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Two new *Gymnopus* species from the Island of Andros (Kiklades, C. Aegean, Greece)

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Abstract — Two new species of *Gymnopus* from the island of Andros (Kiklades, C. Aegean, Greece) are described and discussed. *Gymnopus dysosmus* is a uniformly coloured dark brown species with unpleasant garlic smell, similar to that of *G. impudicus* but differing by the dark basidiocarps, long and slender, almost cylindrical spores and a greenish brown reaction of the pileipellis hyphae with alkali. *Gymnopus amygdalisporus* shows also a similar but clearer green reaction with alkali, especially of the trama hyphae and it is therefore placed in the sect. *Levipedes* subsect. *Alcalivirentes* where it takes a unique position with its dark date-brown to olivaceous pileus, yellowish-brown distant lamellae and broadly ellipsoid to amygdaliform spores.

Key words — *Omphalotaceae*

Introduction

Reports on the macrofungi from the islands of the Aegean archipelagos are scarce in literature (Pettrak 1943a,b; Plank 1980). In the frame of the inventory of the Greek macrofungi, the islands of Andros, Naxos and Amorgos (Kiklades, Central Aegean, Greece) have been thoroughly investigated. Andros has been visited periodically by P. Lizoň (1993-1997); furthermore from 1995 until recently, it is being inventoried almost yearly, mainly from September to March, by E. Polemis. Some preliminary results of this work, including several records new for Greece, were presented in national check-lists (Zervakis et al. 1998, 1999) and during scientific conferences (Polemis et al. 2002). Among other interesting species, two collections belonging to *Gymnopus* from Andros

— the first from an abandoned field with *Pteridium aquilinum* and the second in littoral alluvial grassland — are found to be new species. They are illustrated and described below.

Material and methods

The material was collected and photographed in the field by the first author during his visits to Andros in 2004. Extensive notes were made from the fresh material. Microscopical analyses were performed using a Leica DM 1000 microscope using standard techniques. Drawings were made with help of a drawing tube.

Taxonomy

Although the genus *Gymnopus* in Europe is fairly well known due to the work of Antonín & Noordeloos (1997), a number of new taxa have recently been described, mainly from the Mediterranean (Bañares et al. 2007, Contu 2000, Ortega et al. 2003, Villareal et al. 2002). At present 41 species are known from Europe, including the following two new taxa from Andros. Both new species fit well within the core of the genus *Gymnopus* as circumscribed in a phylogenetic context by Mata et al. (2007)

Gymnopus dysosmus Polemis & Noordel., sp. nov.

Fig. 1.

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Pileus 10-30 mm, hemisphericus vel convexus, depressus, hygrophanus, haud translucido-striatus, obscure brunneus, pallescens, glaber; lamellae subdistantes, adnatae, ventricosae, crassae, obscure griseobrunneae; stipes 30-50 × 3-4 mm, pileo concolor, pruinosis, glabrescens; odor saporeque foetens. Sporae (7.5)8.0-11(12) × (3.0)3.3-4.5 μm, oblongae, lacrymoideae vel cylindraceae, Q = 2.0-2.9, inamyloideae; basidia tetrasporigera, fibulata; acies lamellarum heterogenea; cheilocystidia 20-30 × 4-8 μm, clavata vel fusiformia, inconspicua; pileipellis cutis hyphis cylindraceis 3-13 μm latis constitutus pigmentis incrustatis; caulocystidia 16-38 × 4-8 μm, cylindracea vel flexuosa, interdum coralloidea, incrustata; fibulae presentes. Habitat inter *Pteridium* locis ruderalis. Holotypus: "Greece, Kiklades (C. Aegean), Isl. Andros, Valley of Vori stream, 2km from the shore, 1 Dec. 2004, E. Polemis 04-A805 (L)

Etymology—*dys* = bad, *osme* = smell, referring to the fetid smell.

Description—Basidiomata medium sized, fasciculate, uniformly colored dark (grey-) brown, with a strong fetid-garlic smell. Pileus 10- 30 mm, hemispherical to convex, with distinct central depression, with slightly inflexed and soon deflexed to straight and undulating margin, hygrophanous, when moist dark date-brown, not or faintly striate at margin, somewhat sulcate, smooth, matt when dry, pallescent on drying to pinkish or ochraceous grey-brown, fawn, at centre remaining darker for a long time. Lamellae subdistant to moderately crowded, L=26-34, l=1-3, narrowly adnate and often forked near to attachment

