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New and interesting Laboulbeniales (Fungi, Ascomycotina) from Spain

by

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With 4 plates

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Abstract: A list of 10 species of Laboulbeniales (Fungi, Ascomycotina) from Spain is given. Two species, *Phaulomyces denticulatus* and *Phaulomyces perparvus,* are here proposed as new. The other 8 are new records for Spain. Especially remarkable are *Corethromyces scopaei* and *Zeugandromyces orientalis,* never recorded from Europe (likewise, the genus *Zeugandromyces* is new for Europe). Also, *Aporomyces szaboi* and *Ilyomyces mairei* are second world records as they were only known from their types. These taxa, along with *Cantharomyces denigratus, Cantharomyces italicus, Laboulbenia curtipes* and *Peyritschiella biformis,* are illustrated with line drawings and some new features, not mentioned in previous works, are now described and discussed.

Resumen: Se presenta una lista de 10 especies de Laboulbeniales (Fungi, Ascomycotina) recolectadas en España. Dos especies, *Phaulomyces denticulatus* y *Phaulomyces perparvus* son propuestas como nuevas en este trabajo. Las otras 8 son primeras citas ibéricas, destacando entre ellas *Corethromyces scopaei* y *Zeugandromyces orientalis* novedades para Europa (asimismo, el género *Zeugandromyces* no se conocía en Europa); *Aporomyces szaboi* e *Ilyomyces mairei,* segundas citas mundiales, ya que sólo se conocían por sus descripciones originales (Tipos); en fin, de estos táxones y del resto de especies citadas, *Cantharomyces denigratus, Cantharomyces italicus, Laboulbenia curtipes* y *Peyritschiella biformis* se ofrecen ilustraciones, discusión y descripción de algunas características no especificadas en anteriores trabajos.

Introduction

In the last few years, the number of species of Laboulbeniales known in the Iberian Peninsula and Balearic Islands has increased from 39 species and 7 genera (Balazuc et al. 1983) to 132 species and 43 genera (Santamaria 1989). This paper, together with others in press, has increased the list to 143 species and 46 genera.

A list of 10 species is given here. Two *(Phaulomyces denticulatus* and *Phaulomyces perparvus)* are described as new species; the rest are new Iberian records. *Corethromyces scopaei* and *Zeugandromyces orientalis* are new European records. The genus

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Zeugandromyces was not recorded in the European fungus flora hitherto. The other species are: *Aporomyces szaboi* (previously known only from the type), *Cantharomyces denigratus, Cantharomyces italicus, Ilyomyces mairei* (previously known only from the type), *Laboulbenia curtipes* and *Peyritschiella biformis.*

All the slides have been prepared with lactophenol or cotton blue and stored in BCB-Mycotheca (Herbarium of "Departament de Biologia Animal, Biologia Vegetal i Ecologia", at the author's address). The drawings have been made with a Leitz microscope (VISOPAN) and an OLYMPUS CH-2 microscope.

Aporomyces szaboi Bánhegyi Figs. 1, 2, 3, 4

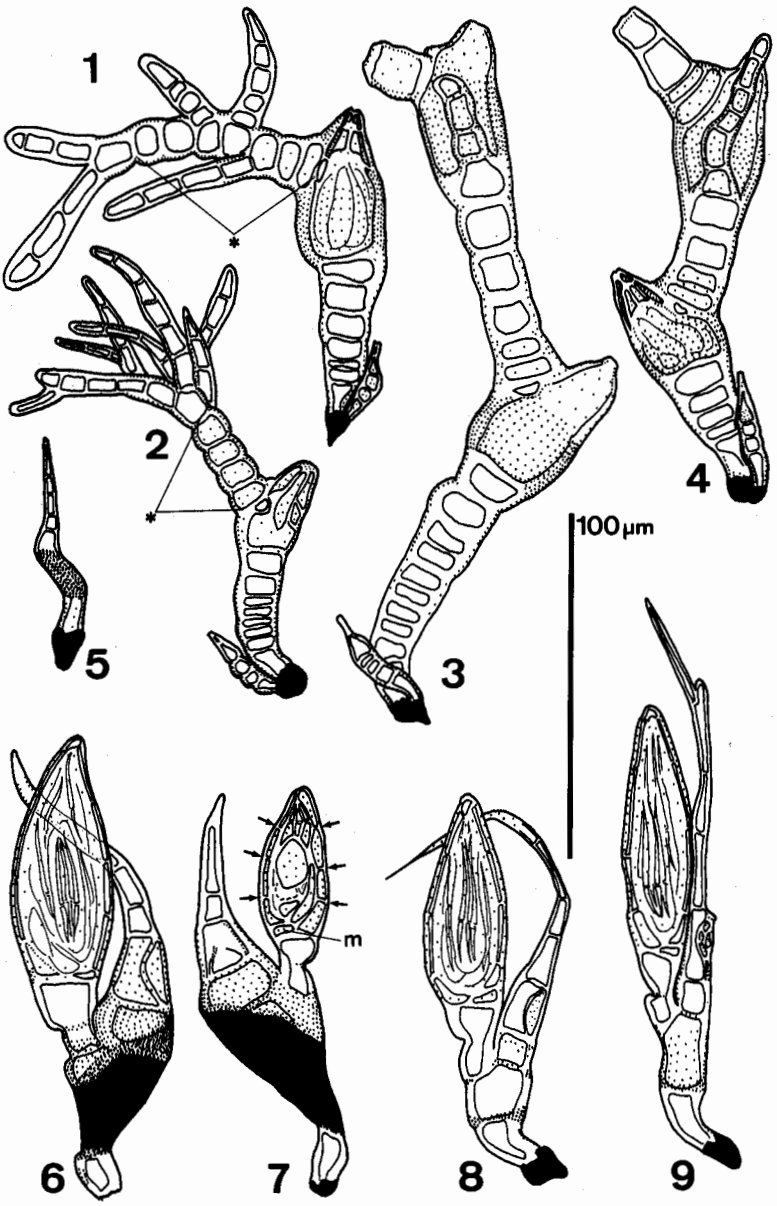
BARCELONA: Mura 31TDG11, spread over the entire body of three specimens of *Limnichus* sp. (Coleoptera Limnichidae) captured on the margins of the Mura river, 23-VII-90, leg. S. Santamaria, BCB-Mycotheca SS964a, SS964b, SS964c.

