

## COPROPHILOUS ASCOMYCETES FROM NORTHERN SPAIN.

BY

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At the end of April and beginning of May 1959 a botanical excursion to northern Spain was undertaken from the Institute of Systematic Botany of the University of Uppsala. The main purpose was to get a general knowledge of the flora and vegetation of the area visited.

Since I am at present studying the coprophilous fungi of Sweden I used the opportunity to procure some Spanish material for comparison. Thus 13 gatherings of dung were brought home for study.

All species treated below, except *Poronia punctata*, developed on dung kept in a moist chamber in our laboratory. Of course, all kinds of coprophilous fungi appeared, but for several reasons I shall treat only the Ascomycetes in this paper. About 15 species from other groups of fungi are omitted: 4 Hyphomycetes, 3 Phycmycetes, 1 Myxomycete and 7 Basidiomycetes. Species of the first two groups may originate either from primary or secondary infection. The fimicolous Ascomycetes, however, have no air-borne spores, and undoubtedly the species developed in my cultures are of Spanish origin.

The list of Ascomycetes is not complete since there were several species difficult to identify or specimens deviating markedly from the "normal" appearance of certain species. They need a thorough analysis and must be left for a future publication.

### Earlier reports of coprophilous Ascomycetes from Spain.

In his paper "Ascomycetos de la península Ibérica" UNAMUNO (1941) gave a fairly complete list of the Ascomycetes reported from the Iberian Peninsula and the Balearic Islands up to 1940. There is no compiled list of later statements. I have searched intensively for

such later reports, mainly in the Spanish publications, but some species have possibly been overlooked. Sixteen coprophilous Ascomycetes seem to be known from Spain so far, viz.:

*Bombardioidea bombardioides* (AWD) C. MOREAU. Huesca: Barbuñales. Rabbit dung.

*Chaetomium comatum* (TODE) FR. Madrid: Bot. Garden. Paper.

*Hypocropa merdaria* (FR.) FR. Navarra: Tudela. Sheep dung.

*Poronia punctata* (L. ex FR.) FR. Almería: Sierra de Gádor; Andalucía; Aragón: Molina; Castilla la Nueva; Cataluña: "Pi de los Tres Branques." Cow dung.

Logroño: Torrecilla; Teruel: Castelserás; Valencia.

*Sordaria brefeldii* ZOPF. Huesca: Barbuñales. Rabbit dung.

*S. papillata* URRÍES. Huesca: Barbuñales. Horse dung.

*Sporormia dakotensis* GRIFF. Huesca: Barbuñales. Rabbit dung.

*S. intermedia* AWD. Huesca: Barbuñales. Rabbit and horse dung; Navarra: Tudela. Sheep dung.

*S. kansensis* GRIFF. Huesca: Barbuñales. Rabbit dung.

*Ascobolus glaber* PERS. ex FR. Almería: Valley of Nacimiento, alt. 2500 m. Cow dung.

*Ascophanus cinereus* BOUD. (Without a locality.) Wood and rotten twigs.

*Cheilymenia aurea* (PERS. ex FR.) BOUD. Barcelona: Prat de Llobregat.

*Ch. stercorea* (PERS. ex FR.) BOUD. Asturias; Navarra: Valle de Vertizarana; Teruel: Castelserás. Horse, cow and human dung.

*Peziza cerea* SOW. ex FR. Madrid: Bot. Garden, Casa de Campo; Segovia: San Ildefonso. Dung.

*P. saccardiana* COOKE. Castilla. Dung and manured ground.

*P. vesiculosa* BULL. ex FR. Andalucía: Río Genil. Castilla la Nueva; Cataluña: in the Pyrenées; Madrid: El Escorial, Casa de Campo; Santander; Teruel: Castelserás. Dung or manured ground.

According to MOREAU 1953, p. 112, *Sordaria brefeldii* probably is a *Hypocropa*, but he has not seen ZOPF's original description and does not formally make a new combination. *Bombardioidea bombardioides* and *Cheilymenia stercorea* are reported under the names of *Sordaria maxima* NIESSL and *Lachnea stercorea* (PERS. ex FR.) GILL., respectively.

All Pyrenomycetes except *Poronia punctata* have been collected and determined by URRÍES Y AZARA, a well-known mycologist. The Discomycetes have been identified by various other persons, and the determinations are perhaps not always reliable.

### Coprophilous Ascomycetes collected by me in 1959.

The kind of dung has sometimes been difficult to state. In several cases I could not establish the difference between sheep and goat  
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dung, and between horse and donkey dung. I think gathering no. 4 is roe deer dung, and so is perhaps gathering no. 5.

The names of many species given here are not quite definite nomenclaturally. I have been rather conservative and used the names most commonly accepted. Also from a taxonomical point of view further studies are often required. Regarding certain Sphaeriales I have followed MOREAU (1953) and MUNK (1957).

