



BIBLIOGRAPHIC CATALOG OF ENDEMIC OR RARE MUSHROOMS OF MOROCCO.

Saifeddine El Kholfy, Abdelkrim El-Assfour, Amina Ouazzani Touhami, Nadia Belahbib, Rachid Benkirane and Allal Douira

Laboratoire de Botanique et de Protection des Plantes, UFR de mycologie, Université Ibn Tofail, B.P. 133, Faculté des sciences, Kénitra, Morocco.

ABSTRACT. An inventory of the endemic and rare fungi of Morocco is compiled from literature. 251 species with the reduced area are listed. 14 are endemic, 3 endemic Morocco- Mediterranean, 57 very rare, 116 rare, 18 fairly rare and 44 not very frequent.

Key words: Morocco, inventory, fungi, endemic, rare.

INTRODUCTION

In Morocco, the most important areas for plants (ZIP) are divided into 57 sites according to a preliminary list established in 2004 [7]. These sites are important by the diversity and originality of their wild flora which must be protected and managed. This flora includes obviously the vascular plants, bryophytes, lichens, algae and the fungi. The Moroccan forests are very significant habitats for the development of fungi. They shelter a significant number of endemic species, some of which are unfortunately heavily exploited by local populations, at the example: *Boletus mamorensis* endemic in the Mamora forest [25]. The climatic conditions, destruction of habitats, overgrazing and installation of exotic forest plantations cause embrittlement, the ecosystems degradation or disappearance which leads irreparably to the species disappearance [1].

The present work is a first step before the completion of the national red list of the threatened fungal species. It is based on old data as the monitoring of species has not been done since the 1980s. The information are given in the form of a list containing the area of distribution and ecology of each species.

The taxa highlighted not listed in the 9th edition of Dictionary of the Fungi [9].

Abbreviations

[T₁]. Tome 1

[T₂]. Tome 2

[fasc. 1, t. 94] : Bull. Soc. Myc. FR. t. 94, fasc. 1, 1978. Russules du Maroc.

[fasc. 3, t. 96] : Bull. Soc. Myc. FR. t. 96, fasc. 3, 1980. Amanites du Maroc.

[fasc. 3, t. 95] : Bull. Soc. Myc. FR. t. 95, fasc. 3, 1979. Bolets du Maroc.

[fasc. 3, t. 94] : Bull. Soc. Myc. FR. t. 94, fasc. 3, 1978. Lactaire du Maroc.

(): the name of family is mentioned after each species.

The endemic species of Morocco

**Coprinus heterocomus* Malençon, (1970), (= *Coprinopsis heterocoma* (Malençon) Redhead, Vilgalys & Moncalvo, 2001); on layers of horse manure, garden of Rabat, [T₁]. (Psathyrellaceae)

**Clitocybe flaccida* var. *fibrillosa* Malençon, (1975), (= *Lepista flaccida* (Sowerby) Pat., 1887); in the Middle Atlas cedars, [T₂]. (Tricholomataceae)

**Boletus mamorensis* Redeuilh, (1978); under *Q. suber* in Mamora, [fasc. 3, t. 95]. (Boletaceae).

- **Crepidotus microcarpus* Malençon, (1975); on dead branches of *Cytisus battandieri* in the Middle Atlas, [T₂]. (Inocybaceae)
- **Exobasidium hesperidum* Maire, (1917), (= *Muribasidiospora hesperidum* (Maire) Kamat & Rajendren, 1968); on *Rhus oxyacanthus*, *R. pentaphylla*, Great Atlas, [Maire & Werner]. (Exobasidiaceae)
- **Helvella maroccana* Har. & Pat., (1904); surroundings of Tangier, [Maire & Werner]. (Helvellaceae)
- **Marasmius scorodonius* var. *virgultorum* Malençon & Bertault, (1975), (= *Mycetinis scorodonius* (Fr.) A.W. Wilson & Desjardin, 2005); on twigs: *Rubus*, *Viburnum*, *Erica* at Tanger, [T₂]. (Omphalotaceae)
- **Mycena epipterygia* var. *atroviscosa* Malençon, (1989), (= *Mycena epipterygia* (Scop.) Gray, 1821); only in mountain: Middle Atlas and Rif, [T₂]. (Mycenaceae)
- **Panellus melleo-ochraceus* Malençon, (1975); on fallen branches of *Q. faginea* of Middle Atlas, [T₂]. (Mycenaceae)
- **Pleurotus dryinus* var. *luteosaturatus* Malençon, (1975), (= *Pleurotus luteosaturatus* (Malençon & Bertault) P.-A. Moreau, 2009); on cedar's stem, Middle Atlas [T₂]. (Pleurotaceae)
- **Ramaria cedretorum* var. *maroccana* Werner; under the Cedars of Middle Atlas, [Maire & Werner]. (Gomphaceae)
- **Resupinatus physaroides* Malençon, (1975); on living trunks of *Juniperus oxycedrus*, Middle Atlas, [T₂]. (Tricholomataceae)
- **Russula alutacea* var. *brunneola* Bertault, (1978), (= *Russula alutacea* (Fr.) Fr., 1838); under *Pinus pinea*, near Tanger, [fasc. 1, t. 94]. (Russulaceae)
- **Tricholoma saponaceum* f. *carneifolium* Bertault, (1978); under *Eucalyptus globulus* at Tanger, [T₂]. (Tricholomataceae)

Endemic species Morocco- Mediterranean

- **Amanita eliae* f. *griseovelata* Bertault, (1965), (= *Amanita eliae* Quél, 1872); at Tanger. Homotype: *Amanita eliae* var. *griseovelata* (Bertault) Migliozi. & Camboni (2000), France. (Amanitaceae)
- **Clitocybe amoenolens* Malençon, (1975), (= *Paralepistopsis amoenolens* (Malençon) Vizzini, 2012); in pure or mixed cedar forests of *Q. ilex* and *Ilex aquifolium* of Middle Atlas, [T₂], France and Italie, Neville & Poumarat, (1998). (Tricholomataceae)
- **Russula seperina* var. *luteovirens* Bertault & Malençon, (1978), (= *Russula amoena* Quél, 1881); under *Q. suber* and *Q. ilex* in the Middle Atlas and Tanger, [fasc. 1, t. 94], and Spain. A. Estexe-Raxentòs (2005). (Russulaceae)

The very rare species

- **Amanita curtipes* E.-J. Gilbert, (1941); under *Q. Suber*, but very common in some years, from Tanger to Rabat, [fasc.3, t. 96]. (Amanitaceae)
- **Amanita inaurata* Secr. ex Gillet, (1874); in Plain (Tangérois), between Tanger and Asilah, [T₁]. (Amanitaceae)
- **Amanita lividopallescens* (Secr. ex Boud.) Kühner & Romagn., (1953); in the Rif under *Abies pinsapo* mixed of *Q. faginea* and Middle Atlas, [T₁]. (Amanitaceae)
- **Bolbitius reticulatus* (Pers.) Ricken, (1915); on *Q. faginea*' rotting wood of Moyen Atlas, [T₁]. (Bolbitiaceae)
- **Boletus fechtneri* Velen, (1922); rare, under *Q. suber* of Tanger, [fasc. 3, t. 95]. (Boletaceae)
- **Boletus satanas* Rostk, (1838), Lenz, (1831); under *Q. faginea* near Tanger and Middle Atlas, [fasc. 3, t. 95]. (Boletaceae)
- **Boletus fragrans* Vittad, (1835); under *Q. suber* in the Mamora and Tanger, [fasc. 3, t. 95]. (Boletaceae)
- **Campanella conchata* (Velen.) Romagn, (1981), (= *Arrhenia retiruga* (Bull.) Redhead, 1984); on culms of a permanent grass, Tanger, [T₂]. (Tricholomataceae)
- **Cantharellus lutescens* var. *bisporus* Bertault, (1975), (= *Craterellus lutescens* (Fr.) Fr., 1838); under *Pinus pinea* in Tanger, [T₂]. (Cantharellaceae).

