

Three new species and a new record of *Diplococcium* from plant debris in Spain

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Abstract *Diplococcium dimorphosporum* sp. nov., *D. racemosum* sp. nov., *D. singulare* sp. nov. and *D. pulneyense* Subram. & Sekar collected from plant debris in natural areas of Spain are described and illustrated. The first species is characterized principally by the production of branched conidiophores and short chains of conidia. *Diplococcium singulare* has unbranched conidiophores, and conidia produced usually at the tip of conidiophores and from lateral spherical conidiogenous cells. In addition, both species develop a *Selenosporella* synanamorph with narrow falcate conidia. *Diplococcium racemosum* produces branched, verrucose conidiophores, and verrucose conidia in long branched chains. *Diplococcium pulneyense* is the second record, being described for first time on the natural substratum and re-described in pure culture. A key to currently accepted species of *Diplococcium* is provided.

Keywords Anamorphic fungi ·
Selenosporella synanamorph · taxonomy.

Taxonomical novelties. *Diplococcium dimorphosporum* M. Hern.-Rest., J. Mena, Gené & Guarro sp. nov., *Diplococcium racemosum* Silvera, Mercado, Gené & Guarro sp. nov., *Diplococcium singulare* M. Hern.-Rest., J. Mena, Gené & Guarro, sp. nov.

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Introduction

The Iberian Peninsula is considered one of the most important European reservoirs of biodiversity. Its rich vegetation and varied climatic regimes favour the development of a great mycobiota diversity. However, microfungi, especially anamorphic fungi, are poorly known from this region. During a survey of microfungi associate with plant debris in natural areas of Spain four interesting anamorphic fungi belonging to the genus *Diplococcium* Grove were found.

Species of *Diplococcium* are characterized by the production of simple or branched catenate conidia, originating from polytretic conidiogenous cells, mostly branched but also simple conidiophores are present in some species. The genus *Diplococcium* is morphologically similar to *Spadicoides* Hughes, conidial catenation being the only character for separating the genera (Goh and Hyde 1998). Although more than thirty species of *Diplococcium* have been described, up to now only 24 are currently accepted in the genus (Braun et al. 1996, Goh and Hyde 1998, Wang and Sutton 1998, Cruz et al. 2007). Two of these species, i.e. *D. stoveri* (M.B. Ellis) R.C. Sinclair, Eicker & Bhat and *D. hugesii* Wang & Sutton, have been reported respectively with a phialidic synanamorph (Shirouzu and Harada 2008) or a *Selenosporella* synanamorph (Wang and Sutton 1998).

Diplococcium has been associated to *Helminthosphaeria* Fuckel, a member of Helminthosphaeriaceae (Sordariales, Sordariomycetes) (Subramanian 1983; Samuels et al. 1997; Goh and Hyde 1998), and to *Othia pulneyensis* Subram. & Sekar, a member of Botryosphaeriaceae (Botryosphaeriales, Dothideomycetes), but only in the last species anamorph-teleomorph connection has been established on single-spore culture (Subramanian and Sekar 1987). Recent molecular data demonstrated that *Diplococcium* is a polyphyletic genus, with some members related

to Dothideomycetes and others to Leotiomycetes (Shenoy et al. 2007, 2010).

The combined morphological features observed in three of the fungi found in the Spanish localities do not fit any of the currently known *Diplococcium* species and are, therefore, described here as new. The fourth specimen was identified as *D. pulneyense* Subram. & Sekar, an anamorph only described in vitro.

Materials and methods

Site and sample procedure

Plant specimens were collected from two areas of the north of Spain, i.e. the Picos de Europa National Park located in Asturias, and the Ordesa y Monte Perdido National Park located in the Aragon Pyrenees. Additional collections were also made at the eastern end of the peninsula in Valencia Province.

In the first locality, the park covers an area of 65,000 ha. The relief is very uneven, with big altitude differences and peaks substantially higher than 2,000 m, like Torre Cerredo (2,648 m). Weather conditions are characterized by high humidity and heavy cloud cover. The average temperature in the area varies from 15°C in July and just 3°C in January. The Picos de Europa receives plentiful snowfalls between November and February. Precipitation varies between 1,000 and 1,500 mm. The vegetation type is Atlantic forest, composed of chestnut, holm oak and, especially, beech.

The Ordesa y Monte Perdido National Park was recognized in 1997 as a world heritage site. The park covers an area of 15,608 ha and comprises four deep valleys or canyons: Añisclo, Bujaruelo, Escuaín and Pineta. The forest is distributed from 750 to 2,100 m in altitude, with Mediterranean, montane, oro-Mediterranean and sub-alpine biotic zones (Villar & Benito-Alonso 2006). Average temperature varies from 0.4–0.7°C in the coldest months (January and February), to 13°C in the warmest (July and August) and average annual rainfall is an estimated 1,735 mm. The vegetation comprises mainly oaks, pines, hazel and beech trees.