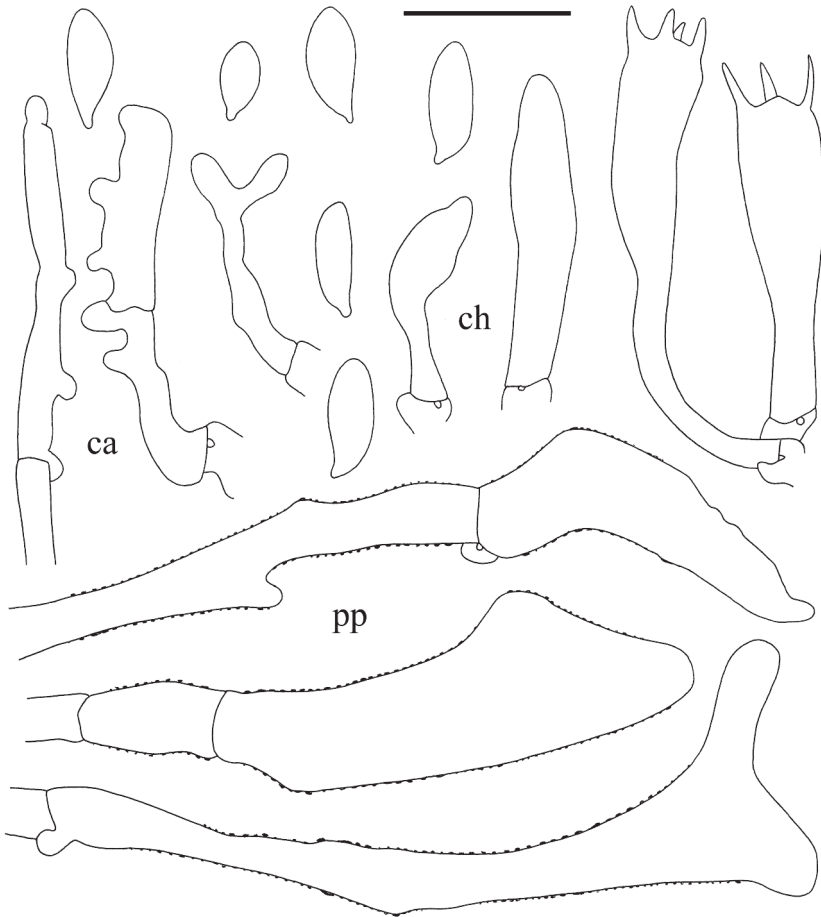


Fig.1. *Gymnopus dysosmus*. Spores, cheilocystidia (ch), basidia, caulocystidia (ca), and pileipellis (pp) [from holotype]. Bar = 20 μ m.

to stipe, ventricose and rather thick, dark greyish-brown, almost concolorous with pileus, slightly paler towards edge, pallescent on drying. Stipe 30-50 \times 3-4 mm, cylindrical to somewhat compressed, uniformly dark brown, concolorous with pileus, initially almost entirely white pruinose then almost smooth and glabrous to slightly fibrillose, with abundant white rhizoids at base. Context thin in pileus, dark brown to pinkish brown, thin and concolorous with surface in stipe. Smell and taste strong, unpleasant fetid or like garlic.

Basidiospores (n=30) (7.5)8.0-11(12) \times (3.0)3.3-4.5 μ m, Q = 2-2.9 Qav = 2.4, oblong, lacrymoid to cylindrical, hyaline, smooth, thin-walled, inamyloid.

Basidia 26-36(42) × 6-8.5(9) μm, 4-spored, clavate, clamped. Lamella edge heterogeneous. Cheilocystidia 20-30 × 4-8 μm, clavate-fusiform, to cylindrical, not branched, inconspicuous. Pleurocystidia absent. Hymenophoral trama subregular made up of cylindrical, thick-walled, moderately branched 2.5-10 μm wide hyphae, greenish-brown in KOH, with coarsely incrusting pigment. Subhymenial hyphae thin-walled, hyaline, often irregularly gnarled-coralloid. Pileipellis a cutis of cylindrical, radially arranged, 3-13 μm wide hyphae, with slightly thickened, brownish walls, with fine to coarse incrustations in distinct bands, with short lateral projections; terminal elements fusoid, often irregular to lobate, up to 20 μm broad. Stipitipellis a cutis made up of cylindrical, slightly thick-walled smooth or incrustated yellow-brown, 2-6 μm wide, hyphae. Caulocystidia 16-38 × 4-8 μm, smooth to finely incrustated, cylindrical to flexuous, often lobate or branched to somewhat coralloid, hyaline. Clamp connections abundant in all tissues. Pileus surface of exsiccates turning black with KOH, greenish-brown under microscope in KOH. No part of basidiomata amyloid, dextrinoid, or metachromatic in cresyl blue.

Habitat: Gregarious in an abandoned field on wet mossy soil with residues of *Pteridium aquilinum* and twigs of unidentified shrubs.

