

The hypogeous fungi from Sicily (southern Italy): new additions

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Abstract. The distribution and ecology of forty hypogeous fungi from Sicily (southern Italy) is described. *Hysterangium stoloniferum*, *Protoglossum aromaticum*, *Sclerogaster compactus* and *Tuber maculatum* are reported as new records from Sicily. *Gymnomyces xanthosporus* and *Melanogaster umbriniglieba* are also new for Italy.

Key words: distribution, ecology, hypogeous fungi, Sicily

Introduction

The ecology and distribution of forty-nine hypogeous and semi-hypogeous fungi, growing in different Sicilian forest ecosystems, was previously studied by Venturella *et al.* (2004a, b, 2006). Further investigation in different natural and artificial woods of Sicily were carried out in the last two years. The up-to-date number of hypogeous and semi-hypogeous fungi of Sicily, considering the previous number of taxa reported plus the new additions reported here, currently corresponds to fifty-four taxa.

Materials and Methods

A number of different forest ecosystems, located at different altitudinal levels, were investigated in Sicily during the period February 2006 – December 2007. The identification of hypogeous fungi was carried out on fresh ascomata and basidiomata, and the microscopic features were observed in an aqueous solution with a DMLB Leica microscope. The scientific binomials and trinomials of recorded taxa were according to the monograph of Montecchi & Sarasini (2000) up-to-date according to Index Fungorum (www.indexfungorum.org). The

date and localities of collection, the cartographic references, the habitats and the altitudes of each taxa were listed in the paragraph of data recorded and included in this paper. The distributive data were referred to the grid map 1:50,000 of the Official Map of the Italian State (I.G.M.I.), following the methodology proposed by Padovan (1994). The herbarium specimens are kept in the *Herbarium Mediterraneum* (PAL).

List of species

Balsamia vulgaris Vittad. (*Helvellaceae*)

Localities: Contrada Vaccarizzo, Bosco di Santo Pietro, Caltagirone (province of Catania), alt. 290 m, 644 133, 23 Feb 2006, glades of *Quercus suber* L. woods, at the base of plants of *Cistus monspeliensis* L. and *C. creticus* L.; Piano Zucchi, Isnello (province of Palermo), alt. 1100 m, 609 122, 20 Feb 2006, woods of *Quercus ilex* L.

Elaphomyces anthracinus Vittad. (*Elaphomycetaceae*)

Localities: Casa Zerbetto, San Fratello (province of Messina), alt. 950 m, 611 112, 11 Dec 2007, woods of *Q. ilex*; Pizzo Renatura, San Fratello (province of Messina), alt. 900 m, 611 114, 11 Dec 2007, woods of *Quercus cerris* L.

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Endogone flammicorona Trappe & Gerd. (*Endogonaceae*)

Localities: Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, at the base of plants of *Pinus halepensis* Miller and *Pinus pinea* L.; Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, at the base of plants of *Corylus avellana* L.

Genea fragrans (Wallr.) Sacc. (*Pyronemataceae*)

Localities: Casitti di Sopra, Tortorici (province of Messina), alt. 900 m, 599 234, 19 Feb 2007, hazel-tree cultivation; Fossochiodo, Raccuia (province of Messina), alt. 880 m, 599 224, 19 Feb 2007, hazel-tree cultivation; Pizzo Mondello, Palazzo Adriano (province of Palermo), alt. 1000 m, 620 331, 21 Feb 2006, woods of *Q. ilex*; S. Domenica, Tortorici (province of Messina), alt. 680 m, 599 321, 19 Feb 2007, hazel-tree cultivation; San Nicolò, Raccuia (province of Messina), alt. 660 m, 599 224, 1 Dec 2006, hazel-tree cultivation; Santuario Piazza Vecchia, Piazza Armerina (province of Enna), alt. 560 m, 21 Feb 2006, mixed wood of *P. pinea*, *Q. ilex*, *Q. pubescens* Willd. s. lat. and *Populus alba* L.

Genea lespiaultii Corda (*Pyronemataceae*)

Localities: Monte Fossa del Lupo, San Fratello (province of Messina), alt. 1200 m, 611 121, 11 Dec 2007, mixed woods of *F. sylvatica* L. and *Ilex aquifolium* L.; Monticelli, Castelbuono (province of Palermo), alt. 1150 m, 610 432, 4 Dec 2006, woods of *Q. ilex*.