In Valencia, collecting was carried out in northwest part of the Province in the Chera-Sot Natural Park. The park, which covers 6,451 ha, is very rugged and mountainous, with Chera itself located within a rift valley surrounded by peaks rising to 1,100m. It has a Mediterranean climate. The forest area was reduced by fire in the 90s. At present, traces of pine trees can be found in Roden and Aleppo. The holm oak forests, which previously constituted the predominant vegetation, remains in forests of *Quercus rotundifolia* and *Quercus faginea*.

Plant material was collected, put into polyethylene bags, and kept at 4–7°C until they were examined.

Isolation and identification of fungi

Plant debris were placed into moist chambers, incubated at room temperature (ca. 20°C) and examined periodically under the stereomicroscope for a 2-month period. Semipermanent and permanent microscope slides of fungi growing on the natural substratum were mounted in lactic acid 85% or alcohol polyvinyl and examined under light microscope for identification. To get pure cultures, conidia were transferred from the natural substratum to two different media: potato carrot agar (PCA: 20 g potatoes, 20 g carrots, 20 g agar, 1 L distilled water) and oat-meal agar (OA: 30 g oat flakes, 20 g agar, 1 L distilled water) and incubated at 25°C in the dark. Colour notations in parentheses are from Kornerup & Wanscher (1984). Photomicrographs were obtained with a Zeiss AXIO Imager M1 light microscope (Göttingen, Germany) and electron micrographs with a Jeol JSM-6400 scanning electron microscope (Tokyo, Japan).

Taxonomy

Diplococcium dimorphosporum M. Hern.-Rest., J. Mena, Gené & Guarro, sp. nov. (Figs. 1a-c, 4a-f)

Mycobank. MB 518550

Etymology. Latin, *dimorphosporum*, referring to presence of two types of conidia.

Coloniae in substrato naturali effusae, brunneae. *Mycelium* partim superficiale et partim in substrato immersum. *Conidiophora* macronematosa, mononematosa, decumbens, perramosa, fusca, laevia, septata, usque ad 1.75 mm longa, 3–4 µm lata. *Cellulae conidiogenerae* polytreticae, in conidiophoris incorporatae, terminales vel intercalares, cylindricae, brunneae, laeves. *Conidia* breviter blastocatenulata, sicca, acropleurogena, obovoidea vel cylindrica, concoloria, brunnea ad pallide brunnea, laevia, 0-3-septata, 13–22×5–6 µm. *Selenosporellae* synanamorphe: *Conidiophora* macronematosa, mononematosa, erecta ex hyphis vegetativis an velut rami e conidiophoris *Diplococcii* orientia, ad basim atrobrunnea, apicem versus pallidiora, laevia, verticillis induta cellularum conidiogenerarum vel verticillis ramorum ad apices aliquot cellulis cum conidiogenis terminatis. *Cellulae conidiogenerae* polyblasticae in conidiophoris incorporatae vel discretiae ex verticillis, sympodiales, denticulatae, lageniformes, at basim atrobrunneae, apicem versus pallidiores, 8–24×2.5–4 µm. *Conidia* solitaria, in massis mucosis aggregata, falcata vel filiformia, hyalina, laevia, 0-septata, 8–15×0.8–1 µm. Teleomorphosis ignota.

Colonies on the natural substratum effuse, brown. *Mycelium* partly superficial, partly immersed in the sub-

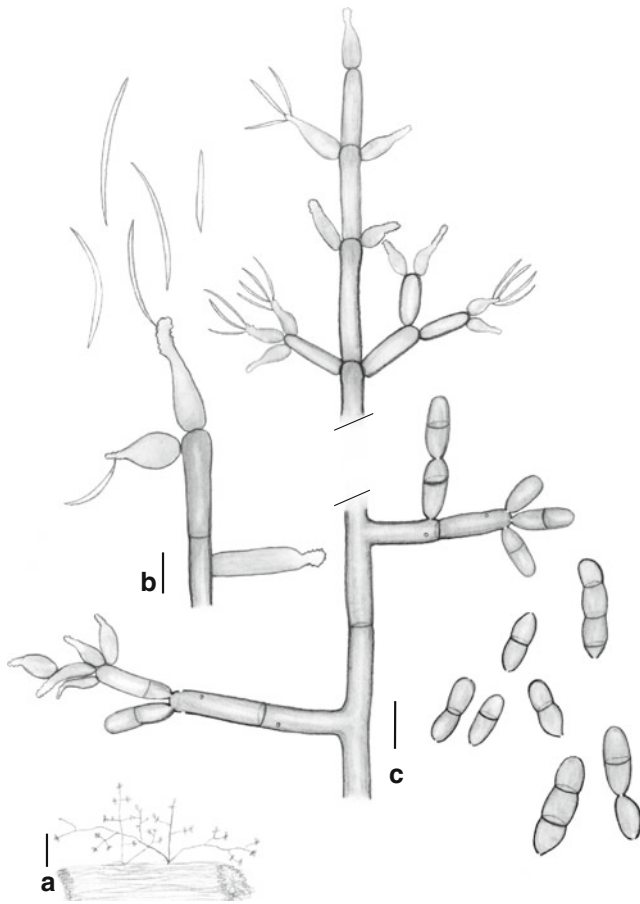


Fig. 1 a–c *Diplococcium dimorphosporum*, IMI 398788: a, habit; b, *Selenospora* synanamorph; c, conidiophores and conidia. Scale bars: a=100 μ m; b, c=10 μ m

