Annotated checklist of Basidiomycota (subclass Agaricomycetidae) from the islands of Naxos and Amorgos (Cyclades, Greece)

Elias Polemis¹, Dimitrios M. Dimou¹,², Dimitrios Tzanoudakis³ & Georgios I. Zervakis¹,*

¹ Agricultural University of Athens, Laboratory of General and Agricultural Microbiology, Iera Odos 75, GR-11855 Athens, Greece (corresponding author’s e-mail: zervakis@aua.gr)
² Korytsas 10, GR-15343 Agia Paraskevi, Greece
³ University of Patras, Department of Biology, Panepistimioupoli, GR-26500 Rion, Greece

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Naxos and Amorgos are islands in the Aegean Sea with a typically arid to semiarid climate, the vegetation being dominated by thermo-Mediterranean shrubs. From the floristic point of view, both are among the most interesting islands of the Cyclades. However, no data were available on their fungal diversity. This work presents an annotated check-list of the basidiomycetes belonging to the subclass Agaricomycetidae (Agaricales and Boletales) from these two islands. A total of 142 species and subspecific taxa are recognized and assigned to 58 genera. The genus Simocybe as well as 21 taxa at the species or subspecies level constitute new records for Greece, while further 76 taxa represent first national reports for habitat, hosts and/or substrates. A brief description of key diagnostic characters — in conjunction with a discussion of pertinent literature — is provided for the most interesting findings.

Introduction

The Cyclades islands comprise one of the thirteen distinct phytogeographical regions of Greece according to the Flora Hellenica project (Strid & Tan 1997) (Fig. 1). Naxos is the largest island of the Cyclades (Figs. 1 and 2), with the surface area of 442 km². It is characterized by a remarkably varied bas-relief, and the three high mountain peaks (Zas 1004 m a.s.l., Koronos 998 m a.s.l. and Fanari 888 m a.s.l.). Geomorphologically, Naxos is divided into three distinct parts: (1) the mountainous part with high peaks and deep gorges, (2) the mainland plateaus, which are isolated by the mountainous parts, and (3) the relatively extended alluvial valleys in the west of the island. The geology of Naxos is very complex and a large variety of minerals are found; the dominant rock types are granite, marmorygian schist and marble. The climate of Naxos is characterized by an intensely hot summer with a dry period of almost seven months. The annual precipitation ranges between 300 and 400 mm and the wet period of the year starts in November and lasts until March, with the maximum precipitation in December.
and January. Mean monthly temperatures range from approximately 12 °C in winter to 25 °C in summer. Snowfall and frost may appear at altitudes above 600 m. In the mountainous mainland of the northern part of the island, the climatic conditions are considerably different from the coastal zone due to the prevailing north winds that increase humidity and lower the temperatures. In contrast, the southern part is significantly more arid. The hydrographic network of Naxos includes a few small rivers with constant flow in the north of the island.

Amorgos is the easternmost of the large islands of the Cyclades, with a surface area of 121 km², and its shape is elongate with a 33-km-long NE–SW axis, and a width varying between 1.5 and 6 km (Figs. 1 and 3). It is a mountainous and rocky island, and the highest peak (823 m a.s.l.) is found in the NE part of the island. The southeastern coast is extremely sheer, while a number of small alluvial valleys and beaches are present in the northwestern part. The main rock types of the island are schist and limestone. Climatic data for Amorgos are not available (there is no meteorological station on the island), but they are expected not to differ significantly from those available for Naxos due to their geographic proximity. Amorgos possesses limited water resources and only a few streams that become completely dry during the summer months.

From the floristic point of view, Naxos and Amorgos are among the most interesting islands of the Cyclades, both having high numbers of species, including several Greek and/or Cyclades endemics or even single-island endemics (three local endemics exist on both islands). Although several botanists have explored the islands, pertinent floristic information is available for Naxos only. According to Böhling (1994), the flora of Naxos consists of 931 taxa of vascular plants and its vegetation is mainly characterized by low shrubs and phrygana communities (e.g. Sarcopoterium spinosum, Genista acanthoclada, Coridothymus capitatus, Erica manipuliflora, Centaurea spinosa, Calicotome villosa, Phlomis fruticosa, Satureja thymbra, Cistus creticus and C. salviifolius). There are no forests on Naxos, but large stands with Acer sempervirens, Quercus cocciifera and Q. ilex, with trees 5–6 m high, are found in many localities; they are considered to be relicts of the indigenous sclerophyllous forests that once existed there. Few oak and
poplar trees (*Quercus pubescens, Q. ithaburensis* ssp. *macrolepis* and *Populus* spp.) form small thickets close to some villages, but they are considered allochthonous to the island (Böhling 1994). Conifers such as *Cupressus sempervirens*, *Pinus halepensis*, *P. brutia* and *P. pinea* were also introduced. *Platanus orientalis* dominates in wet ravines and streams, while *Alnus glutinosa* and *Salix alba* are occasionally present. As the streams get dry, trees are replaced by vegetation dominated by *Nerium oleander* and, close to estuaries, *Tamarix hampeanus*. In the littoral zone, *Juniperus oxycedrus* ssp. *macrocarpus*, *J. phoenicea* and *Pistacia lentiscus* often form a dense vegetation cover, which is more common in the south coasts of the island on limestone and terra rosa.