Genea sphaerica Tul. & C. Tul. (*Pyronemataceae*)

Locality: Contrada dell'Occhio, San Fratello (province of Messina), alt. 1040 m, 611 113, 3 Dec 2006, woods of *Q. cerris*.

Genea verrucosa Vittad. (*Pyronemataceae*)

Localities: Casitti di Sopra, Tortorici (province of Messina), alt. 900 m, 599 234, 19 Feb 2007, hazel-tree cultivation; Catena, Linguaglossa (province of Catania), alt. 620 m, 22 Dec 2006, hazel-tree cultivation; Contrada Vaccarizzo (Bosco di Santo Pietro), Caltagirone (province of Catania), alt. 290 m, 644 133, 23 Feb 2006, mixed woods of *Q. suber* and *Q. ilex* with presence of *C. monspeliensis* and *C. creticus* in the brushwood; Fossochiodo, Raccuia (province of Messina), alt. 880 m, 599 224, 19 Feb 2007, hazel-tree cultivation; Imera meridionale, purifier of Petralia Sottana (province of Palermo), alt. 836 m, 610 323, 6 Dec 2006, *P. alba* and *Q. pubescens* s. lat.; Irianni, S. Angelo di Brolo (province of Messina), alt. 730 m, 599 241, 19 Feb 2007, hazel-tree cultivation; Monte Coffali, Librizzi (province of Messina), alt. 690 m, 599 214, 1 Dec 2006, hazel-tree cultivation; Monte Fossa del Lupo, San Fratello (province of Messina), alt. 1200 m, 611 121, 11 Dec 2007, *F. sylvatica* and *I. aquifolium*; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), alt. 550 m, 594 214-594 422, 21 Feb 2006, mixed wood of *Q. ilex*, *Q. suber*, *P. pinea* with plants of *Erica multiflora* L. and *C. creticus* in the brushwood; Monte San Calogero,

Termini Imerese (province of Palermo), alt. 690 m, 609 431, 21 Feb 2006, mixed woods of *Quercus virgiliana* (Ten.) Ten. and *Q. ilex*; Ragale, Ucria (province of Messina), alt. 550 m, 599 231, 19 Feb 2007, hazel-tree cultivation; S. Domenica, Tortorici (province of Messina), alt. 680 m, 599 321, 19 Feb 2007, hazel-tree cultivation; San Nicolò, Raccuia (province of Messina), alt. 660 m, 599 224, 1 Dec 2006, hazel-tree cultivation; Santa Nicola, Polizzi Generosa (province of Palermo), alt. 658 m, 609 221, 20 Feb 2007, hazel-tree cultivation; Serro Alloro, Tortorici (province of Messina), alt. 740 m, 599 234, 19 Feb 2007, hazel-tree cultivation; Terra di Bove, Buccheri (province of Ragusa), alt. 740 m, 645 134, 23 Feb 2006, *Q. pubescens* s. lat.

Gymnomyces xanthosporus (Hawker) A.H. Sm. (*Russulaceae*)

Locality: Casa Vina, Cesarò (province of Messina), alt. 1200 m, 612 343, 3 Dec 2006, wood of *Q. cerris*.

Note: This is the first record from Italy.

Hymenogaster bulliardii Vittad. (*Hymenogasteraceae*)

Locality: Cima Cucco, Godrano (province of Palermo), alt. 981 m, 608 342, 5 Dec 2006, mixed wood of *Quercus leptobalanos* Guss. and *Q. ilex*.

Hymenogaster citrinus Vittad. (*Hymenogasteraceae*)

Localities: Crocetta, Longi (province of Messina), 630 m, 599 323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *Ostrya carpinifolia* Scop., *Acer campestre* L. and *Fraxinus ornus* L.; Montalbano Elicona (in the surroundings of the village) (province of Messina), alt. 850 m, 600 333, 22 Feb 2006, hazel-tree cultivation; Pizzo Renatura, San Fratello (province of Messina), alt. 900 m, 611 114, 11 Dec 2007, woods of *Q. cerris*; Santa Nicola, Polizzi Generosa (province of Palermo), alt. 658 m, 609 221, 13 Dec 2007, hazel-tree cultivation.