stratum. *Conidiophores* macronematous, mononematous, prostrate, extensively branched, dark brown, smooth, septate, up to 1.75 mm long, 3–4 μ m wide. *Conidiogenous cells* polytretic, integrated, terminal or intercalary, cylindrical, brown and smooth. *Conidia* in short chains, dry, acropleurogenous, obovoides or cylindrical, pale brown to middle brown, concolorous, smooth, 0–3-septate, usually slightly constricted at the septa, 13–22 \times 5–6 μ m; sometimes also produced on *Selenospora* conidiophores. *Selenospora* synanamorph: *Conidiophores* macronematous, mononematous, erect from hyphae or as branches from *Diplococcium* conidiophores, simple or branched, brown at the base, paler at the apex, smooth. *Conidiogenous cells* polyblastic, integrated or discrete, arranged in whorls, mostly terminal, with narrow sympodial denticulate apices, lageniform, dark brown at the base, lighter towards the apices, 8–24 \times 2.5–4 μ m. *Conidia* solitary, often accumulated in slimy heads, falcate or filiform, hyaline, smooth, 0-septate, 8–15 \times 0.8–1 μ m. Teleomorph unknown.

Holotype. IMI 398788, Spain, Aragón, Ordesa y Monte Perdido National Park, Bielsa valley, 42°38'47" N, 0°09'

2,18" E, 1195 masl., on dead wood, 18/06/2009, M. Hernández-Restrepo, J. Mena Portales & J. Cano (Isotype: FMR 10787).

Cultures. In spite of the attempts using different techniques, the fungus did not grow in vitro.

Comments. *Diplococcium dimorphosporum* can be distinguished from other species of the genus because its conidia are not banded, it produces very short conidial chains and its conidiophores are smooth and branched. It is morphologically close to *D. clarkii* M.B. Ellis, *D. pandani* B. Huguenin, *D. pulneyense* Subram. & Sekar and *D. stoveri* (M.B. Ellis) R.C. Sinclair, Eicker & Bhat, especially in the size of conidia (Goh and Hyde 1998). However, the conidia of *D. clarkii* are wider (5.6–9 μ m) and banded at the septa, in *D. pandani* they are predominantly non septate, *D. pulneyense* has long and dendroid conidial chains, and the conidia of *D. stoveri* are 1–7-septate and wider (14–33 \times 6–9 μ m), and the conidiophores are unbranched. In *D. hugesii*, the other species of the genus that produces a *Selenospora*-like synanamorph, conidial size of the synanamorph resembles that of the current species, but the *Diplococcium* state conidia are unicellular and smaller (7–12 \times 5–7 μ m) (Wang and Sutton 1998). *Diplococcium stoveri* was described with an in vitro synanamorph, but it has monophialidic conidiogenous cells and the conidia are cylindrical, setulate and 0–4-septate (Shirouzu and Harada 2008).

Diplococcium racemosum Silvera, Mercado, Gené & Guarro sp. nov. (Fig. 2 a–c, Fig. 4g–k)

Mycobank. MB 518556

Etymology. Latin, *racemosum*, referring to the presence of branched conidiophores and branched chains of conidia.

Coloniae in substrato naturali effusae, brunneae vel atrobunneae. *Mycelium* partim superficiale, partim in substrato immersum. *Conidiophora* macronematosa, mononematosa, erecta, ramosa, brunnea, verrucosa, septata, usque ad 750 μ m longa, 3–4.5 μ m crassa; rami usque ad 225 μ m longi, 3–3.5 μ m crassi. *Cellulae conidiogenae* polytreticae, terminales vel intercalares. *Conidia* catenulata, sicca, acropleurogena, ellipsoidea vel cylindrica, brunnea, concoloria, crassitunicata, verrucosa, 1–4-septata (plerumque 1–2-septata), ad septa non tenuiora vel leviter tenuiora, septis cum crassis et atrioribus, 11–36 \times 5–7 μ m. Teleomorphosis ignota.

Colonies on the natural substratum effuse, brown or dark brown. *Mycelium* partly superficial partly immersed in the substratum. *Conidiophores* macronematous, mononematous, erect, branched, brown, distinctly verrucose, septate, up to 750 μ m long, 3–4.5 μ m thick; branches up to 225 μ m long, 3–3.5 μ m thick. *Conidiogenous cells* polytretic, terminal or intercalary. *Conidia* in long and often branched chains, dry, acropleurogenous, ellipsoidal or cylindrical, brown, concolorous, thick-walled, mostly verrucose with

