all species of the "candicantes" section *C. cerussata*, are highly toxic (Roux, 2006). This species is also renamed several times since its inception in 1821: *Agaricus cerussatus* Fr., Syst. mycol. (Lundae) 1: 92 (1821) = *Agaricus cerussatus* Fr., Syst. mycol. (Lundae) 1: 92 (1821) var. *cerussatus* = *Agaricus cerussatus* var. *difformis* (Schumach.) Fr., Syst. mycol. (Lundae) 1: 93 (1821) = *Agaricus cerussatus* var. *obtextus* (Lasch) Fr., Epicr. syst. mycol. (Upsaliae): 62 (1838) [1836-1838] = *Agaricus difformis* Schumach, Enum. pl. (Kjbenhavn) 2: 335 (1803) = *Agaricus monstrosus* Sowerby, Col. fig.

Engl. Fung. Mushr. (London) 3: pl. 283 (1800) = *Agaricus obtextus* Lasch, Linnaea 3: 378 (1828) = *Agaricus phyllophilus* Pers., Syn. meth. fung. (Göttingen) 2: 457 (1801) = *Agaricus phyllophilus* var. *fuliginatus* Pers., Mycol. eur. (Erlanga) 3: 72 (1828) = *Agaricus phyllophilus* Pers., Syn. meth. fung. (Göttingen) 2: 457 (1801) var. *phyllophilus* = *Agaricus pithyophilus* Fr., Epicr. syst. mycol. (Upsaliae): 62 (1838) [1836-1838] = *Clitocybe cerussata* (Fr.) P. Kumm., Führ. Pilzk. (Zerbst): 122 (1871) = *Clitocybe cerussata* (Fr.) P. Kumm., Führ. Pilzk. (Zerbst): 122 (1871) var. *cerussata* = *Clitocybe cerussata* var. *difformis* (Schumach.) Lincoff & Mitchel, (1977) = *Clitocybe cerussata* var. *monstrosa* (Cooke) Singer = *Clitocybe cerussata* var. *pithyophila* (Fr.) J.E. Lange, Fl. Agaric. Danic. 1: 79 (1935) = *Clitocybe difformis* (Schumach.) Sacc., Syll. fung. (Abellini) 5: 154 (1887) = *Clitocybe monstrosa* Cooke, Forsch. PflKr., Tokyo: 53 (1883) = *Clitocybe obtexta* (Lasch) Sacc., Syll. fung. (Abellini) 5: 154 (1887) = *Clitocybe phyllophila* f. *difformis* (Schumach.) Raithelh., Metrodiana 1(1): 13 (1970) = *Clitocybe phyllophila* (Pers.) P. Kumm., Führ. Pilzk. (Zerbst): 122 (1871) f. *phyllophila* = *Clitocybe phyllophila* f. *sericea* Raithelh., Metrodiana 1(1): 13 (1970) = *Clitocybe phyllophila* var. *fusispora* Raithelh., Metrodiana 1(1): 11 (1970) = *Clitocybe phyllophila* (Pers.) P. Kumm., Führ. Pilzk. (Zerbst): 122 (1871) var. *phyllophila* = *Clitocybe phyllophila* var. *pseudonebularis* (Raithelh.) Raithelh., Metrodiana 1(1): 12 (1970) = *Clitocybe phyllophila* var. *tenuis* Harmaja, (1969) = *Clitocybe pithyophila* (Fr.) Gillet, Hyménomycètes (Malençon): 152 (1874) [1878] = *Lepista phyllophila* (Pers.) Harmaja, Karstenia 15: 15 (1976) = *Omphalia cerussata* (Fr.) Quél., (1886). *Tricholoma terreum* is a species belonging to the order of Agaricales, Family of Tricholomataceae, Sub-Family of Tricholomatoideae, Genre of Tricholoma, Sub-Genre of Tricholoma, Terrea Section [22]. It was reported by Malençon & Bertault (1975) in autumn and winter; all cork forests of the coastal plateau, from Casablanca to Tangier, under *Pinus* sp. (Skhour-Rehamna and Fqih Ben Saleh); under *Abies pinsapo*, *Cedrus*, *Pinus halepensis* and *Pinus pinaster* (Rif); under *Cedrus*, (Tazekka) and under *Cedrus*, *Pinus pinaster* and *Quercus rotundifolia* (Middle Atlas). Three species are close to *Tricholoma terreum*: *T. triste* that comes in hardwood and characterized by a more or less squames cap and a stipe with a brown gray middle zone; *T. gausapatum* has a very shaggy wood cap, and very large gills and *T. myomyces* is characterized by a flatter cap, with a light gray color [22]. Some authors have found that *T. myomyces* and *T. terreum* are two different species [22], while others consider them as a same species [10].