Hymenogaster hessei Soehner (*Hymenogasteraceae*)

Localities: Monte Coffali, Librizzi (province of Messina), alt. 690 m, 599 214, 1 Dec 2006, hazel-tree cultivation; Serro Alloro, Tortorici (province of Messina), alt. 740 m, 599 234, 19 Feb 2007, hazel-tree cultivation.

Hymenogaster luteus Vittad. (*Hymenogasteraceae*)

Localities: Bosco della Favara, Montemaggiore Belsito (province of Palermo), alt. 700 m, 21 Feb 2006, woods of *Q. pubescens* s. lat.; Casa Volpe, San Fratello (province of Messina), alt. 1100 m, 611 124, 11 Dec 2007, *Populus nigra* L., *Cupressus sempervirens* L., *P. alba* and *Cedrus atlantica* (Endl.) Manetti; Cima Cucco, Godrano (province of Palermo), alt. 981 m, 608 342, 5 Dec 2006, mixed wood of *Q. ilex* and *Q. leptobalanos*; Crocetta, Longi (province of Messina), alt. 630 m, 599 323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *O. carpinifolia*, *A. campestre* and *F. ornus*; Crocifisso, Corleone (province of Palermo), alt. 820 m, 608 342, 5 Dec 2006, woods of *Q. ilex*; Imera meridionale, purifier of Petralia Sottana (province of Palermo), alt. 836 m, 610 323, 6 Dec 2006, *P. alba* and *Q. pubescens* s. lat.; Portella

Arena, Isnello (province of Palermo), alt. 1520 m, 610 343, 6 Dec 2006, mixed woods of *F. sylvatica*, *C. atlantica* and *P. nigra*; Santa Nicola, Polizzi Generosa (province of Palermo), alt. 658 m, 609 221, 13 Dec 2007, hazel-tree cultivation; "Sentiero Natura" of Piano Pomo, Castelbuono (province of Palermo), alt. 1450 m, 610 432, 4 Dec 2006, woods of *Q. ilex* and *F. sylvatica*; Sentiero Via Crucis, Crocifisso, Corleone (province of Palermo), alt. 820 m, 608 342, 5 Dec 2006, reforestation of *P. halepensis*, *P. pinea* and *C. sempervirens*.

Hymenogaster lycoperdineus Vittad. (*Hymenogasteraceae*)

Localities: Casa Zerbetto, San Fratello (province of Messina), alt. 950 m, 611 112, 11 Dec 2007, woods of *Q. ilex*; Casa Volpe, San Fratello (province of Messina), alt. 1100 m, 611 124, 11 Dec 2007, mixed woods of *Populus nigra*, *C. sempervirens*, *P. alba* and *C. atlantica*; Contrada Saraceno, Castelbuono (province of Palermo), alt. 460 m, 610 423, 6 Dec 2006, at the base of plants of *Tilia cordata* Miller; Crocetta, Longi (province of Messina), alt. 630 m, 599 323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *O. carpinifolia*, *A. campestre* and *F. ornus*; Imera meridionale, purifier of Petralia Sottana (province of Palermo), alt. 836 m, 610 323, 6 Dec 2006, mixed woods of *P. alba* and *Q. pubescens* s. lat.; Pizzo Renatura, San Fratello (province of Messina), alt. 900 m, 611 114, 11 Dec 2007, woods of *Q. cerris*; Monte Coffali, Librizzi (province of Messina), alt. 690 m, 599 214, 1 Dec 2006, hazel-tree cultivation; Contrada Saraceno, Castelbuono (province of Palermo), alt. 460 m, 610 423, 6 Dec 2006, *P. nigra*; Mezz'Agosto, Sant'Angelo di Brolo (province of Messina), alt. 260 m, 599 132, 1 Dec 2006, hazel-tree cultivation; "Sentiero Natura Via Crucis", Crocifisso, Corleone (province of Palermo), alt. 820 m, 608 342, 5 Dec 2006, reforestation of *P. halepensis*, *P. pinea* and *C. sempervirens*; Piano Sempria, Castelbuono (province of Palermo), alt. 1200 m, 610 432, 5 Dec 2006, mixed wood of *Q. ilex* and *F. sylvatica*; Cozzo Pomieri, Petralia Sottana, (province of Palermo), alt. 1300 m, 610 342, 5 Dec 2006, mixed woods of *F. sylvatica*, *Q. petraea* (Mattuschka) Liebl. and *I. aquifolium*; Cima Cucco, Godrano (province of Palermo), alt. 981 m, 608 342, 5 Dec 2006, mixed woods of *Q. ilex* and *Q. leptobalanos*; Crocifisso, Corleone (province of Palermo), alt. 820 m, 608 342, 5 Dec 2006, woods of *Q. ilex*.