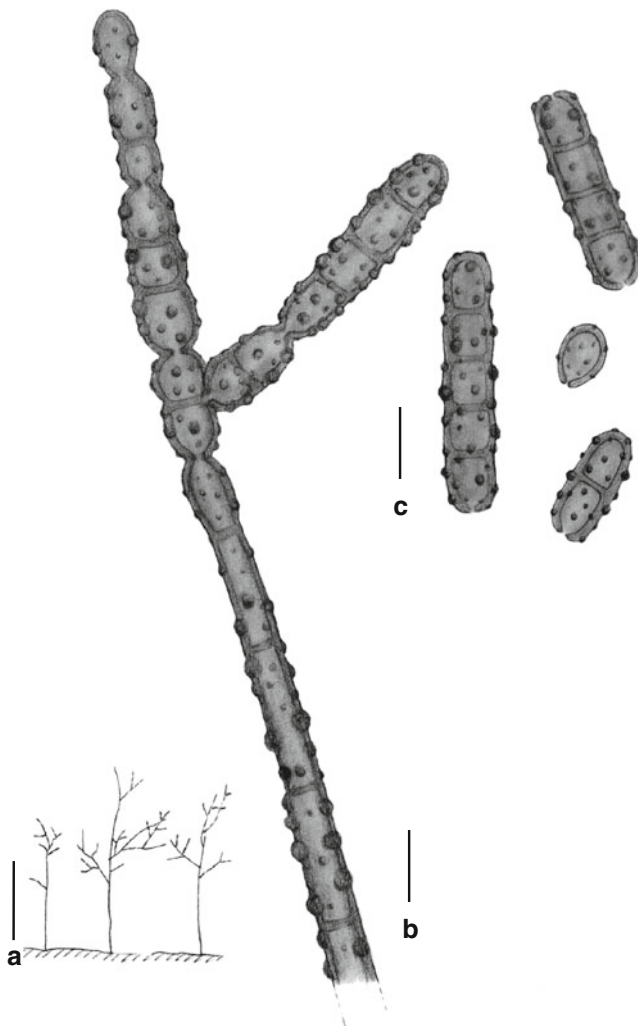


Fig. 2 a-c *Diplococcium racemosum*, IMI 396972: a, habit; b, conidiophores; c, conidia. Scale bars: a=100 µm; b, c=10 µm

conspicuous warts, 1–4-septate (mostly 1–2-septate), not narrower or slightly narrower at the septa, septa thick and dark, $11\text{--}36 \times 5\text{--}7$ µm. Teleomorph unknown.

Holotype. IMI 396972, Spain, Asturias, Picos de Europa National Park, Covadonga, $43^{\circ}18'15,71''$ N, $5^{\circ}03'1,99''$ W, 311 masl., on dead wood, 15/10/2006, A. Mercado-Sierra & C. Silvera (Isotype: FMR 9294).

Cultures. On PCA at 25°C, colonies attained a diameter of 63 mm at 14 days, composed of olive grey (4/E2) and densely cottony mycelial tufts at the centre, with paler and scarce aerial mycelium towards the periphery; reverse olive grey (4/E2) at the centre, colourless towards the periphery. Colonies on OA at 25°C slow-growing, attaining 22–23 mm at 14 days, umbonate, lanose and dark olive grey (3/F3) at the centre, with scarce pale grey (3/D1) aerial mycelium

towards the periphery, margin white, regular and fimbriate; reverse colourless. Sporulation was observed after two weeks. The conidia were larger ($14\text{--}48 \times 5\text{--}7$ µm, 1–6-septate) than those from the natural substratum.

Comments. *Diplococcium racemosum* shows similarities with *D. asperum* Piroz., *D. varieseptatum* Goh & Hyde (Goh and Hyde 1998) and *D. verruculosum* Cruz, Gusmao & Castañeda (Cruz et al. 2007) on the basis of conidial morphology. Additionally, *D. asperum* and *D. verruculosum* also produce verrucose conidia. However, *D. racemosum* mainly differs from the mentioned species in having branched conidiophores and branched conidial chains.

Diplococcium singulare M. Hern.-Rest., J. Mena, Gené & Guarro, sp. nov. (Fig. 3a–d, Fig. 5a–g)

