Preliminary checklist of the macromycetes from Collestrada forest ecosystems in Perugia (Italy)

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ABSTRACT — A preliminary taxonomic list of the macromycetes growing in forest ecosystems in Perugia (Italy) is presented based on mycological research carried out in the most widespread local plant communities from the forest of Collestrada: *Quercus* spp. woodlands, *Carpinus betulus* L. woodland and plantations with *Pinus pinea* e/o *Pinus pinaster*. In the period from Jan. 2011 to Dec. 2011 133 taxa belonging to 170 genera were recorded. For each taxa the following items were reported: Latin name, author, WGS-84 Global Position System (GPS) coordinates, coordinate grids from a Google Earth Collestrada image, date of the survey and habitat. This work contributes to the Umbrian regional checklist, which will eventually be integrated with the Italian national checklist.

KEY WORDS — mycological flora, hornbeam woodland, oak woodlands, Pine plantation, taxonomy

Fig. 1. Coordinate grids of Google Earth Collestrada forest image

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Introduction

The forest of Collestrada (PG) is situated in the region of Umbria (central Italy), covering an area of approximately 136 ha (250-306 m a.s.l.) (Fig. 1). Collestrada forest is located on the northern slope of a slight hill, (Colle del Monte), part of a chain of hills, located East–SouthEast of Perugia, and delimitated on the West by the River Tiber (Valle Tiberina) and on the East by the River Chiascio (Valle Umbra).

The climatic characteristics of the studied area are similar to those of the town of Perugia, as can be seen from the phytoclimatic analysis of the region of Umbria by Venanzoni et al. (1998). Based on the bioclimatic indices, the climate of Perugia can be defined as Temperate Macroclimate, Upper Hilly Thermotype, Lower Humid Umbrotype, with dry summers and maximum precipitation in spring and autumn (Rivas-Martìnez & Rivas-Saenz 2009). The lowest temperatures are recorded in Jan-Feb, frequently falling below 0°C. The highest temperatures occur in July and August, normally reaching a maximum of 30°C, and rarely going above 35°C.

The forest ecosystem has an exceptionally rich flora and fauna and has been declared a Site of Community Importance (S.C.I.) (Council Directive 1992/43/EEC, 1992) in 2008. The special interest in the macromycetes in the forest of Collestrada (Perugia, Italy) is due, in particular, to the biodiversity in the site of study (Ministero dell'ambiente e della tutela del territorio, 2011). Data regarding the distribution of macromycetes hasn't been published in the specialized literature. The main aim of this preliminary checklist is to provide a contribution to the mycological knowledge on the forest of Collestrada. It can be considered a small portion of a more complete work regarding the mycological flora of the region of Umbria, and is also aimed at integrating and updating the Italian checklist.

Materials & methods

The mycological studies were conducted in 2011 with the tracking method, mainly throughout the most widespread local plant communities (Lacheva 2009):

1) *Carpinus betulus* L. woodland (*Erythronio-Carpinion betuli)*. Oriented SW-NE, in the centre of Collestrada forest, in cool, shady environments with deep soil.

2) *Quercus cerris* L. woodland (*Lonicero xilostei-Quercetum cerridis*). Located towards the top of the slope, especially in the SouthWest, with mainly sandy soils.

3) *Quercus farnetto* Ten. woodland *(Malo florentinae-Quercetum farnetto)***.** Located at the bottom of the hill, in deep, sub-acid soils with high clay content (Biondi *et al*., 2002).

4) *Quercus petraea* (Matt.) Liebl. woodland *(Erythronio-Carpinion betuli*). Located in the area between the two main impluvia in environments which are cool and shady due to the N-NE exposure.

5) *Quercus ilex* L. woodland (*Rusco aculeati-Querceto ilicis*). Located on steep slopes, particularly those eposed to the South of the main canal crossing the study area in a SW-NE direction.

6) Plantations with *Pinus pinea* L. e/o *Pinus pinaster* Aiton. Located sporadically in the *Quercus* spp. woodlands.

Collections were carried out using a network of main and council forestry roads and tracks for primary access. From Jan. 2011 to Dec. 2011, all macrofungal carpophores were collected once a week (during autumn and spring) or once every two weeks (in winter and summer periods). Carpophore surveys were limited to macromycetes that were visible to the naked eye (greater than 1 mm in size) (Arnold, 1981). The locations in WGS-84 coordinates in decimal degrees of all collecting sites were recorded using a Global Position System (GPS) unit. All macromycetes were photographed and described (unless duplicates of already well known taxa). After drying in air-vented ovens at 30° C for 72 hr, representative voucher specimens were deposited at the herbarium of Sect. Biologia vegetale e Geobotanica of University of Perugia (Italy).

