

NOTES ON THE GENUS *SORDARIA* IN SPAIN
Sordaria elongatispora, a new coprophilous species (Pyrenomycetes)

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Sordaria elongatispora Barrasa, Lundq. & Moreno is proposed as a new species, characterized by its large, narrow spores. It is compared with related taxa and a key is given to the four known, narrow-spored species of the genus, three of which occur in Spain: *S. baltica* Lundq., *S. elongatispora*, and *S. papillata* Urries.

Sordaria Ces. & De Not. was once a very wide genus including many kinds of mostly coprophilous pyrenomycetes with pigmented spores having all sorts of appendages and gelatinous equipments. The most aberrant species were gradually transferred to other genera, but even as late as in the 1930's Cain (1934) and Rostrup (1935) still incorporated species with appendaged spores. Moreau (1953) was the first to circumscribe *Sordaria* in a modern sense and to restrict it to species having one-celled, dark spores with a basal germ pore and cylindrical asci with an apical ring.

Today *Sordaria* contains c. 20 members, some of which are common cosmopolitans, others known only from more restricted regions. Practically all the taxa are coprophilous with a preference for certain kinds of dung (Lundqvist, 1972: 22, 300).

Sordaria is a well defined genus, but several of its species are difficult to distinguish from one another, at least from a morphological point of view. Perithecia, asci, and spores give remarkably meagre, taxonomic information at the specific level compared to those of species in many other genera in the Sordariaceae sensu lato. The only interspecific variation of the spores seems to be in size, form, and presence of a gelatinous sheath.

Lundqvist (1972) described two new, narrow-spored species, *S. alcina* and *S. baltica*, and drew attention to the length/width ratio of the spores as a useful diagnostic character. These fungi have a ratio of 2–2.5, whereas that of other Sordariae is smaller.

With this study we intend to survey the Spanish *Sordaria* species with narrow spores, proposing *S. elongatispora* as a new species, and also to introduce i.a. a second record of the rare *S. papillata* Urries, once described from Spain.

MATERIALS AND METHODS

Dung samples have been incubated with the moist chamber method except for *S. baltica*. The fungi were then mounted in water and studied with light microscopy. The photographs were taken with a Nikon 'Optiphot' microscope with automatic camera.

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The Spanish material has been filed in the herbarium of the Department of Botany, Alcalá de Henares University. An isotype slide of *S. elongatispora* is preserved at the herbarium of the Swedish Museum of Natural History, Stockholm, Sweden (S).

DESCRIPTIONS

Sordaria alcina Lundq., 1972: 326. — Figs. 1, 5C

Perithecia 385–580 × 380–480 μm with peridial cells 6–8 μm in diam. Asci 240–265 × 12–14 μm . Spores 21–26.5 × 9.5–12 μm , ellipsoidal to cylindrical with a rounded apex and slightly tapering base and with a gelatinous sheath.

Lundqvist (1972: 326) states the spores to be 'usually slightly apiculate below', but this is only just visible in some immature spores.

The species is found on cervine dung from Fennoscandia and Canada and apparently has a circumboreal distribution.

Sordaria baltica Lundq., 1972: 328. — Figs. 2, 5A

Perithecia 530–570 × 385–430 μm with peridial cells 6–18 μm in diam. Asci 240–270 × 14–16 μm . Spores 25–31 × 12–14 μm , narrowly ellipsoidal with tapering ends and a gelatinous sheath.

Specimens examined. — On horse dung (*Equus caballus*), Port of Cotos (Madrid), alt. 1830 m, *J. M. Barrasa & F. Esteve-Raventós*, 11 Apr. 1984 (herb. Barrasa-Moreno 3535).

The species is easily distinguished from *S. alcina* by its larger spores with tapering ends. Furthermore, it is known to grow only on horse dung. The species with the greatest resemblance as to spore size and habitat is *S. papillata* Urries (see below).

The known distribution of *S. baltica* has hitherto been Scandinavia, Iceland and Czechoslovakia. The Spanish record seems to contradict the concept of *S. baltica* as a boreal to north temperate species, but the collection was made early in the year at a high altitude with corresponding optimal temperature and humidity. The Czechoslovakian find also comes from high altitude (Lower Tatra Mts.). It is possible that occurrences of *S. baltica* in central and southern Europe are relicts from a colder period now restricted to montane regions.