Hymenogaster olivaceus Vittad. (*Hymenogasteraceae*)

Localities: Casa Volpe, San Fratello (province of Messina), alt. 1100 m, 611 124, 11 Dec 2007, mixed woods of *Populus nigra*, *C. sempervirens*, *P. alba* and *C. atlantica*; Imera meridionale, purifier of Petralia Sottana (province of Palermo), alt. 836 m, 610 323, 6 Dec 2006, mixed woods of *P. alba* and *Q. pubescens*; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), alt. 550 m, 594 214, 6 Dec 2006, woods of *Q. ilex*; Piano Sempria, Castelbuono (province of Palermo), alt. 1200 m, 610 432, 5 Dec 2006, mixed woods of *Q. ilex* and *F. sylvatica*; Santa Nicola, Polizzi Generosa (province of Palermo), alt. 658 m, 609 221, 6 Dec 2006, hazel-tree cultivation.

Hymenogaster populetorum Tul. (*Hymenogasteraceae*)

Localities: Cannelle, San Fratello (province of Messina), alt. 1040 m, 611 121, 3 Dec 2006, woods of *Q. cerris*; Cima Cucco, Godrano (province of Palermo), alt. 981 m, 608 342, 5 Dec 2006, mixed woods of *Q. ilex* and *Q. leptobalanos*; Contrada dell'Occhio, San Fratello (province of Messina), alt. 1040 m, 611 113, 11 Dec 2007, woods of *Q. cerris*; Contrada Saraceno, Castelbuono (province of Palermo), alt. 460 m, 610 423, 6 Dec 2006, at the base of plants of *Q. virgiliana*; Monte Coffali, Librizzi (province of Messina), alt. 690 m, 599 214, 1 Dec 2006, hazel-tree cultivation; Mezz'Agosto, Sant'Angelo di Brolo (province of Messina), alt. 260 m, 599 132, 1 Dec 2006, hazel-tree cultivation; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), 594 123, alt. 550 m, 21 Feb 2006, mixed wood of *Q. ilex*, *Q. suber* and *P. pinea* with plants of *E. multiflora* and *C. creticus* in the brushwood; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), alt. 550 m, 5 Dec 2006, wood of *Q. ilex*; Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, at the base of plants of *C. avellana*; Portella dello Zoppo, Floresta (province of Messina), alt. 1200 m, 612 114, 3 Dec 2006, at the base of plants of *Pinus nigra*; Santa Nicola, Polizzi Generosa (province of Palermo), alt. 658 m, 609 221, 13 Dec 2007, hazel-tree cultivation.

Hymenogaster vulgaris Tul. & C. Tul. (*Hymenogasteraceae*)

Localities: Montalbano Elicona (in the surroundings of the village) (province of Messina), alt. 850 m, 600 333, 22 Feb 2006, hazel-tree cultivation; Monte Coffali, Librizzi (province of Messina), alt. 690 m, 599 214, 1 Dec 2006, hazel-tree cultivation; San Nicolò, Raccuia (province of Messina), alt. 660 m, 599 224, 1 Dec 2006, hazel-tree cultivation.

Hysterangium coriaceum R. Hesse (*Hysterangiaceae*)

Locality: Eraclea Minoa, Cattolica Eraclea (province of Agrigento), alt. 10 m, 635 111, 20 Feb 2006, mixed wood of *P. pinea*, *P. pinaster* Aiton and *Eucalyptus camaldulensis* Dehnh.

Hysterangium inflatum Rodway (*Hysterangiaceae*)

Locality: outfall of Belice river, Castelvetrano (province of Trapani), alt. 10 m, 10 Dec 2007, reforestation of *E. camaldulensis*.

Hysterangium stoloniferum Tul. & C. Tul. (*Hysterangiaceae*)

Locality: Monte San Calogero, Termini Imerese (province of Palermo), alt. 690 m, 609 431, 21 Feb 2006, mixed wood of *Q. ilex* and *Q. virgiliana*.

Note: It is recorded for the first time from Sicily while in Italy this species was found only in Emilia Romagna and Lombardia.