JAEN: Nava de San Pedro [Parque Natural de las Sierras de Cazorla, Segura y Las Villas], 1400 m, 30SWG09, on the elytra of a single specimen of *Limnichus* sp. (Coleoptera Limnichidae) captured among detritus of reeds, 11-V-90, leg. S. Santamaria, BCB-Mycotheca SS-941. Fuente del Roble [Parque Natural de las Sierras deCazorla, Segura y Las Villas], 1100 m, 30SWH11, on the elytra of a single specimen of *Limnichus* sp. captured at a water pool, 12-V-90, leg. S. Santamaria, BCB-Mycotheca SS950.

Thirteen mature females, ten immature females and ten males of *Aporomyces szaboi* have been studied. The measurements of the specimens examined are: [♀] Total length from base of foot to tip of perithecium, 105-150 μm; Perithecium, 42-50 × 22-33 μm; total length with appendages, 162-212 μm; Ascospore length, 31 μm; [♂] Total length, 25-40 μm; Antheridium length, 8-15 μm; Ascospore length, 18-20 μm.

According to Majewski (1988) *Aporomyces uniflagellatus* Thaxter and *A. szaboi* should be synonyms. Benjamin (1989) and Tavares (1985) differentiate both species basically on the basis of appendage features. In *A. szaboi* the lower cells of the appendage just above the perithecium are upper receptacular cells (large, flattened and rounded laterally -figs. 1-2*-). In *A. uniflagellatus* only one short receptacular cell is above the perithecium. The Iberian specimens examined are fully in agreement with Bánhegyi's description (Bánhegyi, 1944) and with the last redefinition of Benjamin (1989). Figures 1 and 2 show a large number of receptacular cells in the base of the appendage, which is often branched and has several secondary appendages (*A. uniflagellatus* has an unbranched appendage).

Bánhegyi (1944) pointed out that the appendage branches are fused in an amorphous mass; I think that this is the result of deterioration. In the specimens studied, the branches of the appendage are in good condition (figs. 1, 2). According to Benjamin (1989), who only considers Bánhegyi's description and illustrations, the growing of the receptacle inside the perithecia (figs. 3, 4) takes place after the abortion of the primary perithecium. This is seen commonly in the Iberian specimens. Probably, the old perithecia (primary) suffer this modification after the ascospores are released. In all the studied samples (figs. 3, 4), a second perithecium is developed under the first one. The thallus may undergo a more or less continuous development, with the formation of successive perithecia.



Figs. 1, 2, 3 and 4. *Aporomyces szaboi* (Fig. 1: SS964a; Figs. 2-4: SS964c). 1-2. Specimens with unbroken and ramified appendage. Asteriscs (*) delimitate the upper receptacular cells of the appendage. 3-4. Old specimens with two perithecia; the upper ones are empty and a secondary appendage is growing in each perithecium from the base. Figs. 5, 6 and 7. *Cantharomyces denigratus* (Figs. 5-6: SS866c; Fig. 7: SS820). 5. Sporeling. 6. Mature specimen. 7. Young specimen with an immature perithecium showing four cells in each vertical row of outer wall cells and a flattened cell. m. Figs. 8 and 9. *Cantharomyces italicus* (Fig. 8: SS802; Fig. 9: SS995). The slender specimen shown in figure 9 was collected on the pronotum of the host.

The only record known up to now of *A. szaboi* was the type collection of Bánhegyi (l.c.) on *Pelochares versicolor* Waltl (Coleoptera Byrrhidae) from Hungary. The Iberian specimens were collected on *Limnichus* sp. (Coleoptera Limnichidae). Both coleopterous families are closely related (Balazuc, unpublished index, cf. Tavares 1985).

Cantharomyces denigratus Thaxter Figs. 5, 6, 7

GIRONA: Riells i Viabrea, 31TDG62, on lower tip of abdomen of a single *Dryops* sp. (Coleoptera Dryopidae) captured in a small water source, 16-IV-89, leg. S. Santamaria, BCB-Mycotheca SS820. Ibid., in the same place as a single *Dryops* sp. (Coleoptera Dryopidae) -also parasitized by *Cantharomyces italicus* Speg. and *Helodiomyces elegans* Picard- captured at the edges of a rushing stream, 30-VII-89, leg. S. Santamaria, BCB-Mycotheca SS866c. Ibid., in the same place as 4 *Dryops* sp. (Coleoptera Dryopidae) -also parasitized by *Cantharomyces italicus*- captured in the same place, 10-IX-90, leg. S. Santamaria, BCB-Mycotheca SS995.

Seven mature and eight immature specimens of this species have been studied. The measurements of this material are: Total length from base of foot to tip of perithecium, 125-140 μm; Perithecium, 60-70 × 26-30 μm; Primary appendage, 45-58 μm; Ascospore length, 35 μm.