Sordaria papillata Urries, 1932: 221. — Figs. 3, 5B

Specimens examined: On dung of mouflon sheep (*Ovis musimon*) in moist chamber, Sierra Espuña (Murcia), X. Llimona, 25 Jan. 1981 (herb. Barrasa-Moreno 2289). Period of incubation three weeks.

Sordaria papillata is unique in the genus for its spores are papillate at both ends. Urries described this as 'in utroque apice papillam hyalinam c. 2 μm ferentibus' and 'la papila que llevan en cada extremo'. Lundqvist (1972: 329) investigated the type collection (MA) and found the upper papilla to be hyaline, gelatinous, c. 0.7 μm in diam., situated in the gelatinous sheath and without direct contact with the spore wall. Only with difficulty, if ever, can it be detected in dried specimens. The basal papilla is a protrusion of

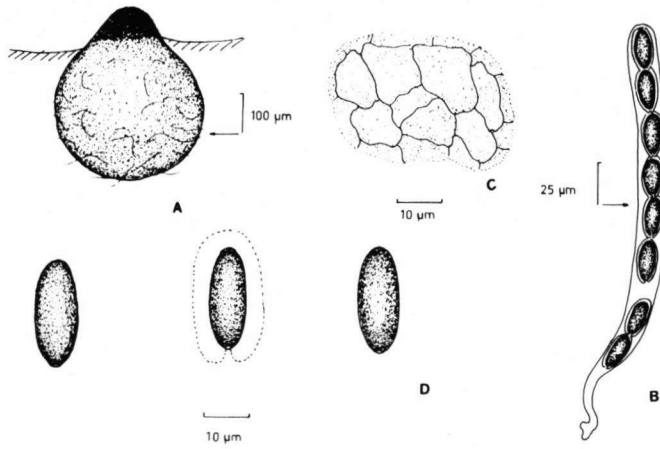


Fig. 1. *Sordaria alcina*, UPS 3343-h. — A. Perithecia. — B. Ascus. — C. Cells of peridium. — D. Spores.

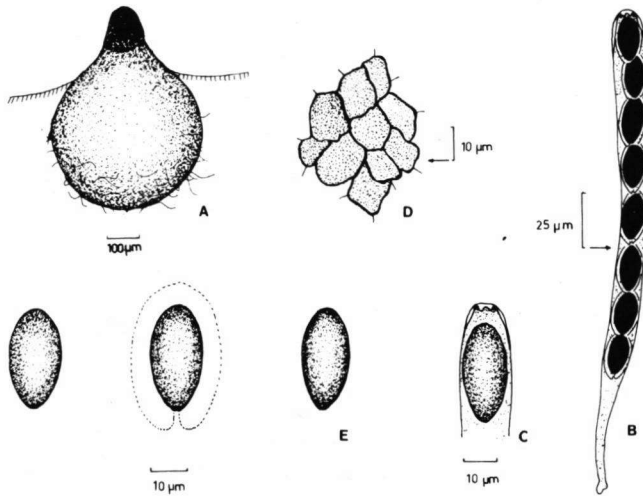


Fig. 2. *Sordaria baltica*, Barrasa & Moreno 3535. — A. Perithecia. — B. Ascus. — C. Ascus apex. — D. Cells of peridium. — E. Spores.

the wall around the germ pore, a feature present in some other *Sordariae* as well. The perithecia of the type were found to be $430\text{--}455 \times 360 \mu\text{m}$ with peridial cells $9\text{--}15 \mu\text{m}$ in diam., asci $220 \times 16 \mu\text{m}$, and spores $25\text{--}29 \times 13\text{--}14 \mu\text{m}$ with a gelatinous sheath. These observations match fairly well those by Urries, except that he overlooked the presence of the gelatinous cover.

Sordaria papillata may be confused with *S. baltica* having about the same spore size. The best diagnostic difference is the apiculate base and rounded apex of the spores in the former species. *Sordaria baltica* is also bigger in some respects.

Sordaria papillata was described for the first time on horse dung from the province of Huesca, and has not been reported since then, until Barrasa detected it on substrate from Murcia. We do not think that the difference in habitat matters much, as all the morphological characters, including the upper papilla of the spores, are in accordance with those of the original description and specimens.