Leucogaster nudus (Hazsl.) Hollòs (*Leucogastraceae*)

Locality: Cozzo Pomieri, Petralia Sottana, (province of Palermo), alt. 1300 m, 610 342, 5 Dec 2006, mixed woods of *F. sylvatica*, *Q. petraea* and *I. aquifolium*.

Melanogaster ambiguus (Vittad.) Tul. & C. Tul. (*Melanogastraceae*)

Localities: Casitti di Sopra, Tortorici (province of Messina), alt. 900 m, 599 234, 19 Feb 2007, hazel-tree cultivation; Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, at the base of plants of *C. avellana*.

Melanogaster broomeanus Berk. (*Melanogastraceae*)

Localities: Crocetta, Longi (province of Messina), 630 m, 599 323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *O. carpinifolia*, *A. campestre* and *F. ornus*; Monte Coffali, Librizzi (province of Messina), alt. 690 m, 599 214, 1 Dec 2006, hazel-tree cultivation; Monte dei Saraceni, S. Angelo di Brolo (province of Messina), alt. 700 m, 599 214, 1 Dec 2006, hazel-tree cultivation; San Nicolò, Raccuia (province of Messina), alt. 660 m, 599 224, 1 Dec 2006, hazel-tree cultivation.

Melanogaster umbrinogleba Trappe & Guzmán (*Melanogastraceae*)

Localities: Crocifisso, Corleone (province of Palermo), alt. 820 m, 608 342, 5 Dec 2006, woods of *Q. ilex*; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), alt. 550 m, 594 214-594 422, 21 Feb 2006, mixed woods of *Q. ilex* and *Q. pubescens*.

Note: This is the first record from Italy.

Melanogaster variegatus (Vittad.) Tul. & C. Tul. (*Melanogastraceae*)

Localities: Cozzo Pomieri, Petralia Sottana (province of Palermo), alt. 1300 m, 610 342, 6 Dec 2006, mixed woods of *F. sylvatica*, *Q. petraea* and *I. aquifolium*; Crocetta, Longi (province of Messina), 630 m, 599323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *O. carpinifolia*, *A. campestre* and *F. ornus*; Mezz'Agosto, Sant'Angelo di Brolo (province of Messina), alt. 260 m, 599 132, 1 Dec 2006, hazel-tree cultivation.

Octaviania asterosperma Vittad. (*Octavianinaceae*)

Locality: S.S. 289 Km 48, Cesarò (province of Messina), alt. 1220 m, 612 342, 3 Dec 2006, at the base of plants of *P. nigra*.

Protoglossum aromaticum (Velen.) J.M. Vidal (*Hymenogasteraceae*)

Locality: San Nicolò, Raccuia (province of Messina), alt. 660 m, 599 224, 1 Dec 2006, hazel-tree cultivation.

Note: It is recorded for the first time from Sicily while in Italy this species was found only in Emilia Romagna and Lombardia.

Reddellomyces donkii (Malençon) Trappe, Castellano & Malajczuk (*Tuberaceae*)

Localities: Contrada Pampilone, (province of Enna), alt. 280 m, 631 244, 22 Feb 2006, reforestation of *E. camaldulensis*; Cozzo della Guardia (province of Caltanissetta), alt. 500 m,

631 311, 22 Feb 2006, reforestation of *P. pinea*, *C. sempervirens* and *E. camaldulensis*; S. Giuseppe, Pietraperzia (province of Enna), alt. 470 m, 631 323, 22 Feb 2006, reforestation of *E. camaldulensis*; San Martino delle Scale, Monreale (province of Palermo), alt. 550 m, 594 214-594 422, 21 Jan 2007, reforestation of *P. halepensis* and *P. pinea*.

Rhizopogon roseolus (Corda) Th. Fr. (*Rhizopogonaceae*)

Localities: Monte Mela Grande, San Martino delle Scale, Monreale (province of Palermo), alt. 700 m, 594 214, 23 Sept 2006, 21 Oct 2006, reforestation of *P. pinea* and *P. halepensis*; Eraclea Minoa, Cattolica Eraclea (province of Agrigento), alt. 15 m, 635 111, 20 Feb 2006, mixed woods of *P. pinea*, *P. pinaster* and *E. camaldulensis*; Bosco di Scorace, Buseto Palizzolo (province of Trapani), alt. 560 m, 606 414, 22 Feb 2006, woods of *Q. suber* with presence of plants of *E. arborea* and *C. salvifolius*.