Although a floristic inventory of Amorgos has not yet been published, its vascular flora is estimated to include no fewer than 800 taxa (D. Tzanoudakis unpubl. data). As in the case of Naxos, the vegetation on Amorgos typically consists of low shrubs and phrygana such as *Euphorbia dendroides*, *E. acanthothamnos*, *Coridothymus capitatus*, *Salvia fruticosa*, *Ballota acetabulosa*, *Sarcopoterium spinosum*, *Genista acanthoclada*, *Erica manipuliflora*, *Centaurea spinosa*, *Calicotome villosa*, *Satureja thymbra*, *Cistus creticus* and *C. salviifolius*. At various localities, however, trees of mac-
quis vegetation (*Quercus coccifera*, *Juniperus phoenicea*, *Pistacia lentiscus* and *Rhamnus oleifolius*) are present. No hydrophilous trees are found on Amorgos, and only *Nerium oleander* grows close to some streams. Typical elements of the anthropogenic vegetation of the island are the extensive olive orchards in the Aigiali area.

The central Aegean islands (Cyclades), as is the case with several others parts of Greece, are very poorly investigated as regards their mushroom diversity. Particularly for Naxos and Amorgos, no pertinent data have previously been published, with the exception of few concerning coprophilous species (Richardson 2008). The study of the macrofungi on these islands was a project initiated in 1998 within the framework of an ongoing inventory of Greek macromycetes in selected areas and habitats of the country (Dimou et al. 2002, Zervakis et al. 2002a, Zervakis et al. 2002b, Zervakis et al. 2004, Dimou et al. 2008, Polemis et al. 2011); most of the data on the mycobiota of Naxos and Amorgos formed part of the Ph.D. dissertation of the first author (Polemis 2010).

**Material and methods**


Field parameters, macroscopic characteristics and some macrochemical reactions of the collected specimens were recorded *in situ*. Following the classical methods, dried samples were examined under a light microscope and phase-contrast mostly at the Agricultural University of Athens, but some specimens were transferred to Copenhagen (Botanical Museum) and Leiden (National Herbarium of the Netherlands) for further study and/or comparison with relevant samples. All sections were mounted and observed in KOH 3%–5%, and — depending on the specimen — in Melzer’s reagent, congo red, cotton blue, sulfovaniline and/or cresyl blue. The nomenclature follows mainly *Index Fungorum* (http://www.indexfungorum.org). The transliteration of the Greek geographical names into English follows the international standard ISO 843 (1999).

**Results**

Genera and species are presented alphabetically. For each specimen, location, habitat and host/substrate, collection date and sample code are given; the initials EP refer to E. Polemis and DD to D. Dimou. First records for Greece are marked with an asterisk (*), and a brief description of their most prominent characteristics is included together with a short discussion of the pertinent literature (if necessary). New habitat or host/substrate records for Greece are marked with a cross (†) placed before the taxon’s name or after the host/substrate if it is reported for the first time.

*Agaricus bisporus* (J.E. Lange) Imbach


*Agaricus bresadolanus* Bohus

**Agaricus campestris** L.


**Agaricus cupreobrunneus** (Jul. Schäff. & Steer) Pilát


**Agaricus langei** (F.H. Møller) F.H. Møller.


**Agaricus litoralis** (Wakef. & A. Pearson) Konrad & Maubl.


### Table 1. Sampling localities on the island of Naxos with their respective numbers, geographic coordinates and altitude (see Fig. 2).