- **Cantharellus sinuosus* Saut, (1841), Fr. (1821), (= *Pseudocraterellus undulatus* (Pers.) Rauschert, 1987); near Tanger under *Eucalyptus* and *Quercus* & near Larache under *Q. suber*, [T₂]. (Cantharellaceae)
- **Clitocybula lenta* (Maire) Malençon & Bertault, (1975), (= *Leucoinocybe lenta* (Maire) Singer, 1943); quite common in the coastal Meseta on *Q. suber*, much rarer in the north, [T₂] (Tricholomataceae)
- **Clitopilus caelatus* (Fr.) Vila & Contu, (2009), (Fr.) Kühner & Romagn. (1953), (= *Rhodocybe caelata* (Fr.) Maire, 1926); in a maquis at burned Cistes in the Rif, [T₂]. (Entolomataceae)
- **Clitopilus mundulus* (Lasch) P. Kumm. (1871), (= *Rhodocybe popinalis* (Fr.) Singer, 1951); in clear coppice at *Q. suber*, in the Rif, [T₂]. (Entolomataceae)
- **Collybia fusipes* (Bull.) Quél., (1872), (= *Gymnopus fusipes* (Bull.) Gray, 1821); limited to Rif on strains of *Q. pyrenaica*, [T₂]. (Omphalotaceae)
- **Collybia tuberosa* (Bull.) P. Kumm., (1871), signaled only in the Middle Atlas, [T₂]. (Tricholomataceae)
- **Coprinus disseminatus* (Pers.) Gray, (1821); on *Q. suber* near Tanger, in the Rif, on *Salix* sp. in the Middle Atlas, and *Q. ilex* in the Haut Atlas, [T₁]. (Psathyrellaceae)
- **Cortinarius prasinus* (Schaeff.) Fr., (1838); Cedars of Middle Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius scaurus* (Fr.) Fr., (1838); under *Q. ilex* in the Middle Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius alboviolaceus* (Pers.) Fr., (1838); under *Q. ilex*, in the Middle Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius argentatus* (Pers.) Fr., (1838), sensu Kauffmann, (= *Cortinarius argenteopileatus* Nezdobjm, 1983); in mixed forest of *Q. ilex* and *Cedrus* of Middle Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius anomalus* (Fr.) Fr., (1838); in coastal forests, under *Q. suber* of Mamora, [T₁]. (Cortinariaceae)
- **Cortinarius candelaris* Fr., (1838), sensu auct. mult, (= *Cortinarius rigens* (Pers.) Fr., 1838); under hardwoods of Middle Atlas, Tanger and the Rif, [T₁]. (Cortinariaceae)
- **Cortinarius semisanguineus* (Fr.) Gillet, (1876); under the *Eucalyptus* & the *Quercus*, near Tanger, [T₁]. (Cortinariaceae)
- **Dryophila albocrenulata* Peck, (1873); on a dead trunk of *Abies pinsapo*, Rif, [T₁]. (Strophariaceae)
- **Dryophila aurivella* (Batsch) Quél., (1886), (= *Pholiota aurivella* (Batsch) P. Kumm., 1871); on living trunk of *Abies pinsapo*, Rif, [T₁]. (Strophariaceae)
- **Drosophila velutina* (Pers.) Kühner & Romagn, (1953), (= *Lacrymaria lacrymabunda* (Bull.) Pat., 1887), under *Q. faginea* accompanied with *Acer monspessulanum* and *Ilex aquifolius* of Middle Atlas, [T₁]. (Strophariaceae)
- **Gyroporus cyanescens* (Bull.) Quél, (1886); under *Q. suber* at Tanger, [fasc. 3, t. 95]. (Gyroporaceae)
- **Gymnopilus suberis* (Maire) Singer, (1951); on *Q. suber*' trunks of Mamora, Tanger and the Rif, [T₁]. (Strophariaceae)
- **Hygrophorus var. insipidus* (J.E. Lange) S. Lundell, (1923); under *Cedrus* of Middle Atlas, [T₂]. (Hygrophoraceae)
- **Inocybe pyriodora f. incarnata* (Bres.) Nespiak, (1990), (= *Inocybe incarnata* Bres., 1884); under *Q. suber* near Tanger, under *Q. ilex* of Middle Atlas, [T₁]. (Inocybaceae)
- **Inocybe pyriodora var. scabra* Kühner, (1953), (= *Inocybe erinaceomorpha* Stangl & J. Veselský, 1979); a harvest in Mamora forest, towards El-Manzeh, [T₁]. (Inocybaceae)
- **Laccaria proxima var. bicolor* (Maire) Kühner & Romagn, (1953), (= *Laccaria bicolor* (Maire) P.D. Orton, 1960); among Cistes, strictly limited at around of Tanger, [T₂]. (Hydnangiaceae)
- **Lactarius camphoratus* (Bull.) Fr., (1838); at Tanger and Middle Atlas, [fasc. 3, t. 94]. (Russulaceae)
- **Lepista glaucocana* (Bres.) Singer, (1951); scrub and woodland of hardwoods and conifers, Gharb, Tanger and Middle Atlas, [T₂]. (Tricholomataceae)
- **Lepista saeva* (Fr.) P.D. Orton, (1960), (= *Lepista personata* (Fr.) Cooke, 1871); in the forest of Middle Atlas (Azrou), [T₂]. (Tricholomataceae).

- **Lentinus tigrinus* (Bull.) Fr., (1825); on *Populus euamericana* var. *robuta*, Rabat, [T₂]. (Polyporaceae)
- **Lentinellus vulpinus* (Sowerby) Kühner & Maire (1934); on the surface of sawing a Log band decaying of *Abies pinsapo*, in the Rif, [T₂]. (Auriscalpiaceae)
- **Lepiota echinella* Quél. & G.E. Bernard, (1888); Tanger, approx of Rabat under *Q. Suber*, Middle Atlas under *Q. ilex*, [T₁]. (Agaricaceae)
- **Marasmius candidus* Fr., (1838), sensu Lange, (= *Marasmiellus vaillantii* (Pers.) Singer, 1973); on hanging twigs of *Phillyrea angustifolia*, *Acacia lollissima*, *Pistacia lentiscus*, Tanger, [T₂]. (Marasmiaceae)
- **Marasmius globularis* (Weinm.) Fr., (1872), (= *Marasmius wynneae* Berk. & Broome, 1859); rare in mountains, in the Middle Atlas, under the Cedars and *Q. ilex*, but commun somewhere else, [T₂]. (Marasmiaceae)
- **Mycena adonis* (Bull.) Gray, (1821), (= *Atheniella adonis* (Bull.) Redhead, Moncalvo, Vilgalys, Desjardin & B.A. Perry, 2012); among needles and rotting twigs in the cedar forests of Ras El Ma in the Middle Atlas, [T₂]. (Mycenaceae)
- **Mycena flos-nivium* Kühner, (1952); on decomposed trunk of cedar in the Middle Atlas, [T₂]. (Mycenaceae)
- **Mycena margaritifera* Maire, (1938); on living *Juniperus phoenicea* trunk of Es-Saouira, [T₂]. (Mycenaceae)
- **Mycena niveipes* (Murrill) Murrill, (1916); on *Olea* and *Q. suber* at Tanger, on *Q. suber* in the Rif, on *Q. faginea* and *Q. ilex* of Middle Atlas, [T₂]. (Mycenaceae)
- **Mycena pelianthina* (Fr.) Quél., (1872); under *Q. pyrenaica* in the Rif, under *Q. suber* in the Tazekka, under *Q. ilex* in the Middle Atlas, [T₂]. (Mycenaceae)
- **Omphalina obscurata* D.A. Reid, (1958), Kühner ex M. Lange, (1955); on the talus near Tanger, in a stand at *Q. pyrenaica* in the Rif, [T₂]. (Tricholomataceae)
- **Pleurotus ostreatus* f. *cornucopiae* (Paulet) Quél., (1886), (= *Pleurotus cornucopiae* (Paulet) Rolland, 1910); on *Populus* sp. output N 9. of the city of Kenitra, [T₂]. (Pleurotaceae)
- **Psalliota benesii* Pilát (1925), (= *Agaricus benesii* (Pilát) Pilát, 1951); in a wood of *Q. suber*, under *Acacia cyanophylla*, Tanger, [T₁]. (Agaricaceae)
- **Rhodophyllus cancrinus* (Quél.) Quél. 1886, (= *Entoloma neglectum* (Lasch) Arnolds, 1982); on land of a bushy slope of Middle Atlas, [T₁]. (Entolomataceae)
- **Rhodophyllus rugosus* (Malençon) Romagnési.; lawns in Middle Atlas, [T₁]. (Entolomataceae)
- **Rhodopaxillus panaeolus* (Fr.) Maire, (1913), (= *Lepista panaeolus* (Fr.) P. Karst., 1879); forest of Mamora, [Maire & Werner]. (Tricholomataceae)
- **Russula fallax* (Schaeff.) Fr., (1874), (= *Russula fragilis* Fr., 1838); under *Q. suber* near Larache, [fasc. 1. t. 94]. (Russulaceae)
- **Russula seperina* Dupain, (1913); under *Acer monspessulanum* and *Q. ilex* in the Middle Atlas, [fasc. 1. t. 94]. (Russulaceae)
- **Russula virescens* (Schaeff.) Fr., (1836); rarer in coastal Meseta (Mamora) and in the Rif, but commun under the *Eucalyptus*, *Pinus* and *Quercus* near Tanger, [fasc. 1. t. 94]. (Russulaceae)
- **Russula versicolor* var. *intensior* (Cooke) Romagn, (1953), (= *Russula puellaris* Fr., 1838); under *Q. suber* in the Rif, [fasc. 1. t. 94]. (Russulaceae)
- **Russula wernerii* Maire, (1937); among the asphodel and *Cistus* near Tanger, Mamora, [fasc. 1. t. 94]. (Russulaceae)