Schenella simplex T. Macbr. (*Stemonitidaceae*)

Locality: Contrada Vaccarizzo, Bosco di Santo Pietro, Caltagirone (province of Catania), alt. 290 m, 644 133, 23 Feb 2006, glades of *Q. suber* wood, at the base of plants of *C. monspeliensis* and *C. creticus*.

Sclerogaster compactus (Tul. & C. Tul.) Sacc. (*Octavianinaceae*)

Localities: Pizzo Mondello, Palazzo Adriano (province of Palermo), alt. 1000 m, 620 331, 21 Feb 2006, woods of *Q. ilex*; Bosco di Buonotte, Santo Stefano di Quisquina (province of Agrigento), alt. 769 m, 629 141, 21 Feb 2006, mixed woods of *P. pinea*, *P. halepensis*, *Q. ilex* and *C. sempervirens*.

Note: It is recorded for the first time from Sicily while in Italy this species was found only in Emilia Romagna and Lombardia.

Setchelliogaster tenuipes (Setch.) Pouzar (*Bolbitiaceae*)

Localities: S. Giuseppe, Pietraperzia (province of Enna), alt. 470 m, 631 323, 22 Feb 2006, reforestation of *E. camaldulensis*; Outfall of Belice river, Castelvetro (province of Trapani), alt. 10 m, 10 Dec 2007, reforestation of *E. camaldulensis*.

Tuber aestivum Vittad. (*Tuberaceae*)

Locality: Crocetta, Longi (province of Messina), alt. 630 m, 599 323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *O. carpinifolia*, *A. campestre* and *F. ornus*.

Tuber borchii Vittad. (*Tuberaceae*)

Localities: San Giuliano, Tortorici (province of Messina), alt. 580 m, 599 321, 19 Feb 2006, hazel-tree cultivation; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), alt. 550 m, 594 214-594 422, 21 Feb 2006, mixed woods of *Q. ilex*, *Q. suber*, *P. pinea* with plants of *E. multiflora* and *C. creticus* in the brushwood; Cozzo Pomieri, Petralia Sottana (province of Palermo), alt. 1300 m, 610 342, 5 Dec 2006, mixed woods of *F. sylvatica*, *Q. petraea* and *I. aquifolium*; Imera meridionale, purifier of Petralia Sottana (province of

Palermo), alt. 836 m, 610 323, 6 Dec 2006, mixed woods of *P. alba* and *Q. pubescens*; Monte San Calogero, Termini Imerese (province of Palermo), alt. 690 m, 609 431, 21 Feb 2006, woods of *Q. ilex*; Santuario Piazza Vecchia, Piazza Armerina (province of Enna), alt. 560 m, 21 Feb 2006, mixed woods of *P. pinea*, *Q. ilex*, *Q. pubescens* s. lat. and *P. alba*; Contrada Vaccarizzo, Bosco di Santo Pietro, Caltagirone (province of Catania), alt. 290 m, 644 133, 23 Feb 2006, glades of *Q. suber* woods, at the base of plants of *C. monspeliensis* and *C. creticus*; Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, mixed woods of *Q. cerris*, *C. sativa* and *Q. pubescens*; Santa Nicola, Polizzi Generosa (province of Palermo), alt. 658 m, 609 221, 13 Dec 2007, mixed woods of *Q. pubescens* s. lat. and *Salix pedicellata* Desf.; Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, mixed woods of *P. pinea* and *P. halepensis*.

Tuber brumale Vittad. (*Tuberaceae*)

Localities: Cima Cucco, Godrano (province of Palermo), alt. 981 m, 608 342, 5 Dec 2006, mixed woods of *Q. ilex* and *Q. leptobalanos*; Crocetta, Longi (province of Messina), alt. 630 m, 599 323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *O. carpinifolia*, *A. campestre* and *F. ornus*; Santa Nicola, Polizzi Generosa (province of Palermo), alt. 658 m, 609 221, 13 Dec 2007, hazel-tree cultivation; Montalbano Elicona (in the surroundings of the village) (province of Messina), alt. 850 m, 600 333, 22 Feb 2006, hazel-tree cultivation; Ragale, Ucria (province of Messina), alt. 550 m, 599 231, 19 Feb 2007, hazel-tree cultivation.