Mycobank. MB 518551

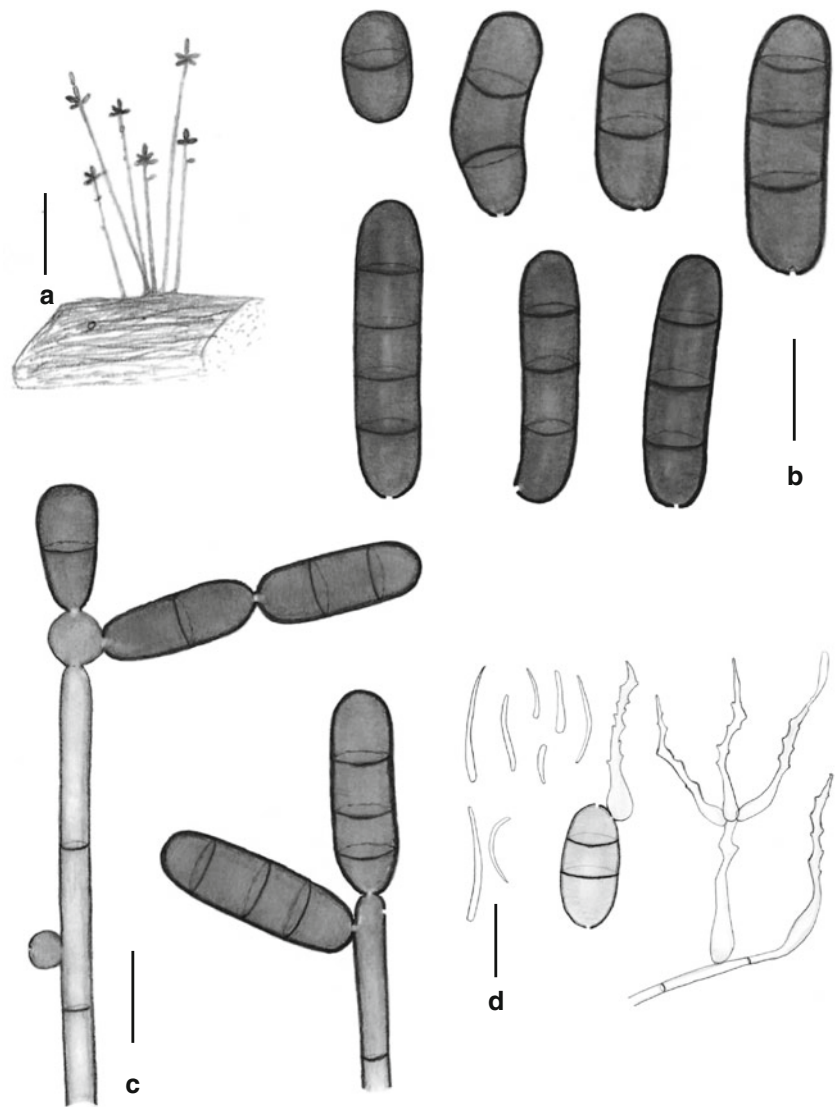
Etymology. Latin, *singulare*, referred to the presence of discrete spherical conidiogenous cells a feature not common in other species of the genus.

Coloniae in substrato naturale effusae, brunneae. *Mycelium* partim superficiale partim in substrato immersum. *Conidiophora* macronematosa, mononematosa vel aggregata, erecta, recta, simplicia, cylindrica, brunnea, laevia, septata, usque 460 µm longa, 2.5–4 µm lata. *Cellulae conidiogena*e polytreticae, terminales vel intercalares, in conidiophoris incorporatae, cylindricae ad clavatae, sed statu discreto sphaericae, 6–7 µm latae. *Conidia* breviter blastocatenulata, sicca, acropleurogena, cylindrica, subcylindrica vel obovoidea, brunnea, laevia, concoloria, 1–4-septata, praecipue 3-septata, ad septa non tenuiora, $12.5\text{--}40 \times 5\text{--}9$ µm. *Selenosporellae* synanamorphe in vitro: *Conidiophora* semi-macronematosa, mononematosa, pallide brunnea, laevia. *Cellulae conidiogena*e polyblasticae, discretae ex verticillis, vel in conidia *Diplococcium* interdum procedentia, sympodiales, lageniformes, pallide brunneae, laevia, $12.5\text{--}32.5 \times 2.5\text{--}3.75$ µm. *Conidia* solitaria, in massis mucosis aggregata, falcata vel filiformia, hyaline, laevia, 0-septata, $6\text{--}13 \times 1$ µm. Teleomorphosis ignota.

Colonies on the natural substratum effuse, dark brown. *Mycelium* partly superficial, partly immersed in the substratum. *Conidiophores* macronematous, mononematous or in small groups, erect, straight, unbranched, cylindrical, brown and smooth, up to 460 µm long, 2.5–4 µm wide. *Conidiogenous cells* polytretic, integrated or discrete, terminal or intercalary, cylindrical to clavate, when discrete spherical, 6–7 µm wide. *Conidia* in short chains, dry, acropleurogenous, cylindrical with rounded ends, subcylindrical to obovoid, brown, concolorous, smooth, 1–4-septate, mainly 3-septate, not narrower at the septa, $12.5\text{--}40 \times 5\text{--}9$ µm. Teleomorph unknown.

Holotype. IMI 398787, Spain, Aragón, Ordesa y Monte Perdido National Park, Fanlo, Añisclo canyon, $42^{\circ}35'34''$ N, $0^{\circ}01'34''$ W, 1315 masl., on dead wood, 19/06/2009, M.

Fig. 3 a–d *Diplococcium singulare*, IMI 398787: a, habit; b, conidia; c, conidiophores, conidiogenous cells and conidia; d, *Selenosporella* synanamorph from culture. Scale bars: a=100 μm ; b–d=10 μm