Collection examined. Greece, Kiklades (C. Aegean), Isl. Andros, Valley of Vori stream, 2km from the shore, 1 Dec. 2004, E. Polemis 04-A805 (holotype L, isotype LGAM-AUA).

Gymnopus dysosmus keys out in section *Vestipedes* Antonín, Halling & Noordel. on account of the pileipellis structure of repent, not inflated, hardly diverticulate hyphae, and in subsect. *Impudicae* Antonín & Noordel. because of the strong fetid smell (Antonín & Noordeloos 1997, 2008). It differs from all the known European species by the long, narrow spores. The otherwise similar *G. impudicus* (Fr.) Antonín, Halling & Noordel. usually has less dark basidiocarps, well differentiated cheilocystidia and spores measuring (5.5)6.5–9.0(9.5) × (2.9)3.2–4.5 μm, with Q value between 1.7 and 2.2. *Gymnopus herinkii* Antonín & Noordel. has much paler colours, spores 6.5–9.0(9.5) × 3.5–4.5 μm, Q = (1.6)1.7–2.1, and a completely fertile lamella edge without cystidia. None of the North American species described by Halling (1983) fits with the present species.

***Gymnopus amygdalisporus* Polemis & Noordel., spec. nov.**

Fig.2.

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Pileus 10-40(-50) mm, hemisphericus vel convexus demum expansus, obtuse umbonatus, haud hygrophanus, haud translucido-striatus, obscure rufobrunneus vel sepiaceus, margine versus olivaceo tincto, initio pruinosis demum glabrescens, innate fibrillosus; lamellae distantes, adnatae, anastomosae vel furcatae, brunneae; stipes 30-50 × 3-10(-20), cylindricus vel compressus, argillaceo-brunneus, fibrillosus vel leviter rimosus; odor saporque adstringens. Sporae (7.0)8.0-9.5(11.4) × (4.2)4.7-6.0(6.5) μm, amygdaliformiae,

inamyloideae; basidia tetrasporigera; acies lamellarum heterogenea; cheilocystidia 17-50 × 3.0-9.5 μm, cylindracea, flexuosa vel irregulariter clavata, interdum coralloidea; pileipellis cutis hyphis cylindraceis, 2-20 μm latis, elementis terminalibus cylindraceis, clavatis vel fusiformibus, ad 70 × 12 μm, pigmentis incrustatis; fibulae presentes. Habitat inter Juncus in pratis stercoratis Holotypus: "Greece, Isl. Andros, Kiklades (C. Aegean), Vori beach, 1 Dec. 2004, E. Polemis 04-A796 (L)"

Etymology: *amygdalus* – almond, referring to the almond shaped spores.

Basidiomata fasciculate, medium sized, tricholomatoid, thick-fleshed. Pileus 10-40(50) mm, hemispherical, convex to plano-convex with low, blunt umbo, slightly involute or straight and finally irregularly undulate margin, not hygrophanous, not translucent striate, dark chestnut brown, purplish date-brown to sepia, somewhat paler with olivaceous tinge at margin, initially finely pruinose, glabrescent, then smooth and glabrous or faintly and indistinctly innately fibrillose. Lamellae rather distant L=20-30, l=1-3, adnate, ventricose, moderately thick, often anastomosing, forked and veined, brownish, umber gradually pallescent towards the edge to buff-ochraceous. Stipe 30-50 × 3-10(15-20) mm, irregularly cylindrical to compressed, slightly tapering downwards or rooting, buff to clay-buff, entirely fibrillose to somewhat rimose. Context relatively thick, ochraceous, cream in stipe to grayish-brown in pileus, reddish-brown under the pileus and stipe cuticle. Smell and taste unpleasant rancid.

Basidiospores (n=30) (7.0)8.0-9.5(11.4) × (4.2)4.7-6.0(6.5) μm, Q = 1.4-2.0, Qav. = 1.6, amygdaliform, ellipsoid, often with large refracting drop, yellowish in KOH, smooth, thin-walled, inamyloid. Basidia 30-40 × 7-10 μm, mostly 4-spored but few 2-spored also seen, clavate, clamped, often with necropigment, which appears yellow-brown in KOH and reddish-brown in ammonia. Lamella edge heterogeneous. Cheilocystidia 17-50 × 3-9.5 μm, cylindrical, flexuose to irregularly clavate, rarely branched to somewhat gnarled or coralloid. Hymenophoral trama regular, made up of hyaline cylindrical elements, 40-110 × 2-10 μm. Pileipellis a cutis made up of 2-20 μm wide, cylindrical hyphae, with cylindrical, clavate to fusiform terminal elements up to 70 × 12 μm, pigment membranal reddish-brown in KOH and coarsely incrusting forming a zigzag pattern, hyaline smooth, gnarled hyphae also present. Tramal hyphae distinctly blue-green with KOH. Stipitipellis a cutis made up of cylindrical up to 7 μm wide, hyphae, thin- to slightly thick-walled, smooth or finely incrusting reddish-brown in KOH. Clamp connections abundant in hymenium but rare or absent in all other tissues. No part of basidiomata amyloid, dextrinoid, or metachromatic in cresyl blue.