The study of immature thalli showed young perithecia with two dorsal rows of thick wall cells and two ventral rows of narrow wall cells (fig. 7). The perithecial apex is occupied by a large apical wall cell; thus the terminal opening is dorsal. The cell m is flattened and is clearly distinguishable, but the n and n' cells are inconspicuous (fig. 7).

This species was only found previously by Thaxter (1931) on *Parnus* spp. (= *Dryops*) from England (Type) and by W. Siemaszko & J. Siemaszko (1933) on *Dryops* from Poland. *Cantharomyces denigratus* typically parasitizes the lower surface of the abdomen tip of the genus *Dryops* (Coleoptera Dryopidae) and often lives together with *Cantharomyces italicus* Speg.

Cantharomyces italicus Speg. Figs. 8, 9

GIRONA: Riells i Viabrea, 31TDG62, on elytra of a single *Dryops* sp. (Coleoptera Dryopidae) captured at the edges of a rushing stream, 3-VII-88, leg. S. Santamaria, BCB-Mycotheca SS802. Ibid., on one *Dryops* sp., VIII-88, leg. S. Santamaria, BCB-Mycotheca SS803a, SS803b. Ibid., on one *Dryops* sp., 2-VII-89, leg. S. Santamaria, BCB-Mycotheca SS857. Ibid., on one *Dryops* sp. (also parasitized by *Cantharomyces denigratus* and *Helodiomyces elegans*), 30-VII-89, leg. S. Santamaria, BCB-Mycotheca SS866a. Ibid., on one *Dryops* sp. (also parasitized by *Helodiomyces elegans*), 11-VIII-89, leg. S. Santamaria, BCB-Mycotheca SS876. Ibid., on one *Dryops* sp., 18-III-90, leg. S. Santamaria, BCB-Mycotheca SS895. Ibid., on one *Dryops* sp., 30-VI-90, leg. S. Santamaria, BCB-Mycotheca SS958. Ibid., on 4 specimens of *Dryops* sp. (also parasitized by *Cantharomyces denigratus),* 10-IX-90, leg. S. Santamaria, BCB-Mycotheca SS995.

Eleven mature specimens and one immature specimen of this species have been studied. The measurements for the Iberian material are: Total length from base to tip of perithecium, 112-143 μm; Perithecium, 52-75 × 15-25 μm; Primary appendage, 55-118 μm; Ascospore length, 39-40 μm.

The perithecial features pointed out for *Cantharomyces denigratus* Thaxter (see above) are valid for *Cantharomyces italicus*. The two species are without doubt related; however, they could be separated according to the following features: (1) cell III is wide and swollen in *C. denigratus,* but nearly square in optical section in *C. italicus;* (2) the antheridial cell is flattened and wide in *C. denigratus,* but long and narrow in *C. italicus;* (3) the suprabasal cell of the receptacle is opaque black in *C. denigratus,* but translucent in *C. italicus;* and (4) the basal cell of the receptacle is short and inflated in *C. denigratus,* but normal, obconic in *C. italicus.*

The specimens of *C. italicus* found on the pronotum (fig. 9) are longer (143 μm) than the typical specimens (118-127 μm); they have an almost cylindrical cell II, with parallel walls and two characteristic dark rings.

Cantharomyces italicus shows the same ecology as *C. denigratus,* but occurs on different parts of the body of its host. According to Scheloske (1969) and Rossi (*in litteris*) both species of *Cantharomyces* may be growth-forms of the same taxon. Reported on *Dryops* (Coleoptera Dryopidae) from different European countries: Italy (Spegazzini 1915 -Type-), England (Thaxter 1931), Poland (J. Siemaszko & W. Siemaszko 1933), Germany (Scheloske 1969), Finland and U.S.S.R. (Huldén, 1983).

Corethromyces scopaei Thaxter Figs. 10-15

BARCELONA: Gualba, 31TDG52, on legs and on the lower abdomen of one *Scopaeus* sp. (Coleoptera, Staphylinidae, Paederinae) captured at the margins of the Gualba river, 1-VII-89, leg. S. Santamaria, BCB-Mycotheca SS855a, SS855b. Ibid., on underside of head of one *Scopaeus* sp., 15-Vii-89, leg. Santamaria, BCB-Mycotheca SS862.

GIRONA: Bescanó, 31TDG74, on elytra and abdomen of one *Scopaeus* sp. captured at the margins of Ter river, 12-X-89, leg. J. Girbal, BCB-Mycotheca SS893a, SS893b.

JAEN: Aguamula [Parque Natural de las Sierras de Cazorla, Segura y Las Villas], 800 m, 30SWH11, on pronotum of one *Scopaeus* sp. captured at the margins of Aguamula river, 12-V-90, leg. S. Santamaria, BCB-Mycotheca SS946.

The features and discussion following are based on 15 mature and 16 immature thalli. The measurements of these specimens are: Total length from base of foot to tip of perithecium, (73-)101-150 μm; Perithecium, (44-)55-80 × 15-24 μm; Length from base of cell VI to tip of perithecium, (61-)87-133 μm; Primary appendage, 40-60 μm; Ascospore length, 13-26 μm.

Primary appendage consisting of a number of superimposed cells, nearly square in optical section, with lateral short, unbranched (or poorly ramified) branches supporting intercalary antheridia with short, free lateral necks (figs. 12, 13). Suprabasal cell of receptacle trapezoidal (in optical section), variable, small. Perithecium flask-shaped, with narrow neck of parallel walls, preapical tier of outer wall cells cone-shaped, with rounded sides and with slender transverse grooves, apex rounded. Some sporelings (figs. 10, 11) showed the spinelike projection at the tip of the thallus which is the remnant of the spore apex; later, this projection disappears. The foot blackening is minimal at maturity in some specimens (figs. 12, 13).