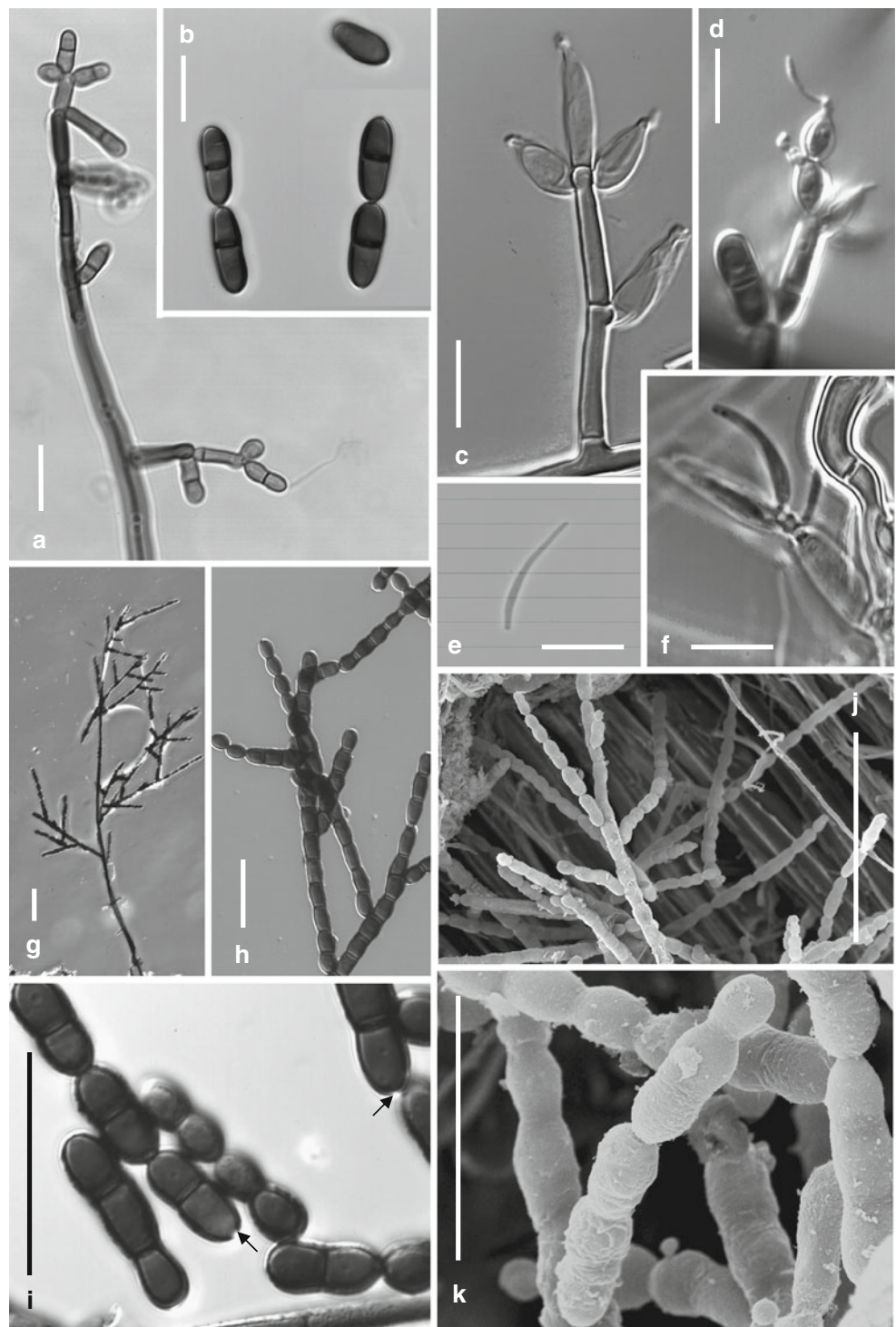
Hernández-Restrepo, J. Mena Portales & J. Cano (Isotype: FMR 10752; Culture ex-type: CBS 126091).

Cultures. Colonies at 25°C after 14 days growing slowly, attaining a diameter of 15–18 mm on PCA and 20–25 mm on OA, cottony, glabrous towards the periphery, dark brown (4E2), margin fimbriate; reverse black. Sporulation was observed after 5 weeks. The conidia were 1-3-septate, 15–25 \times 5.5–7.5 μm . At this period the fungus developed a *Selenosporella* synanamorph not previously observed on the natural substratum. *Selenosporella* synanamorph: *Conidiophores* semi-macronematous, mononematous, bearing whorls of conidiogenous cells, pale brown, smooth. *Conidiogenous cells* polyblastic, discrete arranged in whorls, or growing on *Diplococcium* conidia, or solitary directly from mycelia, sympodial, with a long and denticulated neck, lageniform, pale brown, smooth, 12.5–32.5 \times 2.5–3.75 μm .

Conidia solitary, often accumulated in slimy heads, falcate or filiform, hyaline, smooth, 0-septate, 6–13 \times 1 μm .

Comment. *Diplococcium singulare* resembles *D. clarkii* and *D. variseptatum* Goh & K.D. Hyde in conidial morphology. However, in *D. clarkii* they are smaller (16–32 \times 5.6–9 μm) and with the septa thicker, while those of *D. variseptatum* are larger (11–55 \times 5–15 μm) and with more septa (up to 5-septate) (Goh and Hyde 1998). *Diplococcium singulare* is also distinguished by narrow and unbranched conidiophores and especially by the presence of discrete and spherical conidiogenous cells. The *Selenosporella* synanamorph observed in *D. singulare* is very similar to the synanamorphs described in *D. dimorphosporum* and in *D. hugesii*, but differs only in having conidiophores not well differentiated and conidiogenous cells with a slightly longer neck.