Each specimen was identified on the basis of macro and micromorphological characteristics, taking into account the following literature keys and monographs: Romagnesi (1967), Marchand (1971-1986), Alessio & Rebaudengo (1980), Moser (1980, 1983), Breitenbach & Kränzlin (1984-2000), Alessio (1985), Basso (1999), Bon (1984), Riva (1988, 2003), Noordeloos et al. (2001), Candusso (1997), Bas et al. (1990-2001), Courtecuisse (1999), Antonini & Antonini (2002), Versterholt (2002), Contu (2003), Ladurner & Simonini (2003), Courtecuisse & Duhem (2005), Bernicchia (2005), Sarnari (2005), Frøslev et al. (2006), Grupo Ibero-insular de Cortinariologos (2007), Boccardo et al. (2008). Names of fungi and author's abbreviations follow the Index Fungorum (http://www.indexfungorum.org/Names/Names.asp) and Dictionary of the Fungi (Kirk *et al*., 2008). Author name abbreviations for plants follow the standards established by the International Plant Names Index (IPNI 2008). The species indicated with the mark '◊' are those not yet listed as occurring in Umbria, those indicated with '□' do not occur on the Italian checklist at all (Onofri et al. 2005). All material is databased at DBA (Department of Applied Biology) on the 'anArchive' database (www.anarchive.it) and this data will eventually be accessible on the Collestrada Virtual Herbarium (CVH).

Result and Discussion

The mycoflora list has 133 species of macromycetes belonging to 70 genera included in the *Basidiomycota* (125 species) and *Ascomycota* (8 species) divisions. However the number of species on the list is actually rather low considering the area in question has an exceptional biodiversity.

This is probably due to the fact that the year 2011 was particularly dry, and this, together with the high temperatures in spring and summer, greatly decreased the production of fungal fruit bodies. It is well known that these climatic conditions always lead to lower carpophore productivity, in particular of symbionts. Ohenoja (1993) documented the effects of year-round temperatures on fall fruiting of macrofungi. She found that temperature interacted with the habitat and ecological guild of the fungi in stimulating or retarding fruiting.

The list below is ranked alphabetically for ease of use and does not fully reflect systematic relationships. For each taxon, the following items are given: the Latin name, the author, the WGS-84 Global Position System (GPS) coordinates in decimal degrees, coordinate grids of Google Earth Collestrada forest image (Fig. 1), the date of the survey during which the species was found (for the first time) and the habitat of the place where the fungi was collected. The checklist below contains only those taxa for which a reasonably confident identification has been obtained. Most of the 'polyporoid' taxa are excluded from these lists as they are currently under review; however, it is hoped that considerable numbers of species will shortly be determined.

The analysis of the fungi found in this area reveals the dominance of species associated with broad-leaved woods in general, or to conifers (the most frequently found are *Baeospora myosura, Craterellus lutescens*, *Entoloma sinuatum)*. The number of the fungal species recorded in acidophilic *Q. farnetto* woodland was greater than that recorded in all the other woodland types investigated, and certain species (*Amanita vaginata, Inocybe geophylla* var. *geophylla, Lactarius piperatus* and *Russula maculata)* showed a preference for this environment. Despite this, a notable number of species normally associated with oak woodlands were absent on our checklist due to the climatic characteristics of 2011, as mentioned before (Buee et al. 2011, O'Hanlon & Harrington 2012).

Mycena interrupta and *Tremella aurantia* are the only species new to the Italian check-list (Onofri et al. 2005). Macrosporic and microscopic characteristics of *M. interrupta* and *T. aurantia* correspond to those described by Robich (2003) and Roberts (1995), respectively.

Many of the species in the checklist (58) are probably first recordings for the Umbrian region (Onofri et al. 2005), but without preceding publications on an Umbrian macromycetes checklist, it is difficult to determine which species have already been noted as present in the area.

List of taxa

Ascomycota

Dasyscyphella *Hyaloscyphaceae, Leotiomycetes*

1. ***Dasyscyphella nivea*** (R. Hedw.) Raitv.
43°04'47.4"N 12°28'05.3E, L11, 18.03.2011. On decayed wood (twigs etc.) of *Q. farnetto*.

Hypoxylon *Xylariaceae, Sordariomycetes*

2. ***Hypoxylon fuscum*** (Pers.) Fr.
43°04'50.0"N 12°27'40.4"E, I6, 02.05.2011. On dead wood of *Corylus avellana*.

Leotia *Leotiaceae, Leotiomycetes*

3. ***Leotia lubrica*** (Scop.) Pers.
43°04'50.4"N 12°27'40.5"E, I6, 02.01.2011. On soil under *Pinus* spp.

Nemania *Xylariaceae, Sordariomycetes*

4. ***Nemania serpens*** (Pers.) Gray
43°04'50.0"N 12°27'40.1"E, I6, 18.03.2011. On dead wood of *Q. cerris*.

Sarcoscypha *Sarcoscyphacea, Pezizomycetes*

5. ***Sarcoscypha coccinea*** (Jacq.) Boud.
43°04'56.4"N 12°27'40.6"E, G6, 26.01.2011. On buried or fallen hardwood sticks and branches, especially *Q. cerris*.