Some features seen in the specimens examined have not been mentioned in the origin-

al description of the species. The most significant are the horizontal grooves in the preapical wall tier of the perithecium. This character was likely to be overlooked by Thaxter because its observation is very difficult in unstained specimens. Nevertheless, the distinctive traits are in agreement with Thaxter's species.

Only known from Argentina (Thaxter 1931 and Spegazzini 1917). This striking species could have been easily overlooked because of the small size of the specimens and their pale color. Parasitizes Coleoptera Staphylinidae Paederinae of the genus *Scopaeus.*

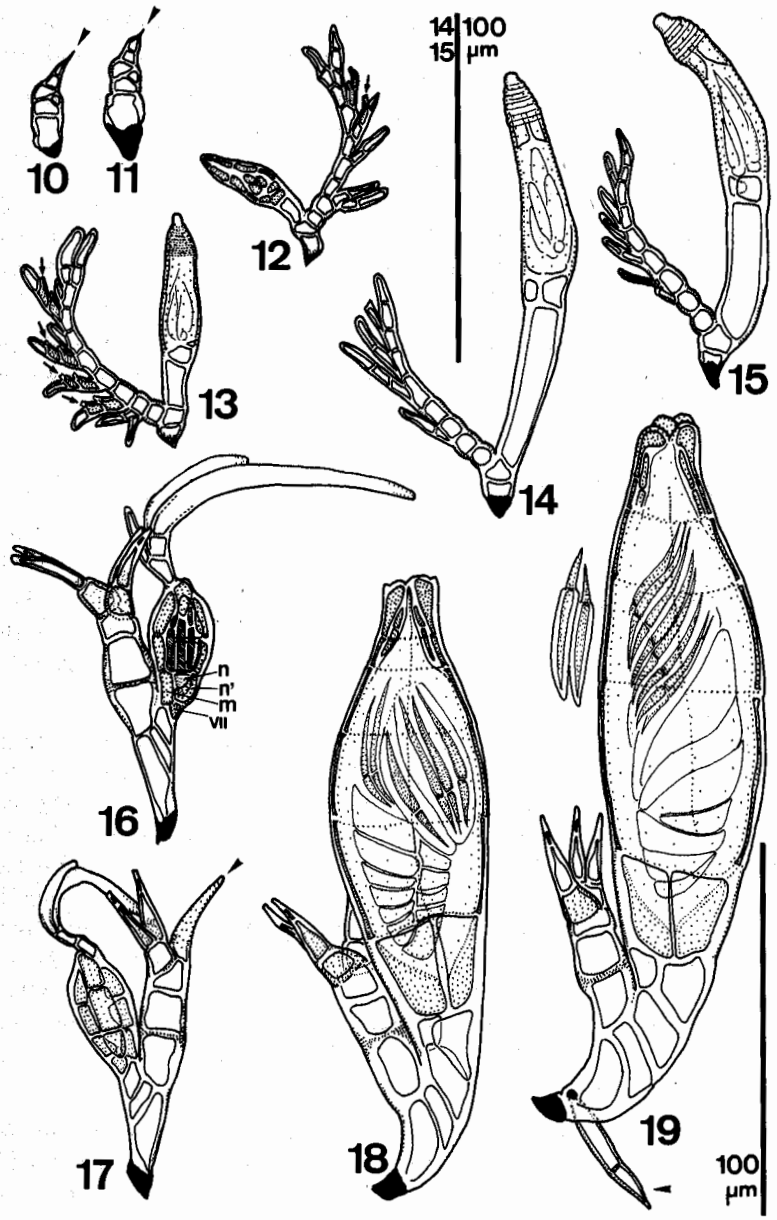
Ilyomyces mairei Picard Figs. 16-19

JAEN: Los Rasos [Parque Natural de las Sierras de Cazorla, Segura y Las Villas], 1360 m, 30SWG08, on elytra of one *Stenus* sp. (Coleoptera Staphylinidae Steninae) captured at the margins of Guadalquivir river, 10-V-90, leg. S. Santamaria, BCB-Mycotheca SS927. Aguamula [Parque Natural de las Sierras de Cazorla, Segura y las Villas], 800 m, 30SWH11, on elytra of one *Stenus* sp. captured at the margins of Aguamula river, 12-V-90, leg. S. Santamaria, BCB-Mycotheca SS944a, SS944b. Ibid., on the legs of one Coleoptera Staphylinidae, Aleocharinae captures at the margins of a rushing stream, 12-V-90, leg. S. Santamaria, BCB-Mycotheca SS949.

Nine mature and 18 immature specimens of this species have been studied. The measurements of the Iberian material are: Total length from base of foot to tip of perithecium, 181-207 μm; Perithecium, 129-157 × 46-52 μm; Primary appendage, 49-58 μm; Ascospore length, 37-43 μm.