Tuber excavatum Vittad. (*Tuberaceae*)

Localities: Imera meridionale, purifier of Petralia Sottana (province of Palermo), alt. 836 m, 610 323, 6 Dec 2006, mixed woods of *P. alba* and *Q. pubescens* s. lat.; Cozzo Pomieri, Petralia Sottana (province of Palermo), alt. 1300 m, 610 342, 5 Dec 2006, mixed woods of *F. sylvatica*, *Q. petraea* and *I. aquifolium*.

Tuber maculatum Vittad. (*Tuberaceae*)

Locality: Santuario Piazza Vecchia, Piazza Armerina (province of Enna), alt. 560 m, 21 Feb 2006, mixed woods of *P. pinea*, *Q. ilex*, *Q. pubescens* s. lat. and *P. alba*.

Note: It is recorded for the first time from Sicily while in Italy this species was found only in Emilia Romagna and Lombardia.

Tuber nitidum Vittad. (*Tuberaceae*)

Locality: "Sentiero Via Crucis", Crocifisso, Corleone (province of Palermo), alt. 820 m, 608 342, 5 Dec 2006, reforestation of *P. halepensis*, *P. pinea* and *C. sempervirens*.

Tuber panniferum Tul. (*Tuberaceae*)

Locality: Crocetta, Longi (province of Messina), alt. 630 m, 599 323, 2 Dec 2006, mixed woods of *Q. ilex*, *Q. virgiliana*, *O. carpinifolia*, *A. campestre* and *F. ornus*.

Tuber puberulum Berk. & Broome (*Tuberaceae*)

Localities: Bosco di Buonanotte, Santo Stefano di Quisquina (province of Agrigento), alt. 769 m, 629 141, 21 Feb 2006, mixed woods of *P. pinea*, *P. halepensis*, *Q. ilex* and *C. sempervirens*; Bosco di Malabotta, Montalbano Elicona (province of Messina), alt. 1250 m, 613 442, 22 Feb 2006, mixed woods of *Q. cerris*, *C. sativa* and *F. sylvatica*; Contrada Paratore, Piazza Armerina (province of Enna), alt. 560 m, 22 Feb 2006, mixed woods of *Q. ilex*, *Q. pubescens* and *P. pinea*; La Donna, Santo Stefano di Quisquina (province of Agrigento), alt. 950 m, 620 233, 20 Feb 2006, reforestation of *P. pinea*, *P. halepensis* and *C. sempervirens*; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), alt. 550 m, 594 214-594 422, 5 Dec 2006, woods of *Q. ilex*; Monte Petroso (San Martino delle Scale), Monreale (province of Palermo), alt. 550 m, 594 214-594 422, 21 Feb 2006, mixed woods of *Q. ilex*, *Q. suber* and *P. pinea* with plants of *E. multiflora* and *Cistus creticus* in the brushwood; Monte San Calogero, Termini Imerese (province of Palermo), alt. 690 m, 609 431, 21 Feb 2006, mixed woods of *Q. ilex* and *Q. virgiliana*; Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, woods of *Q. ilex*, mixed woods of *P. pinea* and *P. halepensis*; Piano di Santa Venere, Carini (province of Palermo), alt. 592 m, 594 422, 21 Feb 2006, reforestation of *P. pinea*, *P. halepensis* and *C. sempervirens*; Pizzo Mondello, Palazzo Adriano (province of Palermo), alt. 1000 m, 620 331, 21 Feb 2006, woods of *Q. ilex*; Portella dello Zoppo, Floresta (province of Messina), alt. 1200 m, 612 114, 3 Dec 2006, *Pinus nigra*.

Tuber rufum Pico var. *rufum* (*Tuberaceae*)