The rare species

- **Agrocybe dura* (Bolton) Singer, (1936), sensu NCL (1960), auct. mult, (= *Agrocybe molesta* (Lasch) Singer, 1978); lawns, pastures, gardens and crops; Rabat, Azrou and plain of Souss, [T₁]. (Strophariaceae)
- **Amanita aspera* f. *lactella* (E.-J. Gilbert) A.G. Parrot, (1960), (= *Amanita franchetii* (Boud.) Fayod, 1889); under *Q. Suber* near Larache, [fasc. 3. t. 96]. (Amanitaceae).
- **Amanita eliae* Quél. (1872); near Tanger, under *Pinus pinea*, [T₁]. (Amanitaceae).

- **Amanita muscaria* (L.) Lam., (1783); under *Pinus* of Rabat, [Maire & Werner]. (Amanitaceae)
- **Amanita gemmata* (Fr.) Bertill, (1866); in the Rif (Ktama), under *Cedrus* and *Pinus*, rare in the Middle Atlas, but frequent from Tanger to Larache, under *Acacia*, *Eucalyptus* and *Pinus*, [T₁]. (Amanitaceae)
- **Amanita ovoidea* (Bull.) Link, (1833); under *Pinus pinea* in Tanger and under *Pinus halepensis* in the Rif [T₁]. (Amanitaceae)
- **Amanita ponderosa* Malençon & R. Heim, (1944); less frequent near Larache, rare at latitude of Rabat, in the cork forests and plantations (*Eucalyptus*, *Pinus*), [T₁]. (Amanitaceae)
- **Amanita spreata* (Peck) Sacc., (1887); under *Q. suber* of Tanger, [T₁]. (Amanitaceae)
- **Amanita submembranacea* (Bon) Gröger, (1979); near the plantations of *Pinus pinea* in Tangier, [fasc. 3. t. 96]. (Amanitaceae)
- **Amanita umbrinolutea* (Secr. Ex Gillet) Bataille, (1910), (= *Amanita battarrae* (Boud.) Bon, 1985); in the Rif, High Atlas under *Q. suber*, [T₁]. (Amanitaceae)
- **Amanita vittadinii* (Moretti) Vittad, (1826); near Rabat and in the plain of Gharb, but more common in Tangiers, Middle Atlas [T₁]. (Amanitaceae)
- **Bolbitius vitellinus* var. *typicus*; in the prairie grass of *Q. ilex*' woods, High Atlas, on rotting straw in Tanger, [T₁]. (Bolbitiaceae)
- **Bolbitius fragilis* (L.) Fr., (1838), (= *Bolbitius titubans* (Bull.) Fr., 1838); under *Q. ilex* in forest of Middle Atlas, and on rotting debris of *Carex hispide* in Tanger, [T₂]. (Bolbitiaceae)
- **Boletus radicans* Pers., (1801), Rostk, (1838), Gillet, (1878), sensu Rea, (1922), auct, (= *Boletus pulverulentus* Opat, 1836); under *Q. suber* of Tanger, [fasc. 3. t. 95]. (Boletaceae)
- **Boletus satanas* var. *corsicum* ; under *Q. faginea* in Tanger and in the Rif, [fasc. 3. t. 96]. (Bolbitiaceae)
- **Cantharellus cornucopioides* (L.) Fr., (1821), (= *Craterellus cornucopioides* (L.) Pers., 1825); in coastal forests and low mountains in the sets of Morocco (Mamora, Larache, Rif), but abundant near Tanger, [T₂]. (Cantharellaceae)
- **Cantharellus lutescens* Fr. (1821), (= *Craterellus lutescens* (Fr.) Fr., 1838); near Tanger, sous *Pinus insignis* and *P. pinea*, [T₂]. (Cantharellaceae)
- **Clitocybe vermicularis* (Fr.) Quél., (1872); in the cedar forests of the Middle Atlas, under *Pinus pinea* near Tanger, [T₂]. (Tricholomataceae)
- **Clitocybe alexandri* (Gillet) Gillet, (1884), under *Q. faginea*, *Q. ilex* and *Cedrus* in the MiddleAtlas, [T₂]. (Tricholomataceae)
- **Clitocybe ericetorum* (Pers.) Fr., (1872), (= *Lichenomphalia umbellifera* (L.) Redhead, Lutzoni, Moncalvo & Vilgalys, 2002); pastures of the Middle Atlas, grassy glade near Tanger, [T₂]. (Tricholomataceae)
- **Clitocybe lituus* (Fr.) Métrod, (1946); in the maquis at Cysts in the Rif, Myrtle and Arbutus slightly wooded of *Q. suber* in Tanger, under *Pinus pinea* and under *Q. ilex*, [T₂]. (Tricholomataceae)
- **Clitopilus popinalis* (Fr.) P. Kumm., (1871), (= *Rhodocybe popinalis* (Fr.) Singer, 1951); in the Middle Atlas nearby Cedars, [T₂]. (Entolomaceae)
- **Clitopilus pertenuis* Malençon, (1975); on rotting twigs: *Cytisus battandieri*, *Rubus ulmifolius* in the Middle Atlas, on dead trunk of *Tetraclinis articulata* in the maquis of Es-saouira, [T₂]. (Entolomaceae)
- **Collybia xanthophylla* Malençon & Bertault, (1975), (= *Callistosporium luteo-olivaceum* (Berk. & M.A. Curtis) Singer, 1946); on stumps and woody debris of *Pinus insignis* in Tanger, [T₂]. (Tricholomataceae)
- **Coprinus atramentarius* (Bull.) Fr., (1838), (= *Coprinopsis atramentaria* (Bull.) Redhead, Vilgalys & Moncalvo, 2001); at the base of a dead stump (orange) in a garden in Rabat, [T₁]. (Psathyrellaceae)
- **Coprinus gonophyllus* Quél., (1884), (= *Coprinopsis gonophylla* (Quél.) Redhead, Vilgalys & Moncalvo, in Redhead, 2001); on-site coal in the Middle Atlas, [T₁]. (Psathyrellaceae)
- **Cortinarius balteatocumatilis* Rob. Henry, (1939), Rob. Henry ex P.D. Orton (1960), sensu auct. brit., (= *Cortinarius largus* Fr., 1838); under *Q. ilex* in the Rif, [T₁]. (Cortinariaceae).