The specimens examined showed some variations when compared with the original description of *Ilyomyces mairei* (cf. Picard 1917). The primary appendage is very similar to that described by Picard, although the spine-like projection of the persistent spore apex shown in the illustration of Picard (1917) is not seen in the Iberian samples. The sporelings studied (fig. 19, arrow) have a pointed but not spine-shaped apex, unlike those found in other genera of Stigmatomycetinae (cf. *Acompsomyces, Synandromyces, Prolixandromyces,* etc.). The 4 antheridia are characteristic of this species, arranged in two pairs at the apex of the appendage. Probably, one of the four antheridia (which often degenerate soon or is nonfunctional) could correspond to the spore apex (fig. 17, arrow). Picard (1917) illustrated the appendage of *I. mairei* but mislabelled it as *Ilyomyces lavagnei* Picard. Picard's original drawing of the receptacle of *I. mairei* shows a horizontal wall between the cells II and VI. On the contrary in the Iberian specimens and also in *I. lavagnei* this wall is oblique. The comparison between perithecia described originally for *I. mairei* and *I. lavagnei* and the specimens examined showed a series of conflicting variations. In *I. lavagnei* the perithecium is long and narrow, with a poorly differentiated tip, but in *I. mairei* it is ornamented with apical outgrowths; the Iberian material is different in this aspect.

From Balazuc's collection I have received three slides labeled *Ilyomyces lavagnei,* from two different French lacalities. One slide comprises one thallus of the typical *I. lavagnei* (from Areyron, France). The two others are similar to the Iberian samples (in consequence I think that they may be *I. mairei),* but with two teeth-like outgrowths in the subapical outer wall tier of the perithecium. These outgrowths are absent or are very small in the Iberian specimens (fig. 18). Often we found three antheridia and not the more typical number of four. The variations in all the samples



Figs. 10, 11, 12, 13, 14 and 15. *Corethromyces scopaei* (Figs. 10-11: SS893b; Figs. 12-13: SS893a; Figs. 14-15: SS855). 10-11. Two sporelings with the spine-like projection of the persistent spore apex (arrows). 12. Young specimen. 13-15. Mature specimens. The arrows in figures 12 and 13 show the antheridia. Figs. 16, 17, 18 and 19. *Ilyomyces mairei* (Figs. 16-17: SS927; Figs. 18-19: SS944a). 16-17. Two young specimens with a trichogyne and details of the basal cells of the perithecium. In figure 17 the arrow shows the probable spore apex. 18-19. Two mature specimens and one sporeling (Fig. 19, arrow).

studied in comparison with the protologues of both species could indicate that they are synonyms. However, many more samples need to be collected and studied.

The study of young specimens shows the lack of the spine-like projection of the persistent spore apex and the presence of a striking trichogyne (figs. 16, 17) with two or three great unicellular branches which arise from the same basal point.

This species was described by Picard (1917) and has not been found again since his description. Unfortunately, the Picard collection of Laboulbeniales is lost with all the types (Balazuc, personal communication) and therefore, only his publications were available for comparison. The Iberian samples are more similar to *I. mairei.*

The two known species of the genus *Ilyomyces* parasitize the ripicolous staphylinids of the genus *Stenus* (Staphylinidae, Steninae). The two species were only known from France.

Laboulbenia curtipes Thaxter Figs. 20-25

GIRONA: Margins of Susqueda dam, Susqueda, 31TDG64, on legs of two specimens of *Notaphus* sp. (Coleoptera Carabidae Bembidiinae), 28-IV-90, leg. J. Girbal, BCB-Mycotheca SS917b, SS917c.

The material examined consists of 32 mature and 12 immature specimens. The measurements of this material are: Total length from base of foot to tip of perithecium, 167-218 μm; Perithecium, 107-137 × 39-55 μm; Primary appendage, (29-)41-68 μm; Ascospore length, 40 μm.

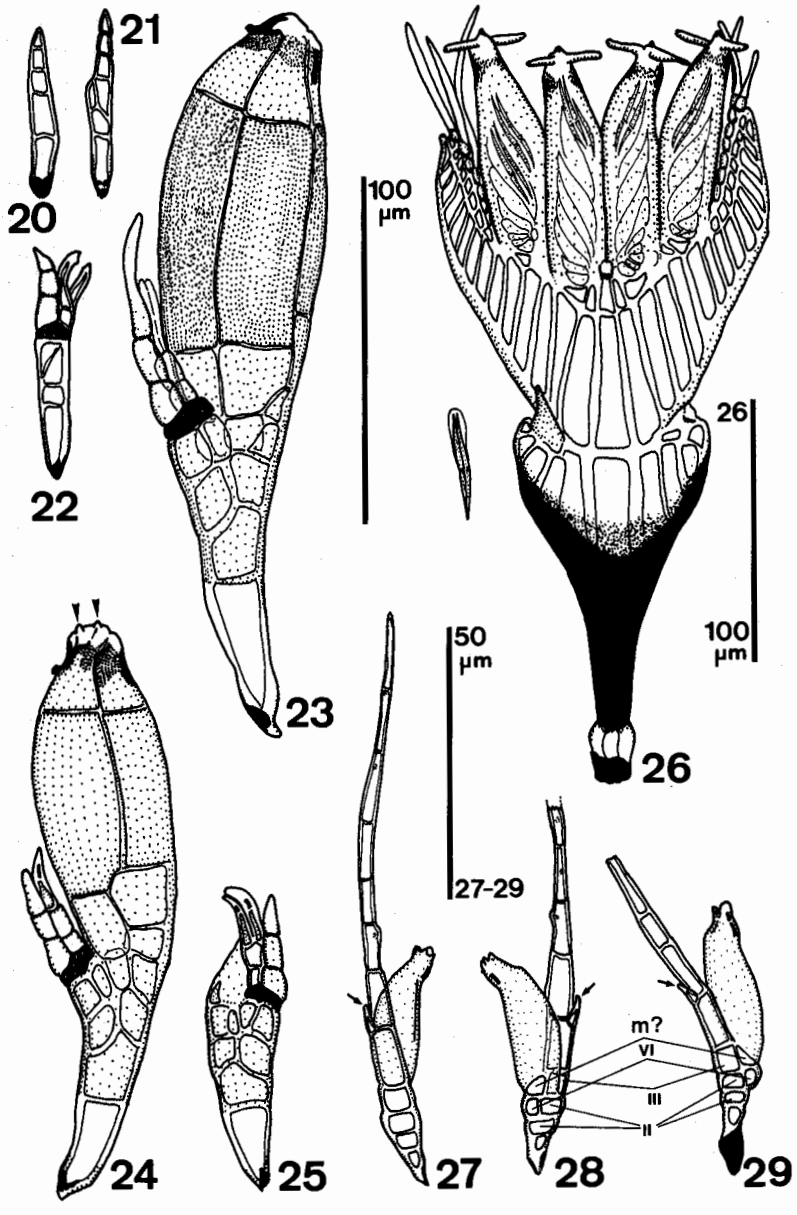
The exact structure of the primary appendage has been determined by the study of young thalli (figs. 22, 25). The outer appendage basal cell is larger than the basal cell of the inner appendage, but it is similar in form. The outer appendage is simple and short, consisting of three cells which are separated by constricted black septa. The basal cell of inner appendage directly supports one or two sickle-shaped antheridia with or without their respective supporting cells. Thaxter's description (1896) indicates a very ramified appendage. The specimen reported and illustrated by Huldén (1983) is very similar to the Iberian ones, but differs from these by having a slender perithecial apex. Often, the swollen perithecia have small round outgrowths on the apical wall cells (fig. 24, arrows). The difference between the appendages and perithecia of American and European specimens should be analyzed carefully because there could be two different species.