#### List of localities.

1. GUIPÚZCOA, c. 2 km W. of Villabona (= c. 15 km SSW. of San Sebastian). Limestone hill with oaks. 27.IV. 1959. Sheep or goat dung. No. 1840.

*Pleurage curvula*, *Ascobolus immersus*.

2. ASTURIAS, the sea-coast between Cabo Prieto and Cabo de Mar, c. 2 km NW. of Posada (= c. 10 km W. of Llanes). On the shore. 29.IV. 1959. Sheep or goat dung. No. 1865.

*Pleurage anserina*, *P. curvula*, *P. decipiens*, *P. setosa*, *Sordaria fimicola*, *Sporormia intermedia*, *S. megalospora*, *Ascobolus immersus*, *Ascophanus carneus*, *Ryparobius sexdecimsporus*.

3. The same locality as coll. 2. Horse or donkey dung. No. 1866.

*Bombardia coerulea*, *Coniochaeta leucoplaca*, *C. ligniaria*, *C. scatigena*, *Hypocpra equorum*, *Pleurage curvula*, *P. decipiens* (incl. *pleiospora*), *P. dubia*, *P. minuta*, *P. vestita*, *Lasiobolus equinus*.

4. ASTURIAS, Covadonga, c. 2 km N. of the Santuario. Alt. c. 500 m. 1.V. 1959. Roe deer dung. No. 1894.

*Delitschia canina*, *D. marchalii*, *D. winteri*, *Hypocpra merdaria*, *Pleurage curvula*, *P. decipiens*, *Sporormia intermedia*, *Lasiobolus equinus*.

5. ASTURIAS, Covadonga, c. 2 km W. of the Santuario. Alt. c. 500 m. In a meadow. 1.V. 1959. Roe deer dung? No. 1895.

*Coniochaeta leucoplaca*, *C. ligniaria*, *Pleurage curvula*, *P. decipiens*, *Sporormia ambigua*, *S. intermedia*, *Trichodelitschia bisporula*, *Zygosporella setosa*, *Ascophanus glaucellus*, *Lasiobolus equinus*, *Ryparobius sexdecimsporus*.

6. ASTURIAS, Covadonga, c. 3 km W. of the Santuario. Alt. c. 600 m. 1.V. 1959. Goat dung. No. 1896.

*Pleurage curvula*, *P. decipiens*, *P. minuta*, *P. minuta* f. *tetraspora*, *Selinia pulchra*, *Sordaria fimicola*, *Sporormia intermedia*, *Ascophanus carneus*.

7. ASTURIAS, Cabo Peñas (c. 20 km NW. of Gijón). Grazed heath with small *Erica* and *Ulex* near the lighthouse. 3.V. 1959. Rabbit dung. No. 1907.

*Coniochaeta ligniaria*, *Delitschia canina*, *D. winteri*, *Hypocopra merdaria*, *Pleurance decipiens*, *P. minuta*, *P. minuta* f. *tetraspora*, *Sporormia intermedia*, *S. megalospora*, *Trichodelitschia bisporula*, *Ascophanus argenteus*.

8. The same locality as coll. 7. Cow dung. No. 1908.

*Pleurance anserina*, *P. curvula*, *P. decipiens*, *P. fimiseda*, *P. minuta*, *P. vestita*, *Sporormia minima*, *Ascobolus immersus*, *Ascophanus argenteus*, *A. carneus*, *Ryparobius sexdecimsporus*, *Saccobolus kervernii*.

9. ASTURIAS, Puerto de Pajares, just S. of the Parador. In the *Erica arborea* zone. Alt. c. 1365 m. Cow dung. No. 1914.

*Coniochaeta ligniaria*, *C. scatigena*, *Delitschia didyma*, *D. furfuracea*, *D. winteri*, *Pleurance curvula*, *P. decipiens*, *P. minuta*, *P. pilosa*, *Sporormia intermedia*, *S. megalospora*, *S. minima*, *Trichodelitschia bisporula*, *Lasiobolus equinus*.

10. The same locality as coll. 9. Horse or donkey dung. No. 1915.

*Coniochaeta ligniaria*, *C. scatigena*, *Pleurance appendiculata*.

11. PALENCIA, c. 2 km NE. of Quintana del Puente (= c. 30 km ENE. of Palencia). 7.V. 1959. Sheep dung. No. 1943.

*Kernia nitida*, *Chaetomium comatum*, *Pleurance anserina*, *P. decipiens*, *P. minuta*, *Selinia pulchra*, *Sporormia intermedia*.

12. BURGOS, at the crossroad c. 10 km WSW. of Miranda de Ebro. In an arable field. Horse or donkey dung. No. 1944.

*Coniochaeta ligniaria*, *Delitschia furfuracea*, *Pleurance curvula*, *P. decipiens*, *Poronia punctata*, *Sporormia intermedia*.

13. GUIPÚZCOA, Valley of Río Agunza, c. 5 km SSW. of Tolosa (c. 25 km SSW. of San Sebastian). Horse or donkey dung. No. 1966.

*Pleurance curvula*.