- **Cortinarius caesiocyaneus* Britzelm, (1895), (= *Cortinarius caerulescens* (Schaeff.) Fr., 1838), sensu Rea (1922), (= *Cortinarius mairei* (M.M. Moser) M.M. Moser, 1967); under the Pines in Tanger, under *Q. suber* in Mamora & under *Q. ilex* in the High Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius caerulescens* W. Saunders & W.G. Sm., (1870), (Schaeff.) Fr., (1838), sensu Marchand, Moser, NCL, (1960) p.p, (= *Cortinarius terpsichores* Melot, 1989); under *Pinus halepensis* in the Rif and under the oaks (Gharb), [T₁]. (Cortinariaceae)
- **Cortinarius caligatus* Malençon, (1970); around the oaks (*Q. ilex*) of Middle Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius cumatilis* Fr., (1838); under the oaks of Mamora, under *Q. faginea* in the Middle Atlas, under *Q. pyrenaica* in the Rif, [T₁]. (Cortinariaceae)
- **Cortinarius delibutus* Fr., (1838); woods of *Pinus* and *Quercus* of the region of Tanger, [T₁]. (Cortinariaceae)
- **Cortinarius dionysae* Rob. Henry, (1933); mixed wood of Tanger and Rabat, in pure or mixed Cedars of *Q. ilex* in the Rif and the Middle Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius emollitus* Fr., (1838); in the oaks of Mamora, under *Q. suber* of Tanger and under *Q. pyrenaica* in the Rif, [T₁]. (Cortinariaceae)
- **Cortinarius largus* Fr., (1838), sensu auct. brit., (= *Cortinarius patibilis* Brandrud & Melot, 1983); under *Q. suber* around Larache, [T₁]. (Cortinariaceae)
- **Cortinarius paramoenolens* Rob. Henry, (1952); under *Eucalyptus* of Tanger and under *Q. suber* near Larache, [T₁]. (Cortinariaceae)
- **Cortinarius azureus* Fr., (1838), (= *Cortinarius anomalus* (Fr.) Fr., 1838); under *Cedrus* and *Q. ilex* of Middle Atlas, [T₁]. (Cortinariaceae)
- **Cortinarius cinnamomeoluteus* P.D. Orton, (1960); mixed wood of Tanger, [T₁]. (Cortinariaceae)
- **Cortinarius scutulatus* (Fr.) Fr., (1838), sensu Cooke [Ill. Brit. Fung. 796 (820) Vol. 6 (1886)], auct. mult., (= *Cortinarius ionophyllus* M.M. Moser, 1968); under *Q. suber* in Mamora, [T₁]. (Cortinariaceae)
- **Cystoderma amianthinum* (Scop.) Fayod, (1889); Azrou forest (*Q. ilex*), [Maire & Werner]. (Agaricaceae)
- **Craterellus cornucopioides* (L.) Pers., (1825); under *Q. suber* in the Mamora, [Maire & Werner]. (Cantharellaceae)
- **Drosophila langei* Malençon, (1970), (= *Psathyrella langei* (Malençon) Contu, 2007); on rotting trunks of *Q. ilex*, in Michliffene (Middle Atals), [T₁]. (Psathyrellaceae)
- **Drosophila spadicea* (P. Kumm.) Quél., (1886), (= *Psathyrella spadicea* (P. Kumm.) Singer, 1951); on *Q. faginea* in Middle Atlas, on *Abies pinsapo* of Rif, [T₁]. (Psathyrellaceae)
- **Dryophila adiposa* (Batsch) Quél., (1886), (= *Pholiota adiposa* (Batsch) P. Kumm., 1871); on Cedars, near Ktama (Rif), [T₁]. (Strophariaceae)
- **Dryophila lenta* (Pers.) Quél. (1886); wet ravines in cedar forest of the Rif, under *Pinus pinaster* in the Middle Atlas, [T₁]. (Strophariaceae)
- **Geophila aeruginosa* (Curtis) Quél., (1886), (= *Clitocybe odora* (Bull.) P. Kumm., 1871); under *Pinus pinaster* in the Rif and Middle Atlas, and mixed forest of *Q. ilex* and *Q. faginea* (Jâba' forest), [T₁]. (Strophariaceae)
- **Geophila atrorufa* (Schaeff.) Quél., (1886), (= *Psilocybe montana* (Pers.) P. Kumm., 1871); nonsignaled substrate in Middle Atlas, [T₁]. (Strophariaceae)
- **Hebeloma edurum* Métrod ex Bon, (1985), (= *Hebeloma laterinum* (Batsch) Vesterh., 2005); under the pines in Tanger and under the pines & under *Abies pinsapo* of Rif, [T₁]. (Cortinariaceae)
- **Hebeloma strophosum* (Fr.) Sacc. (1887); under the Cedars or pines Rif and Middle Atlas, [T₁]. (Cortinariaceae)
- **Hohenbuehelia chevallieri* (Pat.) Pegler, (1966); on decaying stems of *Senecio anteuphorbium* (Tiznite), on dead branch indeterminate in the Rif, [T₂]. (Pleurotaceae)
- **Hygrophorus arbustivus* Fr. (1836); under *Q. ilex* and *Q. lusitanica*, or in the mixed Cedras of Middle Atlas, under *Q. suber* in Tanger & Larache, [T₂]. (Hygrophoraceae).

- **Hygrophorus hypothejus* (Fr.) Fr., (1838); under *Pinus pinea*, near Tanger, [T₂]. (Hygrophoraceae)
- **Hygrophorus penarius* Fr., (1836); signaled in Azrou under the *Q. ilex*, [T₂]. (Hygrophoraceae)
- **Hygrophorus pratensis* (Fr.) Fr., (1836), (= *Cuphophyllus pratensis* (Fr.) Bon, 1985); on a grassy slope in Tanger, [T₂]. (Hygrophoraceae)
- **Hygrophorus psittacinus* (Schaeff.) Fr., (1838), (= *Gliophorus psittacinus* (Schaeff.) Herink, 1958); under *Eucalyptus globulus* in Tanger, [T₂]. (Hygrophoraceae)
- **Hygrophorus reae* Maire, (1910), (= *Hygrocybe mucronella* (Fr.) P. Karst., 1879); clearings woods at Quercus near Tanger, under *Q. pyrenaica* in the Rif, under *Q. ilex* in the Middle Atlas, [T₂]. (Hygrophoraceae)
- **Hygrophorus russula* (Schaeff.) Kauffman, (1918); under Cedars, *Q. ilex* of Middle Atlas and under *Q. suber* near Tanger, [T₂]. (Hygrophoraceae)
- **Inocybe corydalina* Quéél., (1875); under *Q. suber* of the Mamora & *Q. ilex* of Middle Atlas, [T₁]. (Inocybaceae)
- **Inocybe griseovelata* Kühner, (1955); in the woods of mixed *Quercus* of Tangier, under *Pinus halepensis* in the Rif, [T₁]. (Inocybaceae)
- **Inocybe margaritispora* (Berk.) Sacc., (1887); under the *Q. suber*, arrounds Tanger and Larache, [T₁]. (Inocybaceae)
- **Inocybe mixtilis* (Britzelm.) Sacc. (1887); near Tanger, [T₁]. (Inocybaceae)
- **Inocybe pudica* Kühner, (1947), (= *Inocybe whitei* (Berk. & Broome) Sacc., 1887); among the dead leaves of *Q. pyrenaica* stand of the Rif, [T₁]. (Inocybaceae)
- **Inocybe queletii* Konrad, (1929); under the Cedars of Middle Atlas, [T₁]. (Inocybaceae)
- **Inocybe roseipes* Malençon, (1970); under the Cedars of Middle Atlas, [T₁]. (Inocybaceae)
- **Lactarius controversus* Pers., (1800); wet ravines, under *Q. faginea*, near Tanger, [fasc. 3, t. 94]. (Russulaceae)
- **Lactarius glutinopallens* F.H. Møller & J.E. Lange, (1940), (= *Lactarius albocarneus* Britzelm., 1895); under *Q. ilex* in the Tazekka, under *Q. Suber* near Tanger, [fasc. 3, t. 94]. (Russulaceae)
- **Lactarius volemus* (Fr.) Fr., (1838); under *Pinus pinea* and *Q. suber* near Tanger, [fasc. 3, t. 94]. (Russulaceae)
- **Lepiota helveola* Barla, (1888), Bres., (1881), sensu Reid [TBMS 84: 719 (1985)], (= *Lepiota brunneolilacea* Bon & Boiffard, 1972), sensu Rea (1922), (= *Lepiota brunneoincarnata* Chodat & C. Martín, 1889); clearings of oak's forest or cedar forest around of Rabat, Tanger, [T₁]. (Agaricaceae)
- **Lepiota lilacea* Bres., (1892); in the grass glades of the forest of Azrou, [T₁]. (Agaricaceae)
- **Lepista irina* (Fr.) H.E. Bigelow, (1959); clearings and pastures near Tanger, [T₂]. (Tricholomataceae)
- **Leptoglossum muscigenum* (Bull.) P. Karst., (1879), (= *Arrhenia spathulata* (Fr.) Redhead, 1984); on living mosses in the Middle Atlas and Rif, [T₂]. (Tricholomataceae)
- **Leucopaxillus albissimus* var. *paradoxus* (Costantin & L.M. Dufour) Singer & A.H. Sm., (1943), (= *Leucopaxillus paradoxus* (Costantin & L.M. Dufour) Boursier, 1925); in the *Quercetum ilicis* of Middle Atlas, [T₂]. (Tricholomataceae)
- **Leucopaxillus lepidoides* (Maire) Singer, (1939; pastures of the Middle Atlas, [T₂]. (Tricholomataceae)
- **Leucocoprinus brumalis* f. *crassior* Bourdot and Galz; on dead wood buried in Wadi Korifla, on *Q. suber* in the Mamora, [Maire & Werner]. (Tricholomataceae)
- **Lyophyllum ozes* (Fr.) Singer, (1943); in cedar forests of the Middle Atlas central, [T₂]. (Tricholomataceae)
- **Macrocyttidia cucumis* f. *minor* Joss., (1933), (= *Macrocyttidia cucumis* (Pers.) Joss., 1934); under *Abies pinsapo* and Cedars in the Rif, lawns and *Q. ilex* of Middle Atlas, [T₂]. (Marasmiaceae)
- **Marasmius dryophilus* var. *funicularis* Fr. Rea, (1922), (= *Gymnopus ocior* (Pers.) Antonín & Noordel., 1997); under *Q. suber* of Mamora, [T₂]. (Marasmiaceae)
- **Marasmius impudicus* Fr., (1838), (= *Gymnopus impudicus* (Fr.) Antonín, Halling & Noordel., 1997); under *Q. suber*, on *Eucalyptus*' strains and under *Pinus* in coastal Meseta, central plateau, Rif, [T₂]. (Marasmiaceae).