<table>
<thead>
<tr>
<th>Locality</th>
<th>Coordinates</th>
<th>Altitude (m a.s.l.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agia</td>
<td>37°11′06″N, 25°31′17″E</td>
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<tr>
<td>2</td>
<td>Apolonas</td>
<td>37°10′40″N, 25°33′09″E</td>
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<tr>
<td>3</td>
<td>Koronida</td>
<td>37°08′34″N, 25°31′39″E</td>
</tr>
<tr>
<td>4</td>
<td>Skeponi</td>
<td>37°08′13″N, 25°29′57″E</td>
</tr>
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<td>5</td>
<td>Amiti Bay</td>
<td>37°08′09″N, 25°26′05″E</td>
</tr>
<tr>
<td>6</td>
<td>Naxos Town (2 km NW)</td>
<td>37°07′12″N, 25°24′15″E</td>
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<td>7</td>
<td>Keramotis (Sifones)</td>
<td>37°06′04″N, 25°31′15″E</td>
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<td>8</td>
<td>Kynidaros</td>
<td>37°05′58″N, 25°28′47″E</td>
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<td>9</td>
<td>Naxos Town (Alykes)</td>
<td>37°05′11″N, 25°21′59″E</td>
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<td>10</td>
<td>Melanes</td>
<td>37°05′07″N, 25°27′11″E</td>
</tr>
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<td>11</td>
<td>Kato Potamia</td>
<td>37°04′44″N, 25°25′43″E</td>
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<td>12</td>
<td>Chalkeio</td>
<td>37°04′41″N, 25°28′58″E</td>
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<td>13</td>
<td>Apeiranthos (to Moutsouna)</td>
<td>37°04′24″N, 25°31′51″E</td>
</tr>
<tr>
<td>14</td>
<td>Moutsouna</td>
<td>37°04′18″N, 25°35′05″E</td>
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<tr>
<td>15</td>
<td>Apeiranthos</td>
<td>37°04′17″N, 25°31′15″E</td>
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<td>16</td>
<td>Agia Anna</td>
<td>37°03′51″N, 25°21′20″E</td>
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<td>17</td>
<td>Ano Sagkri</td>
<td>37°02′37″N, 25°26′21″E</td>
</tr>
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<td>18</td>
<td>Filoti</td>
<td>37°02′30″N, 25°29′44″E</td>
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<td>19</td>
<td>Marathi beach</td>
<td>37°00′47″N, 25°34′05″E</td>
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<tr>
<td>20</td>
<td>Pyrgakia</td>
<td>36°58′49″N, 25°23′20″E</td>
</tr>
<tr>
<td>21</td>
<td>Irakleia</td>
<td>36°50′20″N, 25°27′16″E</td>
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</tbody>
</table>

### Table 2. Sampling localities on Amorgos with their respective numbers, geographic coordinates and altitudes (see Fig. 3).

<table>
<thead>
<tr>
<th>Locality</th>
<th>Coordinates</th>
<th>Altitude (m a.s.l.)</th>
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<td>1</td>
<td>Agios Theologos Monastery</td>
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<tr>
<td>2</td>
<td>Lagkada (Panagia Epanochoriani)</td>
<td>36°54′47″N, 26°00′21″E</td>
</tr>
<tr>
<td>3</td>
<td>Lagkada (Stroumpos)</td>
<td>36°54′36″N, 26°00′03″E</td>
</tr>
<tr>
<td>4</td>
<td>Aigiali</td>
<td>36°54′35″N, 25°59′09″E</td>
</tr>
<tr>
<td>5</td>
<td>Lagkada (path to Agios Theologos)</td>
<td>36°54′27″N, 26°01′23″E</td>
</tr>
<tr>
<td>6</td>
<td>Lagkada</td>
<td>36°54′14″N, 26°00′04″E</td>
</tr>
<tr>
<td>7</td>
<td>Amorgos Town (Terlakia)</td>
<td>36°50′57″N, 25°53′30″E</td>
</tr>
<tr>
<td>8</td>
<td>Chozoviotissa Monastery to Agios Ioannis</td>
<td>36°50′28″N, 25°55′00″E</td>
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<tr>
<td>9</td>
<td>Amorgos Town (Kato Fylladi Stream)</td>
<td>36°50′13″N, 25°53′29″E</td>
</tr>
<tr>
<td>10</td>
<td>Agia Anna</td>
<td>36°50′04″N, 25°54′57″E</td>
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<td>11</td>
<td>Stavros</td>
<td>36°48′08″N, 25°51′56″E</td>
</tr>
<tr>
<td>12</td>
<td>Kalotaritissa Bay</td>
<td>36°47′37″N, 25°44′36″E</td>
</tr>
<tr>
<td>13</td>
<td>Arkesini</td>
<td>36°47′15″N, 25°48′28″E</td>
</tr>
</tbody>
</table>
†Agaricus moelleri Wasser


Agaricus pampeanus Speg.


†Agaricus porphyrizon P.D. Orton


†Agaricus pseudopratensis (Bohus) Wasser


†Agaricus silvaticus Schaeff.


†Agaricus silvicola (Vittad.) Peck

Naxos: Apeiranthos, 2 km on the way to Moutsouna, on leaf-litter of Quercus coccifera, 29 Nov. 2005, EP.05-N375.

Agaricus xanthodermus Gènev.


Agrocybe cylindracea (DC.) Maire


†Amanita citrina (Schaeff.) Pers.


*Amanita gracilior Bas & Honrubia


Notes: The only basidioma collected possessed numerous clamps in all tissues, and the spores size was 10–13 × 5.5–7.5(8.5) μm. A Mediterranean species that is often confused with A. baudieri; the latter, however, is characterized by the absence of clamps and appearance of basidiomata in spring (Neville & Poumarat 2004).

†Amanita ovoidea (Bull.) Link


*Amanita proxima Dumée


Notes: It is a Mediterranean species of the section Amidella, related to A. ovoidea, from which it differs by its orange-reddish rooting volva and the persisting membranous ring.