Habitat: Gregarious, on soil and on litter in littoral grassy pastures with *Juncus acutus*, on manured soil.

Collection examined. Greece, Isl. Andros, Kiklades (C. Aegean), Vori beach, 1 Dec. 2004, E. Polemis 04-A796 (Holotypus, L, isotype LGAM-AUA).

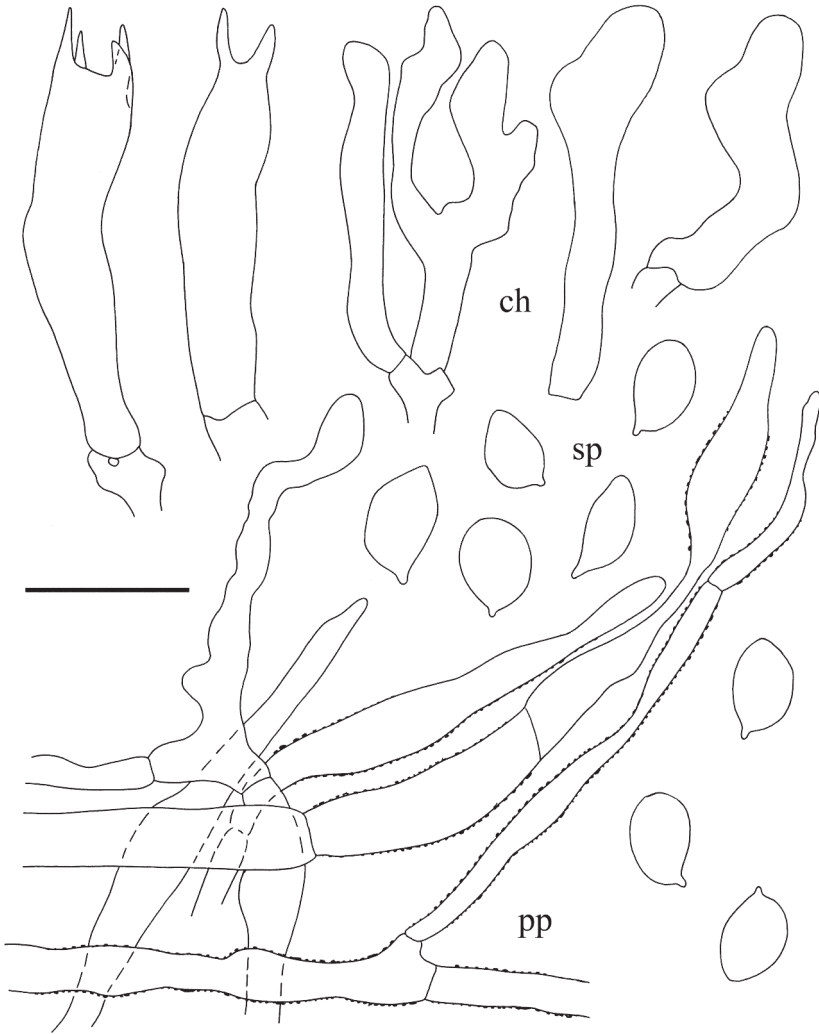


Fig. 2. *Gymnopus amygdalisporus*. Spores, basidia, cheilocystidia (ch) and pileipellis (pp) [from holotype]. Bar = 20 μ m.

Gymnopus amygdalisporus shows a distinct green discoloration of the tramal hyphae in KOH, which places it in sect. *Levipedes* subsect. *Alcalivirentes* Antonín & Noordel. (Antonín & Noordeloos 1997). A number of new species has recently been described from the Mediterranean. *Gymnopus potassiovirescens* Contu is similar but differs by having a less fibrillose stipe, narrower spores, and lacks

coralloid hyphae in the pileipellis (Contu 2000). *Gymnopus bisporus* (J. Carbó & Pérez-De-Greg.) Vila & Llimona from Catalonia is a much smaller species with practically glabrous stipe, 2-spored basidia, and without cheilocystidia (Vila & Llimona 2006). *G. inusitatus* (Vila & Llimona) Vila & Llimona, also described from Spain, has a glabrous stipe, much more slender spores and lacks cheilocystidia (Vila & Llimona 2006).

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