Sarcosphaera *Pezizaceae, Pezizomycetes*

6. ***Sarcosphaera crassa*** (Santi) Pouzar
43°04'50.2"N 12°27'39.5"E, I6, 04.04.2011. On soil under *Q. cerris*.

Tuber *Tuberaceae, Pezizomycetes*

7. ***Tuber aestivum*** *Vittad.*
43°04'54.5"N 12°27'49"E, G8, 23.06.2011. Underground beneath *Quercus* spp.

Xylaria *Xylariaceae, Sordariomycetes*

8. ***Xylaria hypoxylon*** (L.) Grev,
43°04'50.8"N 12°28'01.27"E, I11, 27.12.2011. On rotting wood of *Q. farnetto*.

Basidiomycota

Amanita *Amanitaceae, Agaricomycetes*

9. ***Amanita caesarea*** (Scop.) Pers.
43°04'50.0"N 12°27'42.8"E, I6, 09.09.2011. On soil associated with *Q. cerris*.

10. ***Amanita citrina*** (Schaeff.) Pers.
43°05'2.25" N 12°27'36.9"E, E5, 14.11.2011. On soil associated with *Q. cerris*.

11. ***Amanita franchetii*** (Boud.) Fayod
43°04'51.5"N 12°27'40.2"E, H6, 10.08.2011. On soil associated with *Q. ilex*.
12. ◊ ***Amanita mairei*** Foley
43°04'53.6"N 12°27'49.4"E, H8, 20.06.2011. On soil associated with *Q. farnetto*.
13. ***Amanita ovoidea*** (Bull.) Link
43°04'59"N 12°27'38.9"E, F6, 27.11.2011. On soil associated with *Q. farnetto*.
14. ***Amanita pantherina*** (DC.) Krombh.
43°04'49.8"N 12°27'43.1"E, I7, 05.12.2011. On soil associated with *Q. petraea*.
15. ***Amanita phalloides*** (Vaill. ex Fr.) Link
43°04'49.7"N 12°27'43.5"E, I7, 03.10.2011. On soil associated with *Q. petraea*.
16. ◊ ***Amanita rubescens*** Pers.
43°04'44.7"N 12°28'11.3"E, M13, 5.12.2011. On soil associated with *Q. farnetto*.
17. ***Amanita vaginata*** (Bull.) Lam.
43° 04' 59"N 12°27'39.1"E, F6, 20.06.2011. On soil associated with *Q. ilex*.

Armillaria *Physalacriaceae, Agaricomycetes*
18. ◊ ***Armillaria gallica*** Marxm. & Romagn.
43°04'58.6"N 12°27'39.6"E, F6, 14.11.2011. On woody debris of *Q. ilex* and shrubs.
19. ***Armillaria mellea*** (Vahl) P. Kumm.
43°04'47.4"N 12°28'05.1"E, L11, 10.11.2011. On living or dead trees of *Q. farnetto* and shrubs.
20. ***Armillaria tabescens*** (Scop.) Emel
43°04'46.8"N 12°28'06.05"E, L12, 10.08.2011. On wood of *Q. farnetto*.

Auricularia *Auriculariaceae, Agaricomycetes*
21. ***Auricularia auricula-judae*** (Bull.) Wettst.
43°04'54.3"N 12°27'54.9"E, G9, 18.03.2011. On wood of *Q. farnetto* and shrubs.
22. ◊ ***Auricularia mesenterica*** (Dicks.) Pers.
43°04'46.2"N 12°27'46.7"E, L7, 07.02.2011. On dead and decayed wood of *Q. petraea* and shrubs.

Baeospora *Marasmiaceae Agaricomycetes*
23. ◊ ***Baeospora myosura*** (Fr.) Singer
43°04'50.4" N 12°27'40.3"E, I6, 6.12.2011. On cones of *Pinus pinaster*.

Boletus *Boletaceae, Agaricomycetes*
24. ***Boletus aereus*** Bull.
43°04'51.4"N 12°27'57.2"E, H10, 03.10.2011. On soil in *Q. farnetto* woodland.
25. ***Boletus aestivalis*** (Paulet) Fr.
43°04'54.8"N 12°27'45.0"E, G7, 03.10.2011. On soil associated with *Q. ilex*.
26. ***Boletus luridus*** Schaeff.
43°04'55.2"N 12°27'44.8"E, G7, 10.08.2011. On soil in *Q. ilex* woodland.
27. ***Boletus rhodopurpureus*** Smotl.
43°04'52.3" N 12°27'55.8"E, H9, 10.08.2011. On soil associated with *Q. farnetto*.

Calocybe *Lyophyllaceae, Agaricomycetes*
28. ***Calocybe gambosa*** (Fr.) Donk
43°04'51"N 12°27'44"E, H7, 02.05.2011. On soil associated with *Q. petraea* and shrubs.