Armillaria mellea (Vahl) P. Kumm.


†Bolbitius titubans (Bull.) Fr.

Boletus aereus Bull.

**Naxos:** Chalkeio, under *Quercus pubescens*, 11 Oct. 2005, EP.05-N311.

Boletus impolitus Fr.


†Boletus lupinus Fr.


Boletus luridus Schaeff.


Boletus pulverulentus Opat.


†Boletus queletii Schulzer


†Boletus radicans Pers.


†Bovista plumbea Pers.

**Amorgos:** Aigiali, on soil under *Olea europaea*, 6 Jan. 2005, EP.05-M107.

*Clavaria fragilis* Holmsk.

**Naxos:** Koronida, on wet soil under *Acer sempervirens*, 13 Jan. 1999, EP.99-N066.

Notes: Basidiomata up to 8.5 × 0.7 cm, very fragile, vermiform, cylindrical, clavate to fusiform and sometimes compressed, white, with yellowish to brown apices; spores 4.5–7 × 3–5(–6) µm, ellipsoid-ovoid; basidia clampless. Differentiating characters of this taxon are the non-branching basidiomata, the size of spores and the absence of clamps at the basidia (Jülich 1984). This taxon is previously referred in Greece as *C. vermicularis* from western Macedonia (Constantinidis 2006); however, since no pertinent herbarium specimen was available for examination/confirmation (G. Constantinidis pers. comm.), we consider our finding as the first record of this species.

*Clitocybe candicans* (Pers.) P. Kumm.

**Naxos:** Ano Sagkri, on needle litter, under *Pinus halepensis*, 3 Dec. 1998, EP.98-N034.

Notes: Our samples consisted of basidiomata with pileus diameter of 1.5–2 cm, spores not in tetrads, measuring (4–)4.5–6.5(–7) × 2.5–3(–3.5) µm. The closely-related taxon *C. rivulosa* has larger basidiomata, wider spores (sometimes up to 25%) arranged in tetrads (Kuyper in Bas et al. 1995).

†Clitocybe costata Kühner & Romagn.

**Naxos:** Path from Lagkada to Agios Theologos Monastery, on leaf-litter of *Quercus cocccifera*, 18 Dec. 2004, EP.04-M030.

†Clitocybe odora (Bull.) P. Kumm.

**Amorgos:** Path from Chozoviotissa Monastery to Agios Ioannis, on manured soil among *Sarcopoterium spinosum*, 29 Nov. 2005, EP.05-N372.

†Clitocybe rivulosa (Pers.) P. Kumm.


†Clitopilus hobsonii (Berk. & Broome) P.D. Orton

**Naxos:** Apeiranthos, 2 km on the road to Moutsouna, on *Quercus cocccifera*, 29 Nov. 2005, EP.05-N372.

†Clitopilus prunulus (Scop.) P. Kumm.

**Naxos:** Koronida, on leaf litter of *Quercus cocccifera* and *Q. pubescens*, 12 Oct. 2005, EP.05-N325.

†Conocybe rickenii (Jul. Schäff.) Kühner

**Amorgos:** Path from Chozoviotissa Monastery to Agios Ioannis, on manured soil among *Sarcopoterium spinosum*,

**Conocybe semiglobata** (Kühner) Kühner & Watl.


†**Coprinus disseminatus** (Pers.) J.E. Lange


†**Coprinus radians** (Desm.) Vilgalys, Hopple & Jacq. Johnson

Amorgos: Arkesini, on woody residues of *Pistacia lentiscus* and *Ceratonia siliqua*, 4 Jan. 2005, EP.05-M070; Amorgos Town (Kato Fylladi Stream), on woody residues of *Olea europaea* and other shrubs, 2 Dec. 2005, EP.05-M165.

**Coprinellus xanthothrix** (Romagn.) Vilgalys, Hopple & Jacq. Johnson


**Coprinellus disseminatus** (Pers.) J.E. Lange, Hopple & Jacq. Johnson

*Notes*: Easily distinguished from the related species *C. comatus* and *C. vosoustii*, due to its very large spores, measuring in our samples 16–24 × 8.5–14 μm.

**Coprinus vosoustii** Pilát


*†Cortinarius caligatus* Malençon


*Notes*: Species known from the west Mediterranean countries in sclerophyllous *Quercus* spp. forests. Basidiomata medium to large; pileus 5.5–11.0 (13.0) cm, without conspicuous veil remnants; lamellae bright bluish-lilac when young; stipe 8–10 (13) × 1.5–3 (5) cm, fusiform, attenuate towards the base, with prominent veil-zones, cortina white; context white not reacting with KOH; spores 8–11 (15.5) × 5–6.5 (7) μm, amygdaliform, moderately verrucose. Veil remnants on pileus appearing as appressed scales were not clearly evident in our specimens, reminiscing thus the closely related species *C. variiformis*, which however has smaller basidiomata, not so brightly coloured lamellae, and clavate stipe, with indistinct veil-zones (Brandrud et al. 1998).