- **Marasmius prasioemus* (Fr.) Fr., (1838), sensu auct., (= *Mycetinis querceus* (Britzelm.) Antonín & Noordel., 2008); among dead leaves of *Q. ilex* in the Rif and Middle Atlas, [T₂]. (Marasmiaceae)
- **Mycena atromarginata* (Lasch) P. Kumm., (1871); in troops near a dead cedar, under *Q. pyrenaica* in the Rif, [T₂]. (Mycenaceae)
- **Mycena fibula* (Bull.) Kühner, (1938), (= *Rickenella fibula* (Bull.) Raitelh., 1973); under the *Quercus* in Tanger and around Larache, [T₂]. (Mycenaceae)
- **Mycena filopes* (Bull.) P. Kumm., (1871), sensu auct., (= *Mycena vitilis* (Fr.) Quél., 1872); under *Q. pyrenaica* in the Rif, [T₂]. (Mycenaceae)
- **Mycena polygramma* (Bull.) Gray, (1821); on twigs of *Q. suber* of Mamora, [Maire & Werner]. (Mycenaceae)
- **Mycena pseudocorticola* Kühner, (1938); on *Q. suber* in Larache, on *Olea europaea* in the High Atlas, [T₂]. (Mycenaceae)
- **Mycena rubromarginata* (Fr.) P. Kumm., (1871), (= *Mycena rubromarginata* (Fr.) P. Kumm., 1871), sensu auct. brit. p.p., (= *Mycena capillaripes* Peck, 1888); on debris of *Olea europea* and fallen branches unidentified in Tanger, [T₂]. (Mycenaceae)
- **Omphalia chlorocyanea* (Pat.) Sacc., (1887), (= *Arrhenia chlorocyanea* (Pat.) Redhead, Lutzoni, Moncalvo & Vilgalys, 2002); in the forest of Mamora, [Maire & Werner]. (Tricholomataceae)
- **Omphalina ericetorum* (Pers.) M. Lange, (1955), (= *Lichenomphalia umbellifera* (L.) Redhead, Lutzoni, Moncalvo & Vilgalys, 2002); on wetland shaded in Tanger, [T₂]. (Tricholomataceae)
- **Omphalina obscurata* D.A. Reid, (1958), Kühner ex M. Lange, (1955), (= *Arrhenia obscurata* (D.A. Reid) Redhead, Lutzoni, Moncalvo & Vilgalys, 2002); on wetland shaded in Tanger, [T₂]. (Tricholomataceae)
- **Omphalina rosella* (M.M. Moser) M.M. Moser ex Redhead, Ammirati & Norvell, (1996), (= *Contumyces rosellus* (M.M. Moser) Redhead, Moncalvo, Vilgalys & Lutzoni, 2002); wastelands and shaved lawns of the Middle Atlas and Rif, [T₂]. (Tricholomataceae)
- **Omphalina smaragdina* (Berk.) Malençon & Bertault, (1975); in the clearings of Mamora, [T₂]. (Tricholomataceae)
- **Oudemansiella badia* (Lucand) M.M. Moser, (1955), (= *Xerula pudens* (Pers.) Singer, 1951); rare on the coast: near Tanger under *Arbutus unedo* and *Q. coccifera* and Unusual throughout the Middle Atlas under *Cedrus* and *Q. ilex*. Contrary frequent in the Rif under *Abies pinsapo*, [T₂]. (Physalacriaceae)
- **Panaeolus sphinctrinus* (Fr.) Quél., (1872), (= *Panaeolus papilionaceus* (Bull.) Quél., 1872); smoked places near Tanger, [T₁]. (Strophariaceae)
- **Paxillus filamentosus* (Scop.) Fr., (1838), sensu auct., (= *Paxillus rubicundulus* P.D. Orton, 1969); *Eucalyptus* of Tanger, Mamora, Ferjana, [fasc. 3; t. 95]. (Paxillaceae)
- **Pleurotus mutilus* (Fr.) Gillet, (1876), (= *Omphalina mutila* (Fr.) P.D. Orton, 1960), sensu Lange [Fl. Ag. Dan. 2: 71 & pl. 79C (1936)], auct. brit., (= *Clitopilus scyphoides* (Fr.) Singer, 1946); grouped among the moss, sélaginelles and some Sphagnum in northern Morocco, [T₂]. (Pleurotaceae)
- **Pluteus leoninus* (Schaeff.) P. Kumm., (1871), sensu Rea (1922), Cooke, (= *Pluteus aurantiorugosus* (Trog) Sacc., 1896); on *Q. faginea* in the forest of Azrou, [T₁]. (Pluteaceae)
- **Pluteus marginatus* (Quél.) Bres., (1929), (= *Pluteus luctuosus* Boud., 1905); in *Chamaerops humilis* wastelands near Tanger, [T₁]. (Pluteaceae)
- **Pluteus minutissimus f. typicus*; on Oliviers, in Ziatene near Tanger, [T₁]. (Pluteaceae)
- **Pluteus semibulbosus* (Lasch) Quél., (1875), sensu NCL (1960), Brit. Fung. Fl. 4: 85 (1986), (= *Pluteus inquilinus* Romagn., 1979); on rotten wood near Tanger, on *Q. suber* in forest of Mamora, on *Q. ilex* in the Middle Atlas, [T₁]. (Pluteaceae)
- **Polyporus giganteus* Harz, (Pers.) Fr., (1815), (= *Meripilus giganteus* (Pers.) P. Karst., 1882); on *Q. suber* in Mamora, on *Q. ilex* in Middle Atlas, [Maire & Werner]. (Polyporaceae)
- **Psalliota ingrata* F.H. Møller, (1950), (= *Agaricus bernardii* Quél., 1878); under *Acacia* and *Pinus* in Tanger and in wasteland of Rabat, [T₁]. (Agaricaceae).