Cantharellus *Cantharellaceae, Agaricomycetes*
29. ***Cantharellus cibarius*** Fr.
43°05'20.7"N 12°27'37.3"E, G5, 13.01.2011. On soil amongst leaf litter in *Q. cerris* woodland.
30. ◊ ***Cantharellus ferruginascens*** P.D. Orton
43°04'50.4"N 12°27'43.00"E, I6, 3.10.2011. On soil associated with *Q. cerris*.

Ceriporiopsis *Polyporaceae, Agaricomycetes*
31. ◊ ***Ceriporiopsis mucida*** (Pers.) Gilb. & Ryvarden
43°04'52.2"N 12°27'50.2"E, H8, 07.02.2011. On rotten wood of *Q. farnetto*.

Clitocybe *Tricholomataceae, Agaricomycetes*
32. ***Clitocybe nebularis*** (Batsch) P. Kumm.
43°04'50.9"N 12°28'01.78"E, I11, 10.11.2011. On soil in *Q. farnetto* woodland.
33. ***Clitocybe odora*** (Bull.) P. Kumm.
43°04'49.2"N 12°27'41.6"E, I6, 14.11.2011. On soil in *Q. cerris* woodland.
34. ◊ ***Clitocybe metachroa*** (Fr.) P. Kumm.
43°04'50.4"N 12°27'40.4"E, I6, 6.12.2011. Amongst needle litter of *P. pinaster*.

Clitopilus *Entolomataceae, Agaricomycetes*
35. ***Clitopilus prunulus*** (Scop.) P. Kumm.
43°04'50.5"N 12°27'44.6"E, I7, 10.11.2011. On soil in *Q. petraea* woodland.

Conocybe *Bolbitaceae, Agaricomycetes*
36. ◊ ***Conocybe pulchella*** (Velen.) Hauskn. & Svrček.
43°04'55.4"N 12°27'42.7"E, G6, 05.12.2011. On soil in *Q. ilex* woodland.

Coprinopsis *Psathyrellaceae, Agaricomycetes*
37. ***Coprinopsis picacea*** (Bull.) Redhead, Vilgalys & Moncalvo
43°04'58.5"N 12°27'40.6"E, F6, 27.11.2011. On soil associated with *Q. ilex*.

Coriolopsis *Polyporaceae, Agaricomycetes*
38. ◊ ***Coriolopsis gallica*** (Fr.) Ryvarden
43°04'58.6"N 12°27'38.5"E, H7, 26.01.2011. On dead or living *Q. petraea* wood.

Cortinarius *Cortinariaceae, Agaricomycetes*
39. ◊ ***Cortinarius parasuaveolens*** (Bon & Trescol) Bidaud, Moënne-Locc. & Reumaux
43°04'56.5"N 12°27'42.4"E, I6, 14.11.2011. On soil associated with *Q. cerris*.
40. ***Cortinarius trivialis*** J.E. Lange
43°4'56.1"N 12°27'42.1"E, I6, 05.12.2011. On soil with *Pinus* spp. plantations.

Craterellus *Cantharellaceae, Agaricomycetes*
41. ***Craterellus cornucopioides*** (L.) Pers.
43°04'50.3"N 12°27'41.7"E, I6, 02.01.2011. On soil with *Pinus* spp. plantations.
42. ***Craterellus lutescens*** (Fr.) Fr.
43°04'50.5"N 12°27'41.7"E, I6, 02.01.2011. On soil with *Pinus* spp. plantations.

Crepidotus *Inocybaceae, Agaricomycetes*
43. ◊ ***Crepidotus epibryus*** (Fr.) Quél.

43°04'51.2"N 12°28'5.89"E, H12, 27.11.2011. On fallen wood (twigs etc.) of *Q. farnetto*.

Crucibulim *Agaricaceae, Agaricomycetes*
44. ◊ ***Crucibulum laeve*** (Huds.) Kambly
43°04'51.8"N 12°28'0.714"E, H11, 27.11.2011. On decayed woody debris in *Q. farnetto* woodland.

Cyathus *Agaricaceae, Agaricomycetes*
45. ◊ ***Cyathus striatus*** (Huds.) Willd.
43°04'43"N 12°27'54.1"E, M9, 07.02.2011. On fallen woody debris (sticks, twigs etc.) in *Q. farnetto* woodland.

Dacrymyces *Dacrymycetaceae, Dacrymycetes*
46. ◊ ***Dacrymyces chrysospermus*** Berk. & M.A. Curtis
43°04'54.6"N 12°27'41.2"E, G6, 07.02.2011. On dead *Q. ilex* wood.

Daedaleopsis *Polyporaceae, Agaricomycetes*
47. ◊ ***Daedaleopsis confragosa*** (Bolton) J. Schröt.
43°04'58.4"N 12°27'39.4"E, F6, 07.02.2011. On wood of *Q. ilex*.

Entoloma *Entolomataceae, Agaricomycetes*
48. ◊ ***Entoloma sericeoides*** (J.E. Lange) Noordel.
43°04'48"N 12°28'11.3"E, L13, 14.11.2011. On soil in *Q. farnetto* woodland.