Reported by Thaxter (1892) on *Peryphus bimaculatus* Kirby (as *Bembidium bimaculatus)* from U.S.A. and by Huldén (1983 and 1985) on *Bembidion* from Finland, U.S.S.R. and Sweden. The typical European host belongs to the genus *Notaphus* (reported by Huldén as the subgenus *Notaphus* of *Bembidion).*

Peyritschiella biformis (Thaxter) I. Tavares Fig. 26

≡ *Dichomyces biformis* Thaxter

GIRONA: Riells i Viabrea, 31TDG62, the entire body of one *Philonthus* sp. (also parasitized by *Laboulbenia philonthi* Thaxter) captured between wet dead leaves at the margins of a little river, 2-VII-89, leg. S. Şantamaria, BCB-Mycotheca SS856a, SS856b, SS856c.



Figs. 20, 21, 22, 23, 24 and 25. *Laboulbenia curtipes* (Figs. 20-21 and 25: SS917c; Figs. 22-24: SS917b). 20-21. Sporelings. 22 and 25. Immature specimens showing the primary appendage. 23-24. Mature specimens. In figure 24 arrows show two small round outgrowths on the apical wall cells of perithecium. Fig. 26. *Peyritschiella biformis* (SS865a). Figs. 27, 28 and 29. *Phaulomyces denticulatus* (SS779 -Holotype-). 27-28. Two views of the same thallus. The arrows show the antheridium.

Six mature specimens of this species have been studied. The measurements of the specimens examined are: Total length from base of foot to tip of perithecium, 240-300 μm, Perithecium, 88-100 × 22-26 μm; Ascospore length, 41-42 μm; Maximum width of receptacle, 120-135 μm; Length of apical auricles, 12-15 μm.

This is one of the most handsome species of the Iberian Laboulbeniaceous flora. The specimens examined are in complete agreement with the previous descriptions. It parasitizes the genus *Philonthus* (Coleoptera Staphylinidae Staphylininae) from U.S.A., England, Madeira, St. Pierre & Miquelon (Thaxter 1908), Poland (J. Siemaszko & W. Siemaszko 1932), Belgium (Collart 1945), Japan (Sugiyama 1973), Korea (Y.B. Lee & J.Y. Lee 1982) and U.S.S.R. (Huldén 1983).

Phaulomyces denticulatus S. Santamaria sp. nov. Figs. 27-29

Thallus hyalinus. Receptaculum constans ex quattuor cellulis suprapositis; tertia est geminaliter divisa per longitudinalem saeptum; perithecium surget lateraliter ex tertia cellula. Unum perithecium habet subacutum apicem atque angustum collum. Zona preapicalis perithecii est ornata quattuor brevibus expansionibus dentis similibus quarum una eminet. Appendix est simplex, longa, et ostendit apicem acutum. Basis appendicis ex una cellula duplo longiore quam latiore constat atque sustentat unum antheridium in suo supero-externo angulo.

Longitudo unguis-apex perithecii: 45-50 μm. Perithecium: 30 × 8-10 μm. Maxima longitudo usque ad apicem appendicum: 100 μm

HOLOTYPUS: Super Phloeocharis (Scotodytes) sp. in monte Montseny (Cathalonia, Hispania)

Thallus hyaline. Receptacle consisting of 4 cells; basal cell small, obconic; second cell flattened and with rounded sides; third cell separated from the cell VI by a vertical septum; fourth cell (which is probably the cell III) nearly square (5-7 × 4.5-5 μm) in optical section. Appendage long (up to 100 μm), simple, gradually attenuate to acute apex, consisting of several cells longer than broad; the single antheridium with short free lateral neck is found in the upper outer corner of appendage basal cell (12 × 6-7 μm). One lateral perithecium, which arises from the third cell of the receptacle, has its neck abruptly bent at basal level of second wall cell and has a blunt apex; subapical outer wall tier of perithecium with four teeth-like outgrowths, three very minute and the fourth more conspicuous and representing the extra apical cell. Walls of basal cells of perithecium not persistent; except that could be the cell m (Tavares, personal communication). Stalk cell of perithecium with rounded external side. Measurements: Total length from base of foot to tip of perithecium, 45-50 μm; Perithecium, 30 × 8-10 μm.