- **Pseudoclitocybe obbata* (Fr.) Singer, (1962); under the oaks of Middle Atlas, [T₂]. (Tricholomataceae)
- **Pulveroboletus cramesinus* (Secr. ex Watling) M.M. Moser ex Singer, (1966), (= *Aureoboletus gentilis* (Quél.) Pouzar, 1957); under *Q. suber* in Larache and in the Rif, [fasc. 3. t. 95]. (Boletaceae)
- **Resupinatus cyphelliformis* (Berk.) Singer, (1951), (= *Hohenbuehelia cyphelliformis* (Berk.) O.K. Mill, 1986); on a dead stem of *Thapsia garganica* in Rabat, [T₂]. (Pleurotaceae)
- **Rhodophyllus byssisedus* (Pers.) Quél, (1886), (= *Entoloma byssisedum* (Pers.) Donk, 1949); on rotting stumps of *Salix* sp. in Tanger & Rif, [T₁]. (Entolomataceae)
- **Russula amoena* Quél. (1881), sensu A.A. Pearson [Naturalist (1948)], (= *Russula violeipes* Quél, 1898); under *Pinus pinea* and *Q. suber* near Tanger, [fasc. 1. t. 94]. (Russulaceae)
- **Russula basifurcata* Peck., (1885); under *Acacia* in Tanger, under the Cedars in the Rif, [fasc. 1. t. 94]. (Russulaceae)
- **Russula galochroa* (Fr.) Fr., (1874), (= *Russula heterophylla* (Fr.) Fr., 1838), sensu Cooke [Ill. Brit. Fung. 1011 (1089) Vol. 7 (1888)], (= *Russula pseudoaeruginea* (Romagn.) Kuyper & Vuure, 1985); under *Acacia*, *Cistus* & *Q. coccifera* near Tanger, [fasc. 1. t. 94]. (Russulaceae)
- **Russula laurocerasi* Melzer, (1920), (= *Russula grata* Britzelm, 1898); under *Pinus* near Tanger, [fasc. 1. t. 94]. (Russulaceae)
- **Russula luteotacta* Rea, (1922); under the *Quercus* near Tanger, [fasc. 1. t. 94]. (Russulaceae)
- **Suillus bovinus* (L.) Roussel, (1796); under *Pinus canariensis* and *P. halepensis* in coastal Meseta, [fasc. 1. t. 94]. (Suillaceae)
- **Terfezia claveryi* Chatin, (1892); on the roots of *Helianthemum* sp., mounts of Figuig, [Maire & Werner]. (Pezizaceae)
- **Tricholoma acerbum* (Bull.) Quél., (1872); wooded bush in *Q. ilex* and *Q. suber* and woodlands of the plains and mountains in Tanger, [T₂]. (Tricholomataceae)
- **Tricholoma album* (Schaeff.) P. Kumm., (1871), sensu NCL (1960) p.p., J.E. Lange, (= *Tricholoma stiparophyllum* (N. Lund) P. Karst., 1879); under *Q. suber* in Tanger, under *Acacia cyanophylla* of the Rif, [T₂]. (Tricholomataceae)
- **Tricholoma rutilans* (Schaeff.) P. Kumm., (1871), sensu Masee, (= *Gymnopilus crociphylus* (Sacc.) Pegler, 1965); always on conifers, bounded to the north of Morocco, on strains of *Pinus* in Tanger, on *Abies pinsapo*, [T₂]. (Tricholomataceae)
- **Tricholoma ustale* (Fr.) P. Kumm., (1871); to date only encountered in the Rif, under *Q. pyrenaica* and *Q. suber*. But common in Japan, [T₂]. (Tricholomataceae)
- **Volvaria murinella* var. *umbonata* J.E. Lange, (1940), (= *Volvariella taylorii* (Berk. & Broome) Singer, 1951); on old strain of *Q. Suber*, & under *Eucalyptus* in Mamora, [T₁]. (Pluteaceae)
- **Xerocomus badius* (Fr.) E.-J. Gilbert, (1931), (= *Boletus badius* (Fr.) Fr., 1832); *Pinus halepensis*, Tanger, [fasc. 3. t. 95]. (Boletaceae)

The fairly rare species

- **Amanita caesarea* (Scop.) Pers., (1801); in the Rif under *Q. suber*, *Q. pyrenaica*, but frequent elsewhere, [T₁]. (Amanitaceae)
- **Amanita codinae* (Maire) Bertault, (1955). Cherf-el-Akab, [T₁]. (Amanitaceae)
- **Clitocybe inornata* (Sowerby) Gillet, (1874); under *Abies pinsapo* in the Rif, under *Pinus pinaster* in Middle Atlas, *Cedrus* and *Q. ilex*, [T₂]. (Tricholomataceae)
- **Clitopilus popinalis* var. *typicus* (Fr.) P. Kumm., (1871); under *Q. ilex* and *Cedrus* in the Middle Atlas, under *Pinus* in Larache & near Tanger, [T₂]. (Entolomataceae)
- **Cortinarius bulliardii* (Pers.) Fr., (1838); under *Q. suber* in the Mamora, Larache and Tanger, under *Q. ilex* in Middle Atlas, [T₁]. (Cortinariaceae).

- **Drosophila melanthina* (Fr.) Kühner & Romagn., (1953), (= *Psathyrella melanthina* (Fr.) Kits van Wav., 1985); on dead and decomposed trunks of *Opuntia Ficus-indica*, Tanger, [T₁]. (Psathyrellaceae)
- **Hygrophorus conicus* var. *chloroides* Malençon, (1975), (= *Hygrocybe conica* (Schaeff.) P. Kumm., 1871); in clear cedar forests mixed with *Q. ilex* in the Middle Atlas, under the oak trees in the forest of Ben Slimane, [T₂]. (Hygrophoraceae)
- **Hygrophorus marzuolus* (Fr.) Bres., (1893); Cedars of the Rif, [T₂]. (Hygrophoraceae)
- **Inocybe cervicolor* (Pers.) Quéf., (1886); in the forest of Azrou (Middle Atlas), [T₁]. (Inocybaceae)
- **Inocybe sambucina* (Fr.) Quéf., (1872); under the Cedras of Middle Atlas, [T₁]. (Inocybaceae)
- **Lepiota acutesquamosa* var. *furcata* Kühner (1936); under *Q. suber*, Middle Atlas and High Atlas, [T₁]. (Agaricaceae)
- **Lepiota setulosa* J.E. Lange, (1935), (= *Lepiota echinella* Quéf. & G.E. Bernard, 1888); in a grove of pine Aleps mixed with bushes *Q. ilex* and *Lentisques*. Tanger, Rif, [T₁]. (Agaricaceae)
- **Marasmius bresadolae* Schulzer, (1885), Kühner & Romagn., (1953), (= *Gymnopus erythropus* (Pers.) Antonín, Halling & Noordel., 1997); on strains of *Cytisus battandieri* and *Q. ilex* in the Middle Atlas, *Q. pyrenaica* in the Rif, [T₂]. (Marasmiaceae)
- **Marasmius littoralis* var. *microsporus*; on roots of grasses, twigs and downed woody debris in coastal plateau and mountains, Tanger, Rif, Middle and High Atlas, [T₂]. (Marasmiaceae)
- **Mycena maculata* P. Karst., (1890), Cleland, (1934), (= *Mycena austromaculata* Grgur. & T.W. May, 1997); on *Q. pyrenaica* and on Cedars of Rif, on *Q. lusitanica* of the Middle Atlas, [T₂]. (Mycenaceae)
- **Mycena seynesella* Malençon, (1975); on stumps or slaughtered trunks of conifers: *Abies pinsapo*, *Cedrus libanotica*, largely replied but fairly rare in the Middle Atlas, more frequent in the Rif, [T₂]. (Mycenaceae)
- **Pluteus cinereofuscus* J.E. Lange, (1917); on dead twigs of *Fraxinus angustifolia*, or at land among the twigs and dead leaves, Middle Atlas, [T₁]. (Pluteaceae)
- **Pseudoclitocybe cyathiformis* (Bull.) Singer, (1956); under *Abies pinsapo*, *cedrus* and *Pinus pinaster* in the Rif, under *Quercus* on Middle Atlas, [T₂]. (Tricholomataceae)

The infrequent species

- **Amanita excelsa* Gonn. & Rabenh., (Fr.) Bertill., (1866), sensu Stevenson, (= *Amanita karea* G.S. Ridl., 1991), (= *Amanita nothofagi* G. Stev., 1962), (= *Amanita australis* G. Stev., 1962); under *Eucalyptus* and *Quercus* near Tanger, [T₁]. (Amanitaceae)
- **Chaetocalathus craterellus* (Durieu & Lév.) Singer, (1943); from Tanger to Rabat, on dead twigs and dead fallen branches or suspended, [T₂]. (Marasmiaceae)
- **Clitocybe phyllophila* (Pers.) P. Kumm., (1871); in oak forests of the plain and mountains (Tanger, Middle Atlas), [T₂]. (Tricholomataceae)
- **Conocybe lactea* (J.E. Lange) Métrod, (1940), (= *Conocybe apala* (Fr.) Arnolds, 2003); lawns, grassy pastures: Tanger, Mamora, Rabat, [T₁]. (Bolbitiaceae)
- **Conocybe pilosella* (Pers.) Kühner, (1935), sensu Rea (1922), (= *Conocybe pubescens* (Gillet) Kühner, 1935); cool places, wet slope of *Quercetum ilicis* of Azrou, [T₁]. (Bolbitiaceae)
- **Conocybe teneroides* (J.E. Lange) Kühner, (1935), (= *Conocybe blattaria* (Fr.) Kühner, 1935), sensu auct., (= *Conocybe percincta* P.D. Orton, 1960); in the moss of wet slope of *Quercetum ilicis*, Azrou, [T₁]. (Bolbitiaceae)
- **Coprinus picaceus* (Bull.) Gray, (1821), (= *Coprinopsis picacea* (Bull.) Redhead, Vilgalys & Moncalvo, 2001); in mixed woods near Tanger, under *Q. suber* near Larache, under *Q. ilex* in the Middle Atlas and High Atlas, under *Pinus halepensis* in the Rif, [T₁]. (Psathyrellaceae)
- **Coprinus micaceus* (Bull.) Fr., (1838), sensu Lange, auct, (= *Coprinellus truncorum* (Scop.) Redhead, Vilgalys & Moncalvo, 2001); on wood of *Q. suber* near Tangier, on *Eucalyptus* sp. of the Central Plateau, on *Q. ilex* in the Middle Atlas and the High Atlas, [T₁]. (Psathyrellaceae)