49. ***Entoloma sinuatum*** (Bull.) P. Kumm.
43°04'44.6"N 12°28'11.1"E, M13, 05.12.2011. On soil associated with *Q. farnetto* and *Pinus sp*.

Fomes *Polyporaceae, Agaricomycetes*
50. ◊ ***Fomes fomentarius*** (L.) J.J. Kickx
43°04'45.6"N 12°27'44.7"E, L7, 07.02.2011. On wood of *Q. petraea*.

Galerina *Strophariaceae, Agaricomycetes*
51. ◊ ***Galerina marginata*** (Batsch) Kühner
43°04'50.2"N 12°27'45.1"E, I7, 14.11.2011. On decayed wood of *Pinus* spp.

Ganoderma *Ganodermataceae, Agaricomycetes*
52. ◊ ***Ganoderma lipsiense*** (Batsch.) G.F.Atk.
43°04'53.9"N 12°27'44.9"E, H7, 07.02.2011. On fallen trunks of *Q. petraea*.

Gymnopus *Marasmiaceae, Agaricomycetes*
53. ***Gymnopus dryophilus*** (Bull.) Murrill
43°04'53.8"N 12°27'45.4"E, H7, 10.11.2011. On humus and leaf litter in *Q. petraea* woodland.
54. ◊ ***Gymnopus foetidus*** (Sowerby) J.L. Mata & R.H. Petersen
43°04'51.4"N 12°27'42.8"E, H6, 10.11.2011. On decayed woody debris in *Q. cerris* woodland.
55. ***Gymnopus fusipes*** (Bull.) Gray
43°04'47.1"N 12°28'5.35"E, L12, 10.08.2011. On roots of living trees of *Q. farnetto*.

Hapalopilus *Polyporaceae, Agaricomycetes*
56. ◊ ***Hapalopilus nidulans*** (Fr.) P. Karst.
43°04'52.1"N 12°27'49.9"E, H8, 26.01.2011. On dead and decayed wood of *Q. farnetto*.

Hebeloma *Strophariaceae, Agaricomycetes*
57. ***Hebeloma crustuliniforme*** (Bull.) Quél.
43°04'55.7"N 12°27'42.3"E, G6, 27.11.2011. On soil associated with *Q. cerris*.
58. ◊ ***Hebeloma leucosarx*** P.D. Orton
43°04'48.7"N 12°28'9.74"E, I13, 27.11.2011. On soil associated with *Q. farnetto*.
59. ◊ ***Hebeloma sacchariolens*** Quél.
43°04'54.3"N 12°27'58.7"E, G10, 05.12.2011. On soil associated with *Q. farnetto*.

Hexagonia *Polyporaceae Agaricomycetes*
60. ◊ ***Hexagonia nitida*** Durieu & Mont.
43°04'52.2" N 12°27'50.4"E, H8, 6.12.2011. On wood of *Q. farnetto*.

Hydnum *Hydnaceae, Agaricomycetes*
61. ***Hydnum repandum*** L.
43°04'50.3"N 12°27'40.7"E, I6, 02.01.2011. On soil with *Pinus* spp.
62. ***Hydnum rufescens*** Schaeff.
43°04'51.2"N 12°27'39.8"E, H6, 02.01.2011. On soil under *Pinus* spp.

Hygrophorus *Hygrophoraceae, Agaricomycetes*
63. ◊ ***Hygrophorus arbustivus*** Fr.
43°05'2.38"N 12°27'36.8"E, E5, 02.01.2011. On soil associated with *Q. cerris*.
64. ◊ ***Hygrophorus roseodiscoideus*** Bon & Chevassut
43°05'2.18"N 12°27'37.9"E, E5, 13.01.2011. On soil associated with *Q. cerris*.

Hypholoma *Strophariaceae, Agaricomycetes*
65. ***Hypholoma fasciculare*** (Huds.) P. Kumm.
43°04'52.1"N 12°27'59.8"E, H10, 10.11.2011. On decayed wood of *Q. farnetto*.

Infundibulicybe *Tricholomataceae, Agaricomycetes*
66. ***Infundibulicybe costata*** (Kühner & Romagn.) Harmaja
43°04'47.8"N 12°28'10.9"E, I13, 10.11.2011. On soil or in leaf litter in *Q. farnetto* woodland.
67. ***Infundibulicybe geotropa*** (Bull.) Harmaja
43°04'49.2"N 12°28'04.64" E., I11, 10.11.2011. On soil associated with *Q. farnetto*.
68. ***Infundibulicybe gibba*** (Pers.) Harmaja
43°04'49.2"N 12°28' 04.64"E, I11, 14.11.2011. On soil amongst leaf litter in *Q. farnetto* woodland.