Sordaria elongatispora Barrasa, Lundq. & Moreno, *spec. nov.* — Fig. 4

Perithecia semiimmersa, dispersa, ostiolata, ovoidea vel piriformia, $900\text{--}1000 \times 480\text{--}500 \mu\text{m}$, atrobrunnea. Collum eiusdem coloris, breve, cylindraceum, cellulis claviformibus, $5\text{--}6 \mu\text{m}$ latis. Venter globosus, pilis flexuosis, leviter pigmentatis, septatis, $3\text{--}4 \mu\text{m}$ latis obtectus. Peridium pseudoparenchymatum atrobrunneum, tristratum; stratum externum cellulis isodiametricis, brunneis, parietibus crassis, $14.5\text{--}16.5 \mu\text{m}$ latis; stratum medium cellulis prismaticis, leviter pigmentatis, parietibus tenuibus; stratum internum cellulis hyalinis, oblongis, parietibus tenuibus. Paraphyses non observatae. Asci unitunicati, octospori, $200\text{--}300 \times 15\text{--}20 \mu\text{m}$, cylindracei, apicibus truncatis, annulo apicali incrassato, non amyloideo. Sporae initio hyalinae, postea olivaceae, denique atrobrunneae, uniseriatae, laeves, unicellulares, $32\text{--}40 \times 12\text{--}14\text{--}(16) \mu\text{m}$, anguste ellipsoideae, in extremis subtiliter acutae, poro germinali basali instructae. Stratum gelatinosum distinctum sporam, poro excepto, cingens.

In stercore vaccino (*Bovis tauri*) in 'Sierra de Alto Rey' (Guadalajara), *J. M. Barrasa & G. Moreno*, 6-II-1982 (herb. Barrasa - Moreno 3194, holotypus).

Perithecia semiimmersed, isolated, ostiolate, ovoid to pyriform, $900\text{--}1000 \times 480\text{--}500 \mu\text{m}$, dark brown to black, subglobose, with flexuous, weakly pigmented, septate, $3\text{--}4 \mu\text{m}$ thick hairs. Neck dark brown to black, short, cylindrical, with claviform, $5\text{--}6 \mu\text{m}$ broad cells. Peridium pseudoparenchymatous, dark brown, 3-layered: outer layer with isodiametric, thick-walled, brown cells, $14.5\text{--}16.5 \mu\text{m}$ in diam.; middle layer with weakly pigmented, prismatic, thin-walled cells; inner layer with hyaline, thin-walled and flattened cells. Paraphyses not seen. Asci 8-spored, unitunicate, cylindrical, $200\text{--}300 \times 15\text{--}20 \mu\text{m}$ with a truncate apex and apical non-amyloid ring. Spores at first hyaline, then ranging through yellow to olivaceous and finally dark brown, narrowly ellipsoidal with somewhat acute ends, $32\text{--}40 \times 12\text{--}14\text{--}(16) \mu\text{m}$, obliquely uniseriate, smooth, one-celled, with a basal germ pore and a gelatinous sheath.

Specimens examined. — On cow dung (*Bos taurus*) in moist chamber after two months of culture, Sierra de Alto Rey (Guadalajara), *J. M. Barrasa & G. Moreno*, 6 Febr. 1982 (herb. Barrasa-Moreno 3194, holotypus; isotypus in S).

Sordaria elongatispora deviates from all other *Sordaria* species by its very long and narrow spores. The closest relative seems to be the smaller *S. baltica*, which has the same kind of spores with tapering ends. The difference in size makes them easy to separate.

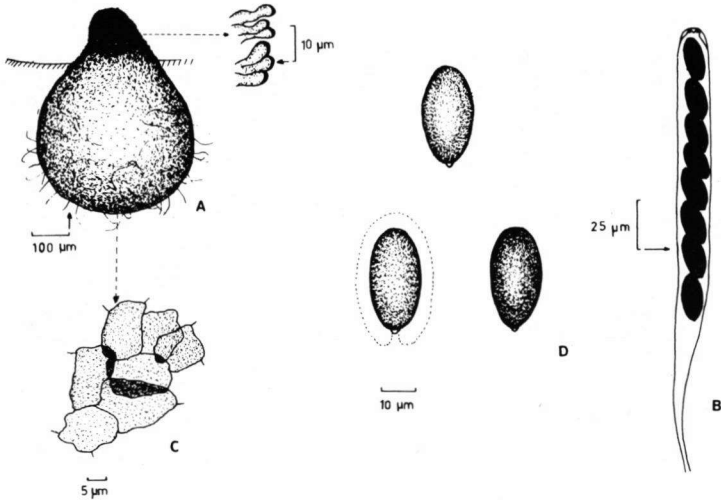


Fig. 3. *Sordaria papillata*, Barrasa & Moreno 2289. — A. Perithecia. — B. Asci. — C. Cells of peridium. — D. Spores.