- **Cortinarius aleuriusmus* Maire, (1910), sensu Ricken (1915) p.p., (= *Cortinarius rickenianus* Maire, 1937); under *Q. suber* in the Mamora, [T₁]. (Cortinariaceae)
- **Cortinarius cedretorum* Maire, (1914); under *Abies pinsapo* in the Rif, but frequent elsewhere, [T₁]. (Cortinariaceae)
- **Cortinarius purpurascens* Fr., (1838); under *Q. suber* in Mamora and Tanger, [T₁]. (Cortinariaceae)
- **Cortinarius variicolor* (Pers.) Fr., (1838); under *Pinus* in Tanger, under *Q. ilex* of Middle Atlas, [T₁]. (Cortinariaceae)
- **Cystoderma fallax* A.H. Sm. & Singer, (1945); in the Rif under *Pinus pinaster* and *Cedrus*; under *Cedrus* of Middle Atlas, [T₁]. (Agaricaceae)
- **Cystoderma granulosum* (Batsch) Fayod, (1889), (= *Cystodermella granulose* (Batsch) Harmaja, 2002); Rif on *Q. Pyrenaica*, Middle Atlas under *Q. ilex*, [T₁]. (Agaricaceae)
- **Delicatula ignobilis* (Joss.) Kühner & Romagn., (1953); on small places of clay court of Tanger and the Middle Atlas, [T₂]. (Tricholomataceae)
- **Delicatula mauretana* (Maire) Kühner & Romagn., (1953), (= *Hemimycena mauretana* (Maire) Singer, 1943); on phylloides of *Acacia* dead leaves of *Populus nigra* and *Quercus* in Tanger and the Rif, [T₂]. (Tricholomataceae)
- **Gomphus crassipes* (L.M. Dufour) Maire, (1937); in the Cedars of the Middle Atlas, [T₂]. (Gomphaceae)
- **Hebeloma sordidum* Maire, (1914); under the Cedras and the *Q. ilex* of Middle Atlas, [T₁]. (Cortinariaceae)
- **Hygrophorus carneogriseus* Malençon, (1971), (= *Cleistocybe carneogrisea* (Malençon) Vizzini, 2010); under the Cedars and the *Pinus pinaster* in the Middle Atlas, [T₂]. (Hygrophoraceae)
- **Hygrophorus pseudodiscoideus* (Maire) Malençon & Bertault, (1975); oak forests of the coastal plain and of the Central Plateau in the Rif, [T₂]. (Hygrophoraceae)
- **Inocybe asterospora* Quél., (1880); under *Q. suber* in Mamora, under *Quercus* sp in Tanger, under *Q. suber* of the Rif, under *Pinus pinaster* in the Middle Atlas, [T₁]. (Inocybaceae)
- **Inocybe maculata* Boud., (1885); under *Pinus* and *Quercus* in Tanger, under *Q. suber* of Larache, under *Q. pyrenaica* in the Rif and under *Q. lusitanica* in the Middle Atlas, [T₁]. (Inocybaceae)
- **Inocybe obscura* Gillet, (1876), sensu auct., (= *Inocybe cincinnata* (Fr.) Quél., 1872); under *Q. suber* in Mamora, in mixed woods in Tanger, under *Q. suber* of the Rif & under *Q. ilex* of Middle Atlas, [T₁]. (Inocybaceae)
- **Inocybe fastigiata* (Schaeff.) Quél., (1872), (= *Inocybe rimosa* (Bull.) P. Kumm., 1871); under *Quercus* and *Pinus* (Mamora, Middle Atlas and the High Atlas, [T₁]. (Inocybaceae)
- **Laccaria proxima* (Boud.) Pat., (1887); under the pines, in the coastal Meseta. Near Tanger under *Pinus pinea*, Larache under *Pinus* sp. And under *Pinus canariensis* (Lalla-Mimouna), [T₁]. (Hydnangiaceae)
- **Lepiota cristata* Barla, (Bolton) P. Kumm., (1871); Tanger, forest of the Mamora, under *Q. suber*, [T₁]. (Agaricaceae)
- **Lepista sordida* (Schumach.) Singer, (1951); pastures and clearer forests of the coastal Meseta from Rabat to Tanger, under *Q. ilex* of Middle Atlas and the High Atlas, [T₂]. (Tricholomataceae)
- **Lepiota melanotricha* Malençon & Bertault, (1970), (= *Leucoagaricus melanotrichus* (Malençon & Bertault) Trimbach, 1975); at land in the Rif, Middle Atlas and central Plateau, [T₁]. (Agaricaceae)
- **Lepiota subincarnata* J.E. Lange, (1940); Rabat, under *Pinus halepensis*, Larache under *Pinus pinea*, Tanger in grassy clearings, Rif under *Q. pyrenaica* and *Pinus halepensis*, Middle Atlas under *Q. faginae* and *Q. ilex*, central Plateau under *Q. suber*, [T₁]. (Agaricaceae)
- **Leucopaxillus albissimus* var. *barbarus* (Maire) Singer & A.H. Sm., (1943); in the *Quercetum-ilicis*, under the *Q. ilex* mixed with some cedar of Azrou (Middle Atlas), [T₂]. (Tricholomataceae)
- **Lyophyllum onychinum* (Fr.) Kühner & Romagn. (1953), (Fr.) Kühner&Romagn. ex Contu, (2009), (= *Rugosomyces onychinus* (Fr.) Raitelhel., 1979); under *Cedrus* and *Pinus pinaster* in the Rif and the Middle Atlas, [T₂]. (Lyophyllaceae).

**Melanoleuca grammopodia* (Bull.) Murrill, (1914); pastures, brush and clearings, Tanger, central Plateau and Middle Atlas, [T₂]. (Tricholomataceae).

**Mycena alba* (Bres.) Kühner, (1938); the tetrasporique form is not very frequent at the base of mossy trunks of *Olea europaea* near Tangier, [T₂]. (Mycenaceae)

**Mycena galopus* var. *nigra* Rea, (1922), (= *Mycena galopus* (Pers.) P. Kumm., 1971); on *Acacia dealbata*, *Pinus* and *Q. suber* in Tanger. on *Q. faginea* and *Q. pyrenaica* and on *Q. faginea* of Tazekka, on *Q. suber* of central Plateau, on *Eucalyptus gomphocephala* of Meseta coastal, [T₂]. (Mycenaceae)

**Mycena iodolens* S. Lundell, (1932), (= *Mycena filopes* (Bull.) P. Kumm., 1871); under *Cedrus*, *Pinus* and *Quercus* in Tanger, [T₂]. (Mycenaceae)

**Mycena polygramma* (Bull.) Gray, (1821); on *Q. suber* of Mamora, on *Quercus* sp. in Tanger, on *Q. pyrenaica* of the Rif, on *Pistacia lentiscus*, *Q. faginea* and *Q. ilex* of Middle Atlas, [T₂]. (Mycenaceae)

**Mycena zephirus* (Fr.) P. Kumm., (1871); at land, under almost pure oak in the Middle Atlas, [T₂]. (Mycenaceae)

**Panus conchatus* (Bull.) Fr., (1838); on *Q. suber* of Mamora, on *Quercus* sp. in Tanger, on *Alnus glucinosa*, [T₂]. (Polyporaceae)

**Pleurotus lignatilis* (Pers.) P. Kumm., (1871), (= *Ossicaulis lignatilis* (Pers.) Redhead & Ginns, 1985); on *Q. suber* of Mamora and in Tanger, observed on *Cedrus* of Middle Atlas, [T₂]. (Lyophyllaceae)