**Cortinarius diasemospermus** Lamoure


*Notes*: Pileus up to 2 cm, convex with low umbo or conical acutely umbonate, hygrophanous, purple-date to fawn when dry, surface silky, pubescent; young lamellae milky-coffee to fawn; stipe cylindrical, 4–6 × 0.4–0.7 cm, white, to greyish-beige at top, girdled with white bands at base, veil abundant, white; context brownish; spores 8–10 (11) × 5–6 (6.5) μm, with indistinct veil-zones. The small size of basidiomata, the sweet odour of *Quercus* spp. forests. Basidiomata, not so brightly coloured lamellae, and clavate stipe, with indistinct veil-zones (Brandrud et al. 1998).

**Cortinarius humolens** Brandrud


*Notes*: Pileus 8–12 cm, ochre, yellow, sulphur yellow, beige at places, or with rust spots, reddish-brown with KOH; lamellae young yellowish; stipe 8–12 × 1–2.5 cm, with mariginate bulb up to 4.5 cm; flesh whitish, smell faint, not reacting with KOH; spores (10)–10.5–13 (–13.5) × 6–7 (–7.5) μm, amygdaliform to almost limoniform, coarsely verrucose.
The negative reaction of flesh with KOH, as well as the almost limoniform coarsely verrucose spores are the main diagnostic features of this taxon; however, the yellowish cortina was not observed in our specimens as well as the earthy smell mentioned in previous studies (Branbdud et al. 1998, Consiglio et al. 2004).

**Cortinarius infractus** (Pers.) Fr.


**Crepidothus calolepis** (Fr.) P. Karst.


†**Crepidothus epibryus** (Fr.) Quél.


**Crepidothus variabilis** (Pers.) P. Kumm.

**Amorgos**: Lagkada (Stroumpos), on *Quercus coccifera*, 5 Dec. 2005, EP.05-M213.

†**Crinipellis scabella** (Alb. & Schwein.) Murrill


**Cyathus olla** (Batsch) Pers.

**Naxos**: Apeiranthos, on soil and rotting organic matter, 4 Dec. 1998, EP.98-N056.

**Entoloma griseopruinatum** Noordel. & Cheype

**Amorgos**: Agios Theologos Monastery, on soil among scrubs, 4 Dec. 2005, EP.05-M199.

Notes: This is the only known record in Greece of this rare Mediterranean species previously recorded in south France and Spain (Noordeloos & Polemis 2008).

**Entoloma griseorugulosum** Noordel. & Fern. Sas.


Notes: This is the only known record in Greece of this rare Mediterranean species previously known only from the type locality in Spain (Noordeloos & Polemis 2008).

†**Entoloma hirtipes** (Schum.) M.M. Moser


*Galera* (Velen.) Kühner

**Naxos**: Lagkada (Stroumpos), on moss under *Quercus coccifera*, 17 Dec. 2004, EP.04-M003.

Notes: Species belonging to the subgenus *Tabariocystis* Smith Singer; it is characterized by the total absence of clamps and calyptra on spores, and by the presence of tibiform cystidia in lamellar edges, pileipellis and stipitipellis (Gulden et al. 2005). Spores of our sample measured (7–)8–10.5(–12–14) × 4–5.5 µm, cheilocystidia 20–40 × 5–10 µm, with capitulum up to 5 µm broad, pileo- and caulocystidia similar, with larger capitulo up to 9 µm broad.

†**Gymnopus brassicolen* (Romagn.) Antonín & Noordel.


†**Gymnopus dryophilus** (Bull.) Murrill


†**Gymnopus quercophilus** (Pouzar) Antonín & Noordel.

†Hebeloma crustuliniforme (Bull.) Quél.


†Hemimycena lactea (Pers.) Singer


†Hygrocybe mucronella (Fr.) P. Karst.


†Hygrocybe virginiana (Wulfen) P.D. Orton & Watling


†Hygrocybe discocyanus Rea


†Inocybe bongardii (Weinm.) Quél.


†Inocybe flocculosa (Berk.) Sacc.


†Inocybe hirtella (Berk.) Bres.


†Laccaria laccata (Scop.) Berk. & Broome


Leccinum lepidum (Bouchet ex Essette)

Naxos: Apeiranthos, 2 km on the road to Moutsouna, under Quercus coccifera, 12 Jan. 2005, EP.05-N301.

†Lentinellus flabelliformis (Bolton) S. Ito

Naxos: Apeiranthos, on unidentified wood (Cistus sp. or Quercus coccifera), 3 Dec. 1998, EP.98-N054.

†Leptota clypeolaria (Bull.) P. Kumm.


†Leptota nuda (Bull.) Cooke


†Leptota panaeolus (Fr.) P. Karst.


†Lepista rickenii Singer


†Lepista sordida (Fr.) Singer

Naxos: Apeiranthos, 2 km on the road to Moutsouna, under Quercus coccifera, 12 Jan. 2005, EP.05-N301.