ETYMOLOGY.- "Denticulatus" (Latin), with teeth-like outgrowths in the subapical, outer wall tier of perithecium.

HOLOTYPE. - BARCELONA: Sta. Fe del Montseny, 31TDG52, on left elytron of one specimen of *Phloeocharis (Scotodytes)* sp. captured in a soil sample of beech forest, 5-VII-1986, leg. P. Andrés, BCB-Mycotheca SS779.

This taxon belongs in the Euphoriomycetinae because of the non-persistent walls of the basal cells of the mature perithecium (except in this species for that could be the cell m), the extra apical cell in one outer wall cell row, and by the character of the

outer wall cells. The sessile antheridium on the appendage basal cell is typical of *Phaulomyces*. The lower receptacle has two cells as in *Phaulomyces* (except *Phaulomyces ephistemi* [Thaxter] I. Tavares). It seems advisable to describe this species as belonging to the genus *Phaulomyces* pending a more thorough study of some genera included in the tribe Euphoriomycetinae.

The above description of *Phaulomyces denticulatus* is based only on two mature specimens. This taxon has been found parasitizing one specimen of an unknown species (probably new) of *Phloeocharis* subgenus *Scotodytes* (Coleoptera Staphylinidae Oxytelinae). These eyeless, endogean beetles have a limited geographical distribution, until now known from the Pyrenees and two localities of southern France. The Iberian host of *Phaulomyces denticulatus* was found in a locality southeast of the Pyrenees, which is now the southernmost record for the host. *Dipodomyces phloeocharidis* Majewski occurs on *Phloeocharis* subgenus *Phloeocharis* which lives under bark but *Scotodytes* is endogean.

Phaulomyces perparvus S. Santamaria sp. nov. Figs. 30-38

Thallus hyalinus, praeter cellulam I et totam vel partim cellulam II quae sunt brunheae. Inferior receptaculum constans ex (3)-4 cellulis; cellula I obconica; cellulas IIn complanatas cum marginibus turgidis; perithecium surget lateraliter ex quarta (tertia) cellula. Cellula III est isodiametrica vel complanata. Perithecium pyriformis, apice subacuto atque levitertorto. Cellula VI ex cellula IIn per longitudinalem saeptum separata est. Appendix primaria simplex, longa, apice acuto, cum 2-3 cellulis basalibus turgidis isodiametricisque. Antheridium ampulliformis, inconspicuum, super cellulas basales appendicis.

Longitudo unguis-apex perithecii: 45-58 μm. Perithecium: 25-30 $\times$ 10-15 μm. Ascosporae: 15-20 μm. Maxima longitudo usque ad apicem appendicum: 62-100 μm.

HOLOTYPUS: Super Atomariam fuscicollis in loco Bellaterra (Cathalonia, Hispania)

Thallus hyaline, except for the basal cell of the receptacle and all or part of the second receptacular cell, both of which are deeply pigmented brown (probably due to the darkening of the foot). Specimens always paired. Receptacle consisting of two or three superimposed cells under the perithecium; basal cell obconic; cells II_1 and II_2 flattened, rounded externally. Appendage long, slender, simple, gradually attenuate to the acute tip, consisting of two or three basal cells more or less isodiametric and several cells longer than broad; primary septum not defined; probably the cell immediately above the II_n cell producing the perithecium is the cell III; this cell often is broader than long; only one antheridium observed in a single specimen on the second cell of the primary appendage (fig. 38); antheridium very minute, flask-shaped, probably evanescent and with a reduced capacity to form spermatia. One perithecium in each thallus (more rarely a second perithecium starts to develop), with a swollen venter, perithecium slightly bent at base of the slender neck; blunt apex often laterally bent; three cells in each vertical row of perithecial wall cells; asci with 4 ascospores (fig. 36). The perithecium arises from the third or fourth receptacular cell; the stalk cell is separated from the II_n by one vertical septum. Measurements: Total length from base of foot to tip of perithecium, 45-58 μm; Perithecium, 25-30 $\times$ 10-15 μm; Maximum length with unbroken appendage, 62-100 μm; Ascospore length, 15-20 μm.

ETYMOLOGY. - "Perparvus" (Latin), very small, from *per-* very and *parvus* small.

HOLOTYPE. - BARCELONA: Bellaterra, 31TDF29, on elytra and pronotum of *Atomaria fuscicollis* Mann. (Coleoptera Cryptophagidae) captured with sunken trap, 17-IV-90, leg. S. Santamaria, BCB-Mycotheca SS913a.

ISOTYPES. - BARCELONA: Ibid., BCB-Mycotheca SS913b, SS913c.

PARATYPES. - BARCELONA: Ibid., on antennae and elytra of *Atomaria fuscicollis* Mann. captured with sunken trap, 6-IV-87, leg. S. Santamaria, BCB-Mycotheca SS649a, SS649b, SS649c. Ibid., on elytra of *Atomaria fuscicollis* Mann., 3-IV-90, leg. S. Santamaria, BCB-Mycotheca SS914. Ibid., 30-IV-87, leg. S. Santamaria, BCB-Mycotheca SS925. Ibid., 14-V-87, leg. S. Santamaria, BCB-Mycotheca SS926.