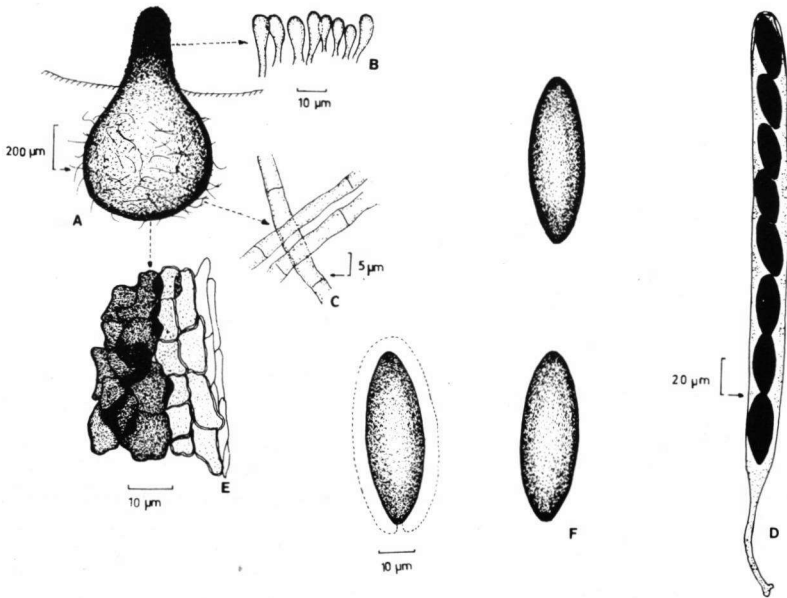


Fig. 4. *Sordaria elongatispora*, holotypus. — A. Perithecia. — B. Neck cells. — C. Hairs of perithecia. — D. Asci. — E. Cells of peridium. — F. Spores.

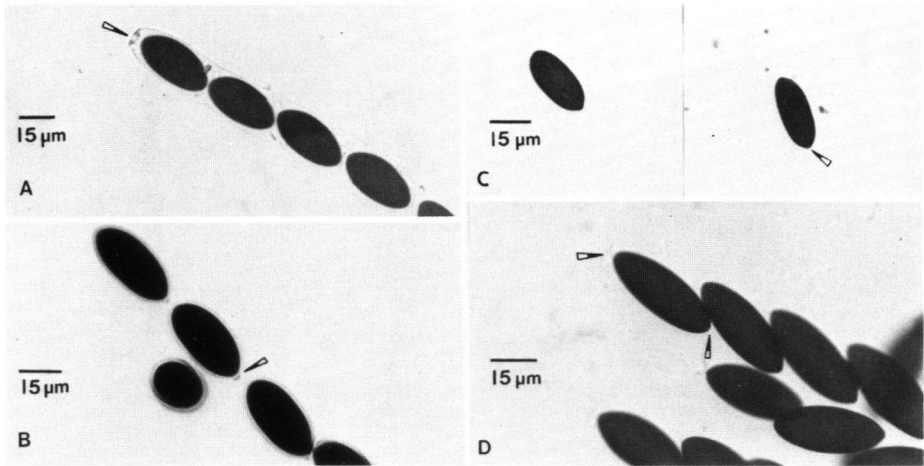


Fig. 5. — A. Spores of *Sordaria baltica*, Barrasa & Moreno 3535. — B. Spores of *S. papillata*, Barrasa & Moreno 2289. — C. Spores of *S. alcina*, UPS 3343-h. — D. Spores of *S. elongatispora*, holotypus.

KEY TO THE NARROW-SPORED SORDARIA SPECIES

(spores with a length/width ratio > 1.8)

1. Spores with rounded apex and tapering base.
 2. Spores $25-29 \times 13-14 \mu\text{m}$ with apiculate germ pore; $L/W = 1.8-2.2$ *S. papillata*
 2. Spores $21-26 \times 9.5-12 \mu\text{m}$ with non-apiculate germ pore; $L/W = 2.0-2.5$ *S. alcina*
1. Spores tapering at both ends.
 3. Spores $25-31 \times 12-14 \mu\text{m}$; $L/W = 2.0-2.5$ *S. baltica*
 3. Spores longer $32-40 \times 12-14.5(-16) \mu\text{m}$; $L/W = 2.4-3.3$ *S. elongatispora*

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