Localities: Casa Volpe, San Fratello (province of Messina), alt. 1100 m, 611 124, 11 Dec 2007, mixed woods of *Populus nigra*, *C. sempervirens*, *P. alba* and *C. atlantica*; Cima Cucco, Godrano (province of Palermo), alt. 981 m, 608 342, 5 Dec 2006, mixed wood of *Q. ilex* and *Q. leptobalanos*; Contrada dell'Occhio, San Fratello (province of Messina), alt. 1040 m, 611 113, 6 Dec 2006, 11 Dec 2007, woods of *Q. cerris*; Contrada Saraceno, Castelbuono (province of Palermo), alt. 460 m, 610 423, 6 Dec 2006, woods of *Pinus nigra*; Monticelli, Castelbuono (province of Palermo), alt. 1150 m, 610 432, 4 Dec 2006, woods of *Q. ilex*; Ecological Park, Castell'Umberto (province of Messina), alt. 660 m, 599 311, 2 Dec 2006, at the base of plants of *Corylus avellana*; Piano di Santa Venere, Carini (province of Palermo), alt. 592 m, 594 422, 21 Feb 2006, reforestation of *P. pinea*, *P. halepensis* and *C. sempervirens*; Portella Colla, Isnello (province of Palermo), alt. 1430 m, 610 343, 6 Dec 2006, mixed woods of *Pinus nigra*, *F. sylvatica* and *C. atlantica*; Portella Santa Domenica, S. Salvatore di Fitalia (province of Messina), alt. 820 m, 14 Dec 2007, hazel-tree cultivation; Quacella, alt. 1150 m, 610 334, 6 Dec 2006, reforestation of *Pinus nigra* and *C. atlantica*; S. Domenica, Tortorici (province of Messina), alt. 680 m, 599 321, 19 Feb 2007, hazel-tree cultivation.

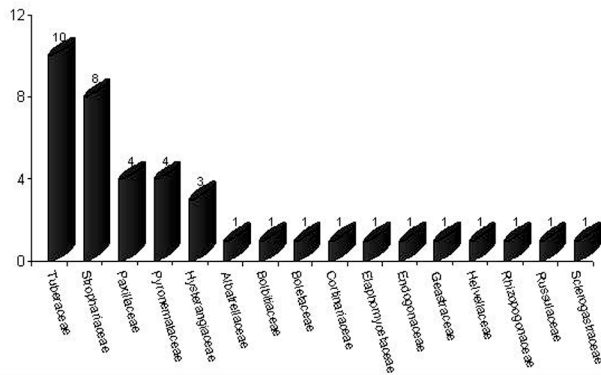


Fig. 1. Number of taxa per family

Results

In the framework of a broad census of the fungal diversity of Sicily, the recent availability of dogs trained in the search of hypogeous fungi allowed us to acquire an enhanced data base of information on the diversity of such interesting group.

The data reported in this paper contributed to provide some additional information on the ecology and distribution of forty taxa, some of them recorded for the first time in Italy and/or in Sicily. In particular these data showed that the most representative families (Fig. 1) are *Tuberaceae* (10 taxa) and *Strophariaceae* (8 taxa) and the high level of diversity (Fig. 2) arise from oak woods (28 taxa) followed by re-forestations (20 taxa), hazel-tree cultivation (16 taxa), mixed woods with prevalence of conifers (14 taxa), and beech woods (11 taxa). *Gymnomyces xanthosporus* and *Melanogaster umbrinogleba* are new records for Italy, besides *Hysterangium stoloniferum*, *Protoglossum aromaticum*, *Sclerogaster compactus* and *Tuber maculatum* are new reports for the Sicilian territory.

On the basis of data reported in previous publications (Venturella *et al.* 2004a, 2004b, 2006) and the new records reported in this paper the total number of hypogeous and semi-hypogeous fungi from Sicily currently stands at fifty-eight taxa (twenty-five ascomycetes, thirty-two basidiomycetes and one zygomycete) belonging to twenty-two genera included in eighteen families.

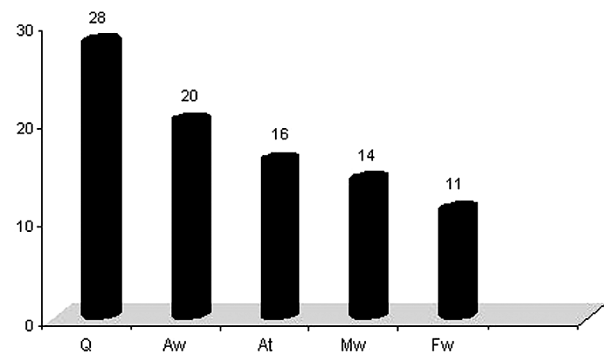


Fig. 2. Number of taxa per vegetation type. Q = oak woods; Mw = mixed woods with prevalence of conifers; Aw = re-forestations; At = hazel-tree cultivation; Fw = beech woods

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