Fig. 4 a–f *Diplococcium dimorphosporum*, IMI 398788: a–b, conidiophore and conidia from the natural substratum; c–f, *Selenosporella* synanamorph from the natural substratum. g–k *Diplococcium racemosum*, IMI 396972: g, h, branched conidiophores from the natural substratum; i–k, branched conidial chains and conidia with pores (arrows). Scale bars: a, k=20 μ m; b–f, h=10 μ m; g=50 μ m; i=25 μ m; j=80 μ m



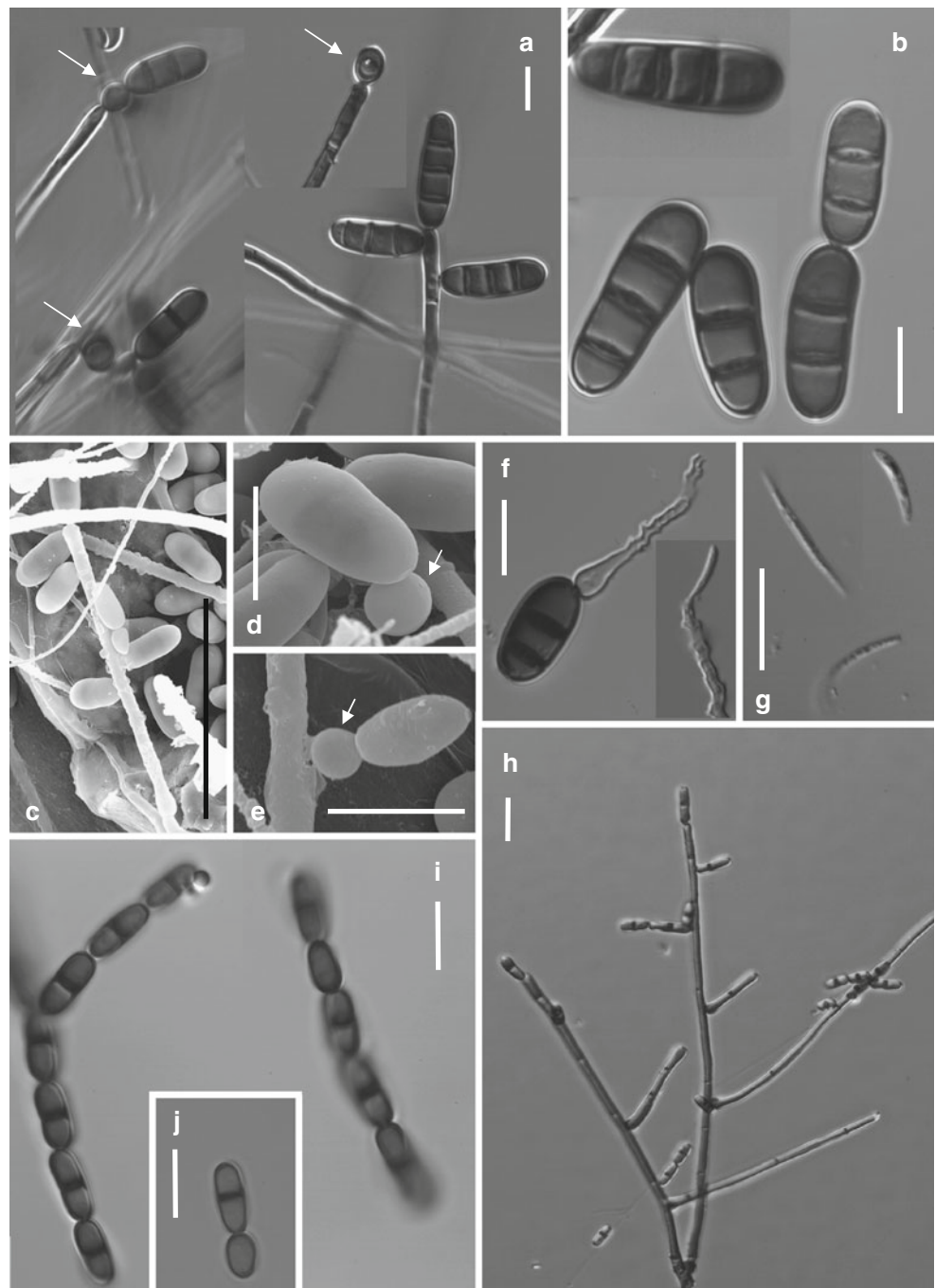
Diplococcium pulneyense Subram. & Sekar, *Kavaka* 15 (1–2): 91 (1987) (Fig. 5h–j)

Colonies on the natural substratum effuse, velvety, brown to dark brown. *Mycelium* partly superficial, partly immersed in the substratum. *Conidiophores* macronematous, mononematous, extensively branched, dark brown, smooth, up to 360 μ m long, 3 μ m wide, 3.5–5 μ m at the apex, 5 μ m at the base. *Conidiogenous cells* polytretic,

pores inconspicuous after conidial secession, integrated, terminal and intercalary, cylindrical, brown and smooth. *Conidia* in branched chains, dry, acropleurogenous, cylindrical, pale brown to mid brown, concolorous, smooth, (0–) 1-septate, 7.5–8.5 \times 4–4.2 μ m (0-septate), 9–15.5 (–17) \times 4–5 μ m (1-septate).