In a list published by the United Nation Food and Agriculture Organization, *Tricholoma terreum* is reported among the species of useful wild mushrooms (edible and medicinal uses) [15]. It is considered edible in China, Brazil, Spain, Russia, Turkey, Ukraine and Bulgaria (Iqbal, 1995). *Tricholoma terreum* is also renamed several times since its inception: *Agaricus madreporius* Batsch: tab. 36, fig. 203 (1789) = *Agaricus myomyces* Pers., Neues Mag. Bot. 1: 100 (1794) = *Agaricus myomyces* Pers., Neues Mag. Bot. 1: 100 (1794) subsp. *Myomyces* = *Agaricus myomyces* subsp. *myosinus* Pers., Mycol. eur. (Erlanga) 3: 203 (1828) = *Agaricus myomyces* var. *albescens* Pers., Mycol. eur. (Erlanga) 3: 202 (1828) = *Agaricus myomyces* var. *albogriseus* Pers., Mycol. eur. (Erlanga) 3: 203 (1828) = *Agaricus myomyces* var. *communis* Alb. & Schwein., Consp. fung. (Leipzig): 174 (1805) = *Agaricus myomyces* var. *madreporius* (Batsch) Pers., Syn. meth. fung. (Göttingen) 1: xix (1801) = *Agaricus myomyces* Pers., Neues Mag. Bot. 1: 100 (1794) var. *myomyces* = *Agaricus myomyces* var. *myomyces-alter* Fr., Syst. mycol. (Lundae) 1: 44 (1821) = *Agaricus myomyces* var. *rubroguttatus lasch*, Linnaea 3: 159 (1828) = *Agaricus pullus* Batsch, Elench. fung., cont. prim. (Halle): 47 (1783) = *Agaricus terreus* Schaeff., Fung. bavar. palat. nasc. (Ratisbonae) 1: tab. 28 (1762) = *Agaricus terreus* var. *chrysites* Fr., Epicr. syst. mycol. (Upsaliae): 35 (1838) [1836-1838] = *Agaricus terreus* Schaeff., Fung. bavar. palat. nasc. (Ratisbonae) 1: tab. 28 (1762) var. *terreus* = *Gymnopus myomyces* (Pers.) Gray, Nat. Arr. Brit. Pl. (London) 1: 608 (1821) = *Tricholoma bisporigerum* J.E. Lange, Dansk bot. Ark. 8(no. 3): 20 (1933) = *Tricholoma myomyces* (Pers.) J.E. Lange, Dansk bot. Ark. 8(no. 3): 21 (1933) = *Tricholoma myomyces* f. *argentatum* Bon, Docums Mycol. 18(no. 72): 63 (1988) = *Tricholoma myomyces* f. *bisporigerum* (J.E. Lange) Bon, Docums Mycol. 5(no. 18): 131 (1975) = *Tricholoma myomyces* (Pers.) J.E. Lange, Dansk bot. Ark. 8(no. 3): 21 (1933) f. *myomyces* = *Tricholoma myomyces* var. *cystidiotum* Shanks, Mycologia 88(3): 503 (1996) = *Tricholoma myomyces* (Pers.) J.E.

Lange, Dansk bot. Ark. 8(no. 3): 21 (1933) var. = *Myomyces* = *Tricholoma terreum* var. *aetnense* Bacc., in Scalia, Atti Accad. Giorn. di Sci. Natur., Catania, IV 13: 19 (1900) = *Tricholoma terreum* var. *bresadolae* Sacc., Fl. ital. crypt. 1 14): 130 (1915) = *Tricholoma terreum* var. *fragrans* Peck, Ann. Rep. N.Y. St. Mus. 44: 162 (1891) = *Tricholoma terreum* var. *gracilior* Peck, (1895) = *Tricholoma terreum* (Schaeff.) P. Kumm., Führ. Pilzk. (Zerbst): 134 (1871) var. *terreum*. Sacc., Fl. ital. crypt. 1 14): 130 (1915) = *Tricholoma terreum* var. *fragrans* Peck, Ann. Rep. N.Y. St. Mus. 44: 162 (1891) = *Tricholoma terreum* var. *gracilior* Peck, (1895) = *Tricholoma terreum* (Schaeff.) P. Kumm., Führ. Pilzk. (Zerbst): 134 (1871) var. *terreum*.

In order to re-classify the Agaricales based on phylogeny, Matheny *et al.* [20], in a large scale study, have used nucleic acid sequences, representing six genes from regions of 238 species belonging to 146 genres. According to these authors, most of the tested species can be grouped into six clades nominated Agaricoïde, Tricholomatoïde, Marasmioïde, Pluteoïde, Hygrophoroïde and Plicaturopsidoïde. The clade Tricholomatoïde is subdivided into three families: Tricholomataceae, Entolomataceae and Lyophyllaceae. The Tricholomataceae are divided into two tribes, Tricholomateae and Clitocybeae [20]. Many species of fungal populations have suffered a sharp decrease and become increasingly rare [2]. This can be explained by various factors, including climate, soil type, without forgetting the human action. Thus, the exaggerated number and the duration time of the animal's residence (especially cattle) directly or indirectly lead to an alteration of the capital by acting on the mycological distribution [8]. The pinewood of the Jerada mine site is quite degraded, but the harvest of these three species of Basidiomycetes fungi have an important and a diverse roles (edible, medicinal, etc.), which show that this site still has some very interesting potential. Indeed, this work contributes to better know the diversity of fungal populations in this region and to supplement the inventory of local macromycetes mushrooms of Jerada and those of Morocco.

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