Inocybe *Inocybaceae, Agaricomycetes*
69. ◊ ***Inocybe geophylla*** **var.** ***geophylla*** (Fr.) P. Kumm.
43°04'52.1"N 12°27'59.8"E, H10, 05.12.2011. On soil in *Q. farnetto* woodland.

Laccaria *Hydnangiaceae, Agaricomycetes*
70. ***Laccaria laccata*** (Scop.) Cooke
43°04'54"N 12°27'59.3"E, G7, 10.11.2011. On soil associated with *C. betulus*.

Lactarius *Russulaceae, Agaricomycetes*
71. ◊ ***Lactarius acerrimus*** Britzelm.
43°04'51.6"N 12°28'4"E, G11, 10.08.2011. On soil associated with *Q. farnetto*.
72. ◊ ***Lactarius chrysorrheus*** Fr.

43°04'59.1"N 12°27'38.9"E, F6, 27.11.2011. On soil associated with *Q. ilex*.

73. ***Lactarius piperatus*** (L.) Pers.
43°04'52.5"N 12°27'53.1"E, H9, 27.11.2011. On soil in *Q. farnetto* woodland.

74. ◊ ***Lactarius vellereus*** (Fr.) Fr.
43°04'55.8"N 12°27'42.2"E, G6, 14.11.2011. On soil associated with *Q. ilex*.

75. ***Lactarius volemus*** (Fr.) Fr.
43°04'46.1"N 12°27'42.9"E, L6, 11.11.2011. On soil associated with *Q. cerris*.

Leccinum *Boletaceae, Agaricomycetes*

76. ***Leccinum carpini*** (R. Schulz) M.M. Moser ex D.A. Reid.
43°04'46.7"N 12°28'05.7"E, L11, 10.11.2011. On soil in *Q. farnetto* woodland.

77. ***Leccinum crocipodium*** (Letell.) Watling
43°04'52.4"N 12°27'55.8"E, H9, 10.08.2011. On soil associated with *Q. farnetto*.

Lepiota *Agaricaceae, Agaricomycetes*

78. ***Lepiota clypeolaria*** (Bull.) P. Kumm.
43°04'49.5"N 12°28'04.11"E, H11, 23.11.2011. On decayed leaf litter or soil in *Q. farnetto* woodland.

Lepista *Tricholomataceae, Agaricomycetes*

79. ***Lepista nuda*** (Bull.) Cooke
43°04'49.2"N 12°27'41.6"E, I6, 26.01.2011. On soil or decayed leaf litter in *Pinus* spp.

Lycoperdon *Agaricaceae, Agaricomycetes*

80. ***Lycoperdon excipuliforme*** (Scop.) Pers.
43°05'02.25"N 12°27'36.9"E, E5, 21.02.2011. On humic soil in *Q. cerris* woodland.

81. ◊ ***Lycoperdon molle*** Pers.
43°04'54.8"N 12°27'45.0"E, G7, 10.08.2011. On soil in *C. betulus* woodland.

82. ***Lycoperdon perlatum*** Pers.
43°04'54.8"N 12°27'44.7"E, G7, 10.11.2011. On soil or decayed wood (fallen trunks or stumps) in *C. betulus* woodland.

Macrolepiota *Agaricaceae, Agaricomycetes*

83. ***Macrolepiota konradii*** (Huijsman ex P.D. Orton) M.M. Moser
43°04'49.5"N 12°28'03.91"E, H11, 23.11.2011. On soil in *Q. farnetto* woodland.

Marasmius *Marasmiaceae, Agaricomycetes*

84. ◊ ***Marasmius bulliardii*** Quél.
43°04'55.6"N 12°27'56.4"E, G10, 27.11.2011. On fallen and decayed leaves of *Q. farnetto* trees in woodland.

85. ◊ ***Marasmius rotula*** (Scop.) Fr.
43°04'45"N 12°28'10.9"E, L13, 10.11.2011. On wood of *Q. farnetto*.

Mycena *Mycenaceae, Agaricomycetes*

86. ◊ ***Mycena acicula*** (Schaeff.) P. Kumm.
43°04'50.5"N 12°27'44"E, L13, 27.11.2011. On soil among mosses and leaf litter on *Q. farnetto* woodland.

87. ◊ ***Mycena adscendens*** (Lasch) Maas Geest.
43°04'54.9"N 12°27'45"E, G7, 10.11.2011. On decayed woody debris (fallen cones, twigs, sticks, stems, or nut shells) of *C. betulus* trees.