†Leratiomyces squamosus (Pers.) Bridge & Spooner var. squamosus

Naxos: Apeiranthos, on leaf litter of Quercus coccifera, 1 Dec. 1998 and 29 Nov. 2005, EP.98-N005 and EP.05-N367, respectively.

†Leratiomyces squamosus (Schulzer) Bridge & Spooner var. thraustus

Naxos: Apeiranthos, on needles under Pinus halepensis, 3...

*Leucoagaricus crystallifer* Vellinga


**Notes**: Pileus 3–4 cm, conical then to almost plane, ochre-beige at disc, whitish-towards the margin, silky fibrilllose; lamellae white; stipe 5–7 × 0.5–0.6 cm, clavate to almost bulbous (base up to 0.8 cm) white, annulus ascending white; spores (5.5–)6–10(–11) × 3.5–4.5(–5) µm, ellipsoid-subamylodiform, oblong, often with apical papilla, dextrinoid, metachromatic in cresyl blue; cheilocystidia 22–45 × 6–12 µm, cylindrical-fusiform, narrowly clavate or almost utriform; with crystals at apices; pileus covering a cutis made of cylindrical elements 4–9 µm broad. It is closely related to *L. serenus*, which possesses broadly clavate cheilocystidia without crystals (Noordeloos et al. 2001).

*Leucoagaricus menieri* (Sacc.) Singer.


**Notes**: Pileus 3–4 cm, white to brown squamosus at centre; stipe 2–4 × 0.6 cm (–0.8 at base), cylindrical with emarginately bulbous base, with white rhizomorphs; context white not changing when cut, with sweet odour; spores (5–)5.5–8(–9) µm, slenderly fusiform, with prominent apiculus, conical apex, without germ-pore; cheilocystidia 16–45 × 6–13 µm, fusiform, lageniform, slenderly clavate, often papillate. This taxon is distinguished from *cystidia* 16–45 × 6–12 µm, cylindrical-fusiform, narrowly clavate or almost utriform; with crystals at apices; pileus covering a cutis made of cylindrical elements 4–9 µm broad. It is closely related to *L. serenus*, which possesses broadly clavate cheilocystidia without crystals (Noordeloos et al. 2001).

Lycoperdon lividum Pers.


Lycoperdon perlatum Pers.

**Naxos**: Apeiranthos, 2 km on the road to Moutsouna, on leaf-litter of *Quercus coccifera*, 29 Nov. 2005, EP.05-N371.

Lycoperdon pratense Pers.


*Lyophyllum eustygium* (Cooke) Clémençon

**Naxos**: Apeiranthos, 2 km on the road to Moutsouna, on leaf-litter of *Quercus coccifera*, 12 Jan. 2005, EP.05-N295.

**Notes**: Pileus 2.5–3.5 cm, greyish-brown at centre to greyish at margin, innately fibrous to squamulose; lamellae whitish, brown when bruised; stipe 3.5–4.5 × 0.6–0.9, cylindrical, white; context white greyish black when cut, with strong mealy smell; spores 5.5–7 × 5.5–(6) µm, globose to subglobose. The color change of lamellae and context, in addition to the almost globose spores are the characteristic features of this taxon (Clémençon 1982, Moser 1983).

†Macrocystidia cucumis* (Pers.) Joss.

**Amorgos** Town (Kato Fylladi stream), on soil under *Ballota acetabulosa*, 8 Jan. 2005, EP.05-M128.

**Macrolepiota excoriata** (Schaeff.) Wasser


†Macrolepiota fuligineosquarrosa Malençon

**Naxos**: Kyndaros, on sandy soil, gregarious, 28 Nov. 2005, EP.05-N348.

**Notes**: Pileus 7–9 cm, cylindrical to trapezoidal, then convex to plane, initially smooth velvety, blackish-brown, soon with large uplifted scales (as in *M. proceræ* (Scop.) Singer); stipe 7–12 × 1–1.5 cm (up to 3 cm at base), greyish-brown, fibrous, annulus simple, greyish-brown underneath; context white unchangeable; spores 11–14.5 × 8–10(–10.5) µm, cheilocystidia in chains, with clavate terminal elements 15–25 × 5–15 µm, pileipellis consisting of cylindrical hyphae in chains, with terminal elements up to 70 × 5–11 µm, often capitulate, thick-walled, with intracellular and incrusting pigment; clamps not observed in any part of the basidiomata. A unique Mediterranean taxon reminiscing a small sized *M. proceræ*, without the typical “adder pattern” on stipe. In the original description of Malençon (1979), clamps are reported to exist; however, this is in contrast to what was later reported by Canduzo and Lanzoni (1990).