Cultures. On OA and PCA at 25°C colonies growing slowly, attaining a diameter of 15 mm at 14 days, cottony, convex and

Fig. 5 **a–g** *Diplococcium singulare*, IMI 398787: **a–e**, conidiophores with cylindrical and spherical (arrows) conidiogenous cells, and conidia from the natural substratum; **f, g**, *Selenospora* synanamorph from culture. **h–j** *Diplococcium pulneyense*, CBS 127864: **a** branched conidiophore and conidial chains from the natural substratum. Scale bars: **a–g**, **i, j**=10 μ m, **h**=20 μ m



olive brown (4/E4), margin regular to fimbriate; reverse sepia brown (4/F4). Sporulation was obtained after 2 week. Conidia in long and often branched chains, (0-)1(-2)-septate, $6-9.5 \times 4-5 \mu$ m (0-septate), $9-32 \times 4-6 \mu$ m (1-2-septate).

Specimen examined. Spain, Valencia, Chera, Chera-Sot Natural Park, Pantano de Buseo, $39^{\circ}35'40''$ N, $0^{\circ}56'22''$ W, 481 masl., on dead wood, 15/03/2010, M. Hernández-Restrepo & K. Rodríguez (FMR 10959, CBS 127864).

Comment. This species only had been isolated from dead wood in Tamil Nadu, India, and considered the

anamorphic state of *Othia pulneyensis* Subram. & Sekar. The original description of *D. pulneyense* is based only on its development in pure culture. The Spanish specimen on the natural substratum produces smaller and 0-1-septate conidia, but the morphology of the conidia on both OA and PCA fits with that of the protologue (Subramanian and Sekar 1987). A feature not mentioned in the original description of the species is the presence, both in culture and on natural substratum, of aseptate conidia occurring in an intercalary position in the conidial chains.

Key to accepted species of *Diplococcium*

1. Conidia verrucose or verruculose.....2
- 1*. Conidia smooth.....4
2. Conidiophores branched.....*D. racemosum*
- 2*. Conidiophores unbranched.....3
3. Conidia oblong to cylindrical, 1-4-septate, 9–25×4.5–6 µm.....*D. verruculosum*
- 3*. Conidia ellipsoidal to obclavate, 1-septate, 15–20×6–7 µm.....*D. asperum*
4. Conidia often produced on terminal or lateral spherical conidiogenous cells, 1-4-septate (mostly 3-septate).....*D. singulare*
- 4*. Spherical conidiogenous cells absent.....5
5. Conidia versicolored, with one or more cells distinctly darker than the other.....6
- 5*. Conidia concolorous, with all the cells of the same color.....14
6. Conidiophores branched.....7
- 6*. Conidiophores unbranched.....10
7. Conidia 0-septate, ovate to obpyriform, 8.5–13×5.5–8 µm.....*D. parcum*
- 7*. Conidia 1-septate, ellipsoidal, clavate, obclavate or lageniform, 4–6 µm wide.....8
8. Conidiophores dichotomously branched; conidia ellipsoidal, obovoid or clavate, 9–16.5×4.5–6 µm.....*D. lawrencei*
- 8*. Conidiophores irregularly branched; conidia pyriform, obclavate or lageniform.....9
9. Conidia obclavate to lageniform, septum closer to the apex, not constricted at the septum, basal cell darker than apical cell, 11–20×4.5–5 µm.....*D. bicolor*
- 9*. Conidia pyriform to ellipsoidal, septum closer to the base, constricted at the septum, apical cell darker than the basal cell, 5–13×4–5 µm.....*D. aquaticum*
10. Conidia 1-septate, 11–15×3–4.5 µm; on dead grass culms.....*D. graminearum*
- 10*. Conidia 2- or 3-septate, 9.5–40 µm long, 7–13 µm wide; on dead leaves or rotten wood.....11
11. Conidia 2-septate, constricted at septa, subellipsoidal, central cell larger and darker than end cells, 17–25×7–9 µm, borne in acropetal chains; occurring on dead leaves.....*D. laxusporum*
- 11*. Conidia 2- or 3-septate, of other shapes or combination of conidial characters not as above; occurring on rotten wood.....12
12. Conidia 2-septate, usually with the base broader than the apex, 9.5–22×8–11 µm.....*D. insolitum*
- 12*. Conidia mostly 3-septate, apex broader than the base.....13
13. Conidia 20–40×8–10 µm, constricted at the septa.....*D. constrictum*
- 13*. Conidia 16–26×8–13 µm, not constricted or rarely slightly constricted at the septa.....*D. grovei*
14. Conidiophores branched.....15
- 14*. Conidiophores unbranched.....23
15. Conidia clavate, obclavate, ellipsoidal or subcylindrical, 5.5–15 µm wide; occurring on fruit bodies of basidiomycetes.....16
- 15*. Conidia subglobose, oblong, obovoid or cylindrical, 3–7.5 µm wide; occurring on wood or leaves.....18
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