88. ◊ ***Mycena clavicularis*** (Fr.) Gillet
43°04'49.5"N 12°27'43.6"E, I7, 10.11.11. Amongst litter and on wet bark of living trees of *Q. petraea*.
89. ◊ ***Mycena corynephora*** Maas Geest.
43°04'54.0"N 12°27'44.5"E, H7, 10.11.2011. On damp bark of living *Q. petraea* trees, often amongst mosses.
90. ◊ ***Mycena epipterygia*** (Scop.) Gray
43°04'453.7"N 12°28'08.1"E, L12, 14.11.2011. On small woody fragments in *Q. farnetto* woodland.
91. ◊ ***Mycena inclinata*** (Fr.) Quél.
43°04'46"N 12°28'09.14"E, L13, 10.11.2011. On decayed wood of *Q. farnetto*.
92. □ ***Mycena interrupta*** (Berk.) Sacc.
43°04'45.9"N 12°28'07.5"E, H7, 10.11.2011. On fallen and decayed wood of *Q. petraea*.
93. ◊ ***Mycena maculata*** P.Karst.
43°04'46"N 12°28' 09.14"E, L13, 10.11.2011. On decayed wood of *Q. farnetto*.
94. ***Mycena pelianthina*** (Fr.) Quél.,
43°04'53.5"N 12°27'44.8"E, H7, 14.11.2011. On soil and leaf litter in *Q. petraea* woodland.
95. ◊ ***Mycena polygramma*** (Bull.) Gray
43°04'46.0"N 12°28'08.6"E, L12, 05.12.2011. On decayed wood of *Q. farnetto* trees and shrubs.
96. ◊ ***Mycena pura*** (Pers.) P. Kumm.
43°04'50.5"N 12°27'41.1"E, I6, 10.11.2011. On soil or litter in *C. betulus* woodland.
97. ***Mycena rosea*** Gramberg
43°04'49.4"N 12°27'36.9"E, I5, 14.11.2011. On soil or decayed leaf litter associated with *Q. cerris* woodland.
98. ◊ ***Mycena speirea*** (Fr.) Gillet
43°04'50.5"N 12°27'41.1"E, I6, 27.12.2011. On decayed wood or fallen bark in *C. betulus* woodland.

Mycetinis *Marasmiaceae, Agaricomycetes*
99. ◊ ***Mycetinis alliaceus*** (Jacq.) Earle ex A.W. Wilson & Desjardin
43°04'46.1"N 12°28'09.1"E, L12, 05.12.2011. On soil among leaf litter in *Q. farnetto* woodland.

Panaeolina Incertae sedis, *Agaricomycetes*
100. ◊ ***Panaeolina foenisecii*** (Pers.) Maire
43°04'55.4"N 12°27'42.4" E, G6, 14.11.2011. On soil amongst grass in *Q. ilex* woodland.

Panellus *Mycenaceae*, *Agaricomycetes*
101. ◊ ***Panellus stipticus*** (Bull.) P. Karst.
43°04'50.6"N 12°27'43.1"E, I7, 23.11.2011. On dead wood of *Q. petraea*.

Pisolithus *Sclerodermataceae, Agaricomycetes*
102. ◊ ***Pisolithus arhizus*** (Scop.) Rauschert
43°04'52.8"N 12°27'39.7"E, H6, 09.09.2011. On soil in *Q. petraea* woodland.

Pluteus *Pluteaceae, Agaricomycetes*
103. ◊ ***Pluteus petasatus*** (Fr.) Gillet
43°04'54.1"N 12°27'55.2"E, H9, 10.11.2011. On decayed wood of *Q. farnetto*.

Psathyrella *Psathyrellaceae, Agaricomycetes*
104. ◊ ***Psathyrella candolleana*** (Fr.) Maire
43°04'50.2"N 12°28'05.6"E, I12, 13.6.2011. On soil and decayed wood in *Q. farnetto* woodland.

Pseudoclitocybe *Tricholomataceae, Agaricomycetes*
105. ◊ ***Pseudoclitocybe cyathiformis*** (Bull.) Singer
43°04'50.0"N 12°28'11.1"E, I13, 10/11/2011. On soil or well rotted stumps in *Q. farnetto* woodland.

Ramaria *Gomphaceae, Agaricomycetes*
106. ◊ ***Ramaria stricta*** (Pers.) Quél.
43°04'50.4"N 12°27'43.2"E, I7, 14.11.2011. On decayed wood of *Q. petraea*.

Rhodocollybia *Marasmiaceae, Agaricomycetes*
107. ◊ ***Rhodocollybia butyracea*** (Bull.) Lennox
43°04'54.1"N 12°27'57.2"E, G10, 14.11.2011. On soil amongst litter under *Q. farnetto*.

Rhodocybe *Entolomataceae, Agaricomycetes*
108. ◊ ***Rhodocybe gemina*** (Paulet) Kuyper & Noordel.
43°04'51.0"N 12°27'40.9"E, H6, 05.12.2011. On soil in *Q. petraea* woodland.