The above description of *Phaulomyces perparvus* is based on 4 mature and 76 immature specimens. This species has the smallest individuals among all Iberian Laboulbeniales. This species is very similar to *Phaulomyces ephistemi* (Thaxter) I. Tavares and was at first mistaken for it (Santamaria 1989). However, *P. ephistemi* differs from *P. perparvus* by a much wider receptacle, and by the absence of the deeply pigmented basal receptacle.

Zeugandromyces orientalis (Thaxter) I. Tavares Figs. 39-41

≡ *Stigmatomyces orientalis* Thaxter

BARCELONA: Gualba, 31TDG52, on abdomen and between the coxae of posterior legs of one *Scopaeus* sp. captured at the margins of Gualba river, 15-VII-89, leg. S. Santamaria, BCB-Mycotheca SS859a, SS859b.
GIRONA: Riells i Viabrea, 31TDG62, on the legs and on the lower side of the body of one *Scopaeus* sp. captured at the margins of a rushing stream, 11-VI-89, leg. S. Santamarla, BCB-Mycotheca SS846a, SS846b, SS846c.

The Iberian material studied consists of 12 mature and 2 immature specimens. The measurements of these samples are: Total length from base of foot to tip of perithecium, 194-263 μm; Perithecium, 114-154 × 37-47 μm; Perithecium and stalk cell, 150-227 μm; Primary appendage, 34-53 μm; Ascospore length, 24 μm.

The specimens studied are fully in agreement with the original description. The spinelike projection of the persistent spore apex (not indicated in Thaxter's drawings in 1931) is on the outer side of the appendage (figs. 39, 41).

This is the first European record of the genus *Zeugandromyces; Z. orientalis* parasitizes staphylinid beetles of the genus *Scopaeus* (Staphylinidae Paederinae) (see above for *Corethromyces scopaei* Thaxter) and has been reported from Philippines (Thaxter 1931), Japan (Majewski & Sugiyama 1985) and Malaysia (Sugiyama & Majewski 1985).

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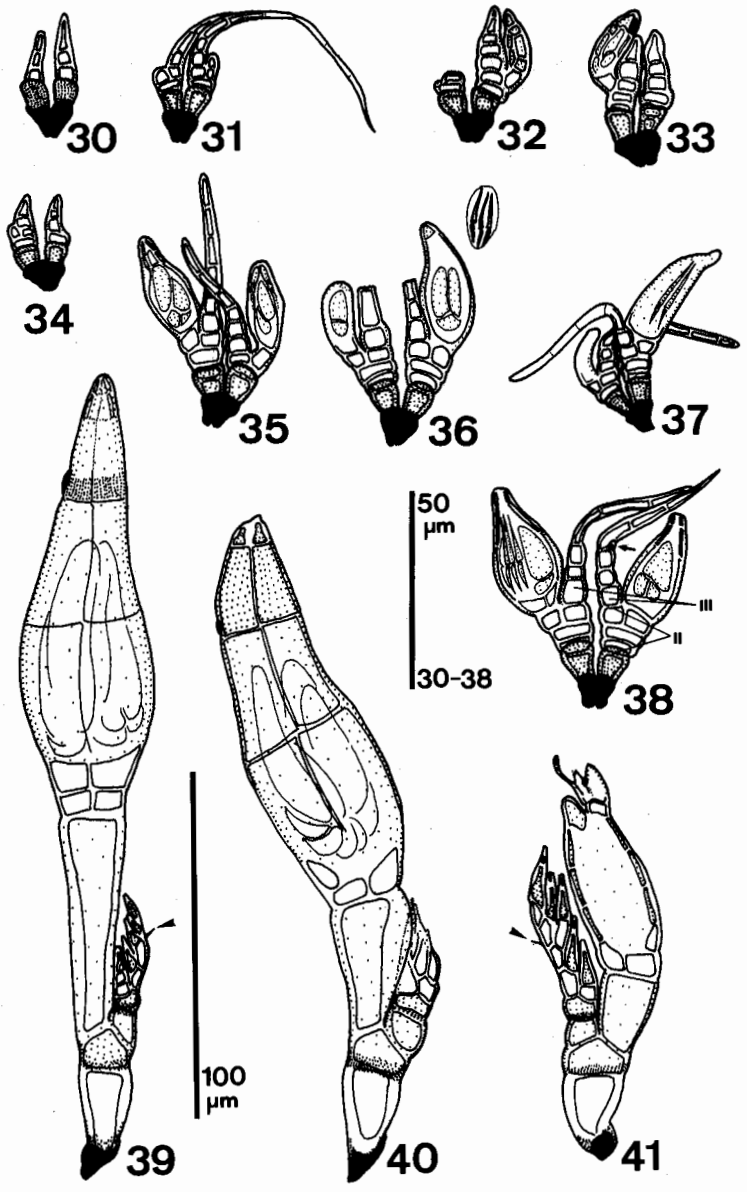

Figs. 30, 31, 32, 33, 34, 35, 36, 37 and 38. *Phaulomyces perparvus* (Figs. 30, 31, 34 and 37: SS649b -Paratypes-; Figs. 32, 33, 35, 36 and 38: SS913a -Holotype-). Different stages of development. Figure 36 shows one ascus from one broken perithecium. 38. Arrow indicates the antheridium; details of receptacular cells. Figs. 39, 40 and 41. *Zeugandromyces orientalis* (Figs. 39-40: SS846a; Fig. 41: SS846b). Arrows indicate the persistent spore apex.

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