†Macrolepiota mastoidea (Fr.) Singer

**Naxos**: Apeiranthos, 2 km on the road to Moutsouna, on leaf-litter of *Quercus coccifera*, 11 Jan. 2005, EP.05-N278.

†Macrolepiota phaeodisca Bellú


**Notes**: This Mediterranean taxon was first recorded in Greece from Naxos island, but soon after it was found...
to be very common in Andros, as well as in several other Aegean islands and coastal areas. Typical of this taxon is the trapezoidal pilei of young basidiomata, with a dark greyish brown disc in the pileus central part. Spores in our samples measured (11–)12–20(–22) × 8–11(–12) µm and they are significantly larger when compared with those described by Canduzo and Lanzoni (1990).

**Macrolepiota procera** (Scop.) Singer


†*Marasmius anomalus* (Maire) Antonín var. microsporus


†*Marasmius wynneae* Berk & Br.


*Melanoleuca albifolia* Boekhout


Notes: Basidiomata small-sized; pileus 3.5–6 cm, hygrophanous, dark sepia, to almost black at centre when wet, lighter brown to beige when dry; lamellae greyish-white; stipe 4–6 × 0.4–1 cm, concolorous with pileus, striate and apicaly pruinose; spores (6.5–)7–9(–9.5) × 4–5.5(–6) µm; cheliozystidia abundant, lageniform to fusiform 35–65 × 8–15(–18) µm, pleurozystidia similar, scarce. The darker colours of basidiomata and the mostly lageniform cystidia, are the main diagnostic features of this taxon (Bas et al. 1999).

†*Melanoleuca brevipes* (Bull.) Pat.


†*Melanoleuca excissa* (Fr.) Singer.


†*Melanoleuca grammopodia* (Bull.) Pat.


†*Melanoleuca iris* Kühner


†*Mycese arcangeliana* Bres.


†*Mycese niveipes* (Murrill) Murrill


*Mycese seynesii* Quél.


†*Mycese zephrus* (Fr.) P. Kumm.


†*Panaelina foenisecii* (Pers.) Maire

†Panaeolus acuminatus (Schaeff.) Quél.

Naxos: Apeiranthos, 2 km on the road to Moutsouna, on manured soil under Quercus coccifera, 29 Nov. 2005, EP.05-N368.

*Panaeolus cinctulus (Bolton) Sacc.


Notes: Pileus 1–2 cm, conical to hemispherical, hygrophanous, dark brown when wet, yellowish-brown and concentrically zonate on drying; stipe 1–5 × 0.1–0.4 cm, cylindrical, yellowish-brown, pruinose at apex; spores (11–)11.5–15(–17) × (5.5–)6–8.5 × 8–9.5(–10) µm, citriform in face-view, ellipsoid in side-view, dark-brown, thick-walled and with large germ-pore (up to 3 µm); cheilocystidia 26–45 × 6–11 µm, fusiform-lageniform, often with capitate apex up to 7 µm broad; pleurochrysocystidia absent. Panaeolus cinctulus is characterized by the absence of pleurochrysocystidia and by the shape of its cheilocystidia (Gerhardt 1996).

Panaeolus papilionaceus (Bull.) Quél.


†Parasola leiocephala (P.D. Orton) Redhead, Vilgalys & Hopple

Naxos: Apeiranthos, 2 km on the road to Moutsouna, on leaf-litter of Quercus coccifera, 29 Nov. 2005, EP.05-N370.

Parasola schroeteri (P. Karst.) Redhead, Vilgalys & Hopple


†Phaeomarasmius erinaceus (Pers.) Scherff. ex Romagn.


†Pholiota highlandensis (Peck) A.H. Sm. & Hesler


Pleurotus eryngii (DC.) Quél.


Pleurotus eryngii var. ferulae (Lanzi) A.H. Sm. & Hesler


†Pluteus nanus (Pers.) P. Kumm.


†Pluteus phlebophorus (Ditmar) P. Kumm.


†Psathyrella bipellis (Quél.) A.H. Sm.


†Psathyrella candolleana (Fr.) Maire

Amorgos: Amorgos Town (Kato Fylladi stream), on soil and plant residues under Ceratonia siliqua, 2 Dec. 2005, EP.05-M159.

Psathyrella conopilus (Fr.) A. Pearson & Dennis


†Psathyrella lutensis (Romagn.) M.M. Moser

Psathyrella marcescibilis (Britz.) Romagn.


Psathyrella microrhiza (Lasch) Konr. & Maubl.


Psathyrella prona (Fr.) Gill.


Psathyrella tephrophylla (Romagn.) Bon


Psilocybe coprophila (Bull.) P. Kumm.


Psilocybe subcoprophila (Britz.) Sacc.

Amorgos: Amorgos Town (Kato Fylladi stream), on donkey excrements, 8 Jan. 2005, EP.05-M127.

Notes: This taxon is identical to P. coprophila with the only exception of the very large ellipsoid spores (Bas et al. 1999) measuring in our specimens 13–19 × 7–9 µm.

Resupinatus applicatus (Batsch) Gray


Rhodocybe gemina (Fr.) Kuyper & Noordel.