Russula *Russulaceae, Agaricomycetes*
109. ***Russula cyanoxantha*** (Schaeff.) Fr.
43°04'49.7"N 12°27'43.8"E, I7, 03.10.2011. On soil associated with *Q. petraea*.
110. ***Russula delica*** Fr.
43°04'52.5"N 12°27'53.1"E, H9, 27.11.2011. On soil in *Q. farnetto* woodland.
111. ***Russula fragilis*** Fr.
43°04'50.4"N. 12°27'42.9" E, I6, 16.12.2011. On soil in *Q. cerris* woodland.
112. ***Russula grisea*** (Batsch) Fr.
43°04'51.4"N 12°27'57.2"E, H10, 10.08.2011. On soil in *Q. farnetto* woodland.
113. ***Russula heterophylla*** (Fr.) Fr.
43°04'47.7"N 12°28'05.1"E, L11, 16.12.2011. On soil in *Q. farnetto* woodland.
114. ***Russula maculata*** Quél.
43°04'51,4"N 12°28'01,0"E, H11, 09/09/2011. On soil in *Q. farnetto* woodland.
115. ***Russula persicina*** Krombh.,
43°04'55.4"N 12°27'41.9"E, F6, 05.12.2011. On soil in *Q. ilex* woodland.
116. ***Russula vesca*** Fr.
43°04'48.5"N 12°28'05.2"E, I11, 10.08.2011. On soil in *Q. farnetto* woodland.
117. ***Russula virescens*** (Schaeff.) Fr.
43°04'51.4"N 12°28'01.1"E, H11, 20.06.2011. On soil in *Q. farnetto* woodland.

Stereum *Stereaceae, Agaricomycetes*
118. ◊ ***Stereum hirsutum*** (Willd.) Pers.
43°04'51"N 12°27'45.4"E, H7, 26.01.2011. On fallen and decayed wood of *Q. petraea*.

Stropharia *Strophariaceae, Agaricomycetes*
119. ◊ ***Stropharia aeruginosa*** (Curtis) Quél.
43°04'54.1"N 12°27'59.1" E., H10, 14.11.2011. On soil in *Q. farnetto* woodland.

Suillus *Suillaceae, Agaricomycetes*
120. ◊ ***Suillus collinitus*** (Fr.) Kuntze
43°04'59.7"N 12°27'39.3"E, F6, 14.11.2011. On soil associated with *Q. ilex*.

Tapinella *Tapinellaceae, Agaricomycetes*
121. ◊ ***Tapinella atrotomentosa*** (Batsch) Šutara
43°04'53.9"N 12°27'45.4"E, H7, 02.01.2011. On decayed wood of *Q. petraea*.

Tremella *Tremellaceae Tremellomycetes*
122. ◊ ***Tremella mesenterica*** Retz.
43°04'51.6"N 12°28'0.57"E, H10, 10.10.2011. On decayed wood of *Q. farnetto*.
123. □ ***Tremella aurantia*** Schwein.
43°04'51"N 12°27'45.4"E, H7, 26.01.2011. On fruitbodies of *Stereum hirsutum*.

Trichaptum *Polyporaceae, Agaricomycetes*
124. ◊ ***Trichaptum biforme*** (Fr.) Ryvarden
43°04'52.2"N 12°27'50.2"E, H8, 29.01.2011. On fallen and decayed wood of *Q. farnetto*.

Tricholoma *Tricholomataceae, Agaricomycetes*
125. ***Tricholoma orirubens*** Quél.
43°04'53.1"N 12°27'52.1"E, H9, 14.11.2011. On soil amongst leaf litter in *Q. farnetto* woodland.
126. ***Tricholoma scalpturatum*** (Fr.) Quél.
43°05'02.13"N 12°27'38.2"E, E6, 05.12.2012. On soil in *Pinus* sp. plantations.
127. ***Tricholoma sulphureum*** (Bull.) P. Kumm.
43°04'52.9"N 12°27'57.1"E, H10, 16.12.2011. On soil associated with *Q. farnetto*.
128. ***Tricholoma terreum*** (Schaeff.) P. Kumm.
43°04'52.8"N 12°27'57.3"E, H10, 27.11.2011. On soil associated with *Q. farnetto*.
129. ◊ ***Tricholoma triste*** (Scop.) Quél.
43°04'47.9"N 12°28'11.7"E, L13, 27.11. 2011. On soil associated with *Q. farnetto*.

Tubaria *Inocybaceae, Agaricomycetes*
130. ◊ ***Tubaria furfuracea*** (Pers.) Gillet
43°04'46.2"N 12°28'11.6"E, L13, 26.01.2011. On wood (fallen twigs, sticks, woodchips etc.) in *Q. farnetto* woodland**.**
131. ◊ ***Tubaria hiemalis*** Romagn. ex Bon **var. *hiemalis***
43°04'47.6"N 12°28'10.5"E, L13, 21.02.2011. On wood (fallen twigs, sticks, woodchips etc.) in *Q. farnetto* woodland.

Xerocomus *Boletaceae, Agaricomycetes*
132. ◊ ***Xerocomus roseoalbidus*** Alessio & Littini
43°04'50.5"N 12°27'55.4"E, H9, 10.08.2011. On dry soils under *Q. farnetto*.
133. ***Xerocomus subtomentosus*** (L.) Quél.
43°04'50.5"N 12°27'55.6"E., H9, 10.08.2011. On soil associated with *Q. farnetto*.

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