**Pluteus chrysophaeus* (Schaeff.) Quél., (1872), sensu auct., (= *Pluteus phlebophorus* (Ditmar) P. Kumm., 1871); under *Q. faginea* and *Q. Ilex* in the Middle Atlas, [T₁]. (Pluteaceae)

**Pseudoclitocybe expallens* (Pers.) M.M. Moser, (1967); wasteland, grassy gold-colored or clearer oak, mixed or not with cedars, mountain regions in the Middle Atlas and High Atlas, [T₂]. (Tricholomataceae)

**Russula aeruginea* Lindbl. ex Fr.,(1863), sensu Cooke [Ill. Brit. Fung. 1027 (1090) Vol. 7 (1888)], (= *Russula parazurea* Jul. Schäff., 1931); under *Pinus halepensis*: *P. Pinea* and *Q. Suber* inTanger and Larache, [fasc. 1, t. 94]. (Russulaceae)

**Russula alutacea* (Fr.) Fr., (1838); under *Pinus* and *Quercus*: Tanger, Mamora, Moyen Atlas, [fasc. 1, t. 94]. (Russulaceae)

**Xeromphalina fellea* Maire & Malençon, (1945), (= *Xeromphalina cauticalis* (With.) Kühner & Maire, 1934); at land, cedarwood or among the needles of *Pinus pinaster*, Middle Atlas and the Rif, [fasc. 1, t. 94]. (Mycenaceae)

RESULTS AND DISCUSSION

251 endemic and rare fungal species are recorded in different regions of Morocco; from the work of Maire & Werner [10], Malençon & Bertault [11-21], Malençon [18] and Bertault [3-5]. Through to this richness, 14 species are endemic, 3 endemic Mediterranean-Morocco, 57 very rare, 116 rare, 18 fairly rare and 44 not very frequents. Endemic and rare taxa are mainly found in the Middle Atlas, the Rif, Tangier and the coastal Meseta (Table 1). Some species of ecological and economic interests are threatened, the example of *Boletus mamorensis*. This species is endemic to the forest of Mamora and excellent edibility was the subject of a massive exploitation by local populations, due to its intensive marketing [26] leading to its disappearance. According to Bertault [2], despite the number of prospectations in the forest of Mamora during the favorable periods, it was unable find her.

Table. Endemism and rarity of the species in function of geographic aerie.

	Endemics	Very rare	Rares	fairly rare	Not very frequents
Middle Atlas	10	25	40	14	29
Coastal plateau	2	11	28	1	16
Tangier	7	24	55	5	26
Rif	1	18	43	8	16
Central plateau	-	-	1	1	6
High Atlas	1	2	8	2	5

The Boletes and the other deemed species (good edible) are all threatened. Their collection is often performed with uncontrolled and anarchic manner. The majority of endemic and rare forest mushrooms are mycorrhizal species (*Cortinarius* (23 species), *Mycena* (17 species), *Hygrophorus* (12 species), *Inocybe* (12 species), *Clitocybe* (6 species), *Amanita* (16 species) ...) related to specific forest species. Many of them depend exclusively on a single species of tree.

Therefore, the disappearance of these trees or their replacement by other woody species entails a modification to the fungal flora. The modifications of the mycoflora can be due to several reasons. The disappearance of biotopes, pollution, agricultural practices and industrial, the intensive collection of edible species even before they have could sporulate; and lack of knowledge of species, are the main threats. The state of the fungal flora depends on multiple factors whose some of which still remain to be discovered and it is difficult to evaluate the importance of links and Correlations between them. However, it is clear that the collection is the major factor in the regression of fungi hence the need to raise awareness among their amateurs to follow them. The decline in vitality of mushrooms has necessarily an influence on the vitality of the forest. The present inventory will constitute a basis for the realization of a national red List of fungi, which will help to the management of the fungal national heritage, above all regarding endangered species.

REFERENCES

- [1] Benabid A. 2000. Flore et écosystèmes du Maroc. Evaluation et préservation de la biodiversité. Ibis Press, 359 p.
- [2] Bertault R., 1978. Russules du Maroc, Bull. Soc. Myc. Fr., 94 : 5-31.
- [3] Bertault R., 1978. Lactaire du Maroc. Bull. Soc. Myc. Fr., 94: 273-288.
- [4] Bertault R., 1979. Bolets du Maroc. Bull. Soc. Myc. Fr., 95 (3)
- [5] Bertault R., 1980. Amanites de Maroc (3^{ème} contribution) Bull. Soc. Myc. Fr., 96 (3) : 271-287.
- [6] El-Assfoury A., Ouazzani Touhami A., Fennane M. & Douira A., 2003. Inventaire des spécimens fongiques de l'Herbier national de l'Institut Scientifique de Rabat. Bulletin de l'Institut Scientifique, Rabat, section Sciences de la vie, N 25 ; 1-23.
- [7] Fennane M., Radford E. & de Montmollin B., 2004. Rapport de l'atelier "zones importantes pour les plantes au Maroc ", Institut scientifique, Rabat, 35 p.
- [8] Houdou G., 2002. Guide des champignons: milieu par milieu. Ed. Belin. Paris. 287p.
- [9] Kirk P., 2005. Ainsworth and Bisby's Dictionary of the Fungi, 9th Edition, www.infexfungorum.org/
- [10] Maire R. & Werner G., 1937. Catalogue raisonné des champignons connus jusqu'ici au Maroc. Mém. Soc. Sc. Nat. Maroc, 45: 1-148.
- [11] Malençon G., 1935. Société des Sciences Naturelles du Maroc (comptes rendus des séances mensuelles N°4)
- [12] Malençon G., 1936. Société des Sciences Naturelles du Maroc (comptes rendus des séances mensuelles N°5)
- [13] Malençon G., 1938. Les truffes européennes. *Revue Mycologie*, 3. n. s. supplm : 1.
- [14] Malençon G., 1960. Excursion mycologique dans le Nord de la forêt de la Mamora, vers El Manzeh. Soc. Nat. et Phys. Maroc, (Comptes rendus des séances mensuelles-N°8) 146-147.
- [15] Malençon G. & Bertault R., 1967. Champignons des suberaies de la Meseta. Première liste. C. R. Soc. Nat. et Phys. Maroc, 47: 271-273.
- [16] Malençon G. & Bertault R., 1969. Champignons des suberaies de la Meseta. Deuxième liste C. R. Soc. Nat. et Phys. Maroc, 49-78.
- [17] Malençon G. & Bertault R., 1970. Champignons des suberaies de la Meseta. Troisième liste C. R. Soc. Nat. et Phys. Maroc, 50 : 57 p.
- [18] Malençon G., 1973. Champignons hypogés du Nord de l'Afrique, I- Ascomycètes. Persoonia, published by the Rijksherbarium, Leiden, volume 7, Part 2, pp. 261-288.
- [19] Malençon G. & Bertault R., 1970. Flore des champignons supérieurs du Maroc, Tome I. Faculté des sciences de Rabat, Maroc, 601 p.
- [20] Malençon G., 1974-1975. Champignons gypogés du Nord de l'Afrique, II- Basidiomycètes. *Revue de Mycologie*, Tome XXXIX, 306 p.
- [21] Malençon G. & Bertault R., 1975. Flore des champignons supérieurs du Maroc, Tome II. Trav. Inst. Sci. Chérifien et Fac. Sciences de Rabat, sér. Botanique n 33, 539 p.

- [22] Migliozi V. & Camboni M., 2000. *Amanita eliae* and *Amanita eliae* var. *griseoseovelata* Stat. Nov.: description of collections from Latium. Bollettini del Gruppo Micologies "G. Bresadola" (Nuova serie) 43 (2): 125-124.
- [23] Neville P. & Poumarat S, 1998. A propos de *Clitocybe amoenolens*. Bull. Féd. Mycol. Dauphiné-Savoie, 151: 5-8.
- [24] Ortegat A. & Estexe-RAxentòs F., 2005. Preliminary checklist of the basidiomycetes from mediterranean inland dune ecosystems in Seville (Spain). Mycotaxon 92: 437-440.
- [25] Outcoumit A, Yamni K., Ouazzani Touhami A., Badoc A. and Douira A., 2006. *Boletus mamorensis*, le Cèpe de la Mamotra (Maroc). Bull. Soc. Linn. Bordeaux 141, (N.S.) n°34, p. 169-174.
- [26] Redeuilh G., 1978. *Boletus mamorensis* Nov. Sp. Bull. Soc. Myc. Fr, t. 94, fasc. 3.