Simocybe haustellaris (Fr.) Watling


Notes: Basidiomata small; pileus 2–10 mm, greyish-brown, pubescent; lamellae beige to brown in maturity; stipe rudimentary; spores (7–)7.5–11(–12) × 5–6(–7) µm, ellipsoid to kidney-shaped, thick-walled, with a small germ-pore; basidia 2-spored. The small size of basidiomata, the 2-spored basidia and the thick-walled spores with a more or less evident pore are the main diagnostic features of this taxon (Watling 1989).

Stropharia coronilla (Bull.) Quél.


Stropharia luteonitens (Fr.) Quél.

Naxos: Kynidaros, on old dung, 28 Nov. 2005, EP.05-N351.

Notes: Pileus 0.4–1 cm, conical-hemispherical, then convex to almost plane with a small papilla, hygrophanous, cinnamon at disc to ochre towards the margin, lubricous, viscid when wet; stipe 2.0–6.5 × 0.1–0.2 cm, cylindrical, ochre-beige, faintly striate, pruinose above the indistinct annular zone and floccose below; spores (16–)17–20.5(–23) × (9–)10–12(–13) µm, ellipsoid, with walls up to 2 µm thick, with large central germ-pore; basidia 2-spored, cheilocystidia 20–40 × 5–12 µm, lageniform or cylindrical slightly enlarged at apex; pleurocystidia absent; closely related to S. semiglobata from which it differs in the shape of pileus and the 2-spored basidia (Bas et al. 1999).

Suillus collinitus (Fr.) Kuntze


Tricholoma sculpturatum (Fr.) Quél.

Naxos: Apeiranthos, 2 km on the road to Moutsouna, under Quercus coccifera, 12 Jan. 2005, EP.05-N299.

Tricholoma stiparophyllum Fr. & N. Lund

Naxos: Apeiranthos, 2 km on the road to Moutsouna, under Quercus coccifera, 29 Nov. 2005, EP.05-N377.

Tubaria dispersa (L.) Singer.


Notes: Our samples possessed the typical yellow lamellae of this species, but spores were found somewhat wider than in pertinent descriptions (Hansen & Knudsen 1992, Moser 1983), measuring 5–7.5(–8) × 3–4.5(–5) µm. The
habit for this collection is also noteworthy, since this species commonly grows in association with *Crataegus* spp.

**Tubaria furfuracea** (Pers.) Gillet


**Volvariella gloiocephala** (DC.) Boekhout & Enderle


**Xerocomus chrysenteron** (Bull.) Quél.


**Xerocomus ichnusanus** Alessio, Galli R. & Littini


**Notes**: Two additional reports exist from mainland Greece (Constantidis 2009); however, since no pertinent herbarium specimen was available for examination/confirmation (G. Constantidis pers. comm.), we consider our finding as the first record of this species. Basidiomata caespitose; pileus 3.5–10 cm, brownish to beige, often with an olivaceous tint; pores lemon-yellow to olivaceous brown, bluing on bruising; stipe 3–9 × 0.8–2.5 cm attenuating towards the base, rooting, yellow at apex with brownish reticulum or striae towards the base, which is uniformly reddish-brown; context pale yellow at pileus, reddish below cuticle, bluing when cut and soon blackening; macrochemical reactions: dark yellow with H₂SO₄ and orange with KOH; spores 12–17.5(–20) × 5–6.5(–7) μm; pileipellis an intricate trichoderm with cylindrical terminal elements 4–12 μm in diameter. The caespitose habit, reticulate stipe surface and rooting base make this taxon easily identifiable (Ladurner & Simonini 2003).

**Xerocomus roseealbidus** Alessio & Littini


**Xerocomus subtomentosus** (L.) Quél.


**Summary**

In this survey, 58 genera and 142 taxa of macrofungi belonging to the subclass Agaricomycetidae were recorded. The genus *Simocybe* as well as 21 taxa at the species or subspecies level constitute new records for Greece, while 76 taxa represent first national reports for habitat, hosts and/or substrates. Apart from the taxa listed above, the coprophilous basidiomycetes *Coprinellus heptemerus*, *Coprinopsis filamentifer*, *C. vermiculifer* and *Coprinus ephemeroides* were previously reported to occur on Naxos (Richardson 2008).

A significantly large number of these new records are taxa with a more or less typical Mediterranean geographic distribution known to date mainly from the west Mediterranean countries (e.g. *Amanita gracilior*, *A. proxima*, *Macrolepiota fuligineosquarosa*). In some cases, these taxa have been reported only from the type locality or from few localities (e.g. *Mycena bertaultiana*). This is especially evident with macrofungi that form ectomycorrhizal symbioses with evergreen sclerophyllous *Quercus* spp.; many species that were previously reported from *Q. ilex* woods in west Mediterranean only, occur also on Naxos and Amorgos islands, growing in association with *Q. coccifera* (e.g. *Cortinarius caligatus*, *Xerocomus ichnusanus*).

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