#### List of species.

The following list gives alphabetically the species collected. The numbers without the parentheses, from 1 to 13, indicate the localities as above; the numbers in the parentheses are the herbarium numbers of the specimens preserved (in UPS). For brevity the word "dung" is omitted after "horse", "sheep", etc. Thus, "3, 10 (1915*b*), 12 horse or donkey" means that the species is found on horse or donkey dung from the localities 3, 10 and 12, and that material has been kept from locality 10 and given number 1915*b*.

*Plectascales.*

*Kernia nitida* (SACC.) NIEUW. (= *Magnusia nitida* SACC.). — 11 (1943e) sheep.

*Pyrenomyces.*

*Bombardia coerulea* (PETCH) CAIN. — 3 (1866j) horse or donkey.

*Chaetomium comatum* (TODE) FR. — 11 (1943b) sheep.

*Coniochaeta leucoplaca* (BERK. & RAV.) CAIN. — 3 (1866f) horse or donkey, 5 (1895e) roe deer?

*C. ligniaria* (GREV.) MASSEE [= *C. discospora* (AWD) CAIN]. — 3, 10 (1915b), 12 horse or donkey, 5 (1895h) roe deer?, 7 rabbit, 9 cow.

*C. scatigena* (BERK. & BR.) CAIN. — 3 horse or donkey, 9 cow, 10 (1915d) horse or donkey.

*Delitschia canina* MOUT. — 4 (1894f) roe deer, 7 (1907g) rabbit.

*D. didyma* AWD. — 9 (1914d) cow.

*D. furfuracea* NISSL. — 9 (1914e) cow, 12 (1944b) horse or donkey.

*D. marchalii* BERL. & VOGL. — 4 (1894d) roe deer.

*D. winteri* PHILL. & PLOWR. — 4 (1894c) roe deer, 7 (1907d) rabbit, 9 cow.

*Hypocopa equorum* (FUCK.) WINT. — 3 (1866k) horse or donkey.

*H. merdaria* (FR.) FR. — 4 (1894b) roe deer, 7 (1907f) rabbit.

*Pleurage anserina* (CES.) KUNTZE. — 2 sheep or goat, 8 cow, 11 (1943h) sheep.

*P. appendiculata* (AWD) C. MOREAU. — 10 (1915c) horse or donkey.

*P. curvula* (DE BARY) KUNTZE. — 1 (1840b), 2 (1865f) sheep or goat, 3, 12, 13 horse or donkey, 4 roe deer, 5 roe deer?, 6 (1896c) goat, 8, 9 cow.

*P. decipiens* (WINT.) KUNTZE (incl. *P. pleiospora* WINT.). — 2 sheep or goat, 3, 12 horse or donkey, 4 roe deer, 5 roe deer?, 6 goat, 7 rabbit, 8, 9 cow, 11 sheep.

*P. dubia* (HANS.) C. MOREAU. — 3 (1866d) horse or donkey.

*P. fimiseda* (CES. & DNOT.) GRIFF. — 8 cow.

*P. minuta* (FUCK.) KUNTZE. — 3 horse or donkey, 6 goat, 7 (1907e) rabbit, 8, 9 cow, 11 (1943f) sheep.

*P. minuta* f. *tetraspora* (WINT.) C. MOREAU. — 6 goat, 7 (1907b) rabbit.

*P. pilosa* (MOUT.) C. MOREAU. — 9 (1914g) cow.

*P. setosa* (WINT.) KUNTZE. — 2 sheep or goat.

*P. vestita* (ZOPF) GRIFF. — 3 (1866h) horse or donkey, 8 cow.

*Poronia punctata* (L. ex FR.) FR. — 12 (1944a) horse or donkey.

*Sordaria pulchra* (WINT.) KARST. — 6 (1896b) goat, 11 (1943a) sheep.

*Sordaria fimicola* (ROB.) CES. & DNOT. — 2 (1865d) sheep or goat, 6 goat.

*Sporormia ambigua* NISSL. — 5 (1895d) roe deer?

*S. intermedia* AWD. — 2 sheep or goat, 4 (1894a) roe deer, 5 roe deer?, 6 goat, 7 rabbit, 9 (1914l) cow, 11 sheep, 12 horse or donkey.

*S. megalospora* AWD. — 2 (1865h) sheep or goat, 7 (1907c) rabbit, 9 (1914i) cow.

*S. minima* AWD. — 8 (1908f), 9 (1914c) cow.

*Trichodelitschia bisporula* (CR.) MUNK [= *Delitschia b.* (CR.) HANS.]. — 5 roe deer?, 7 (1907a) rabbit, 9 (1914b) cow.

*Zygospermella setosa* CAIN. — 5 (1895i) roe deer?

*Discomycetes.*

- Ascobolus immersus* PERS. ex FR. — 1 (1840*a*), 2 sheep or goat, 8 cow.  
*Ascophanus argenteus* (CURR.) BOUD. — 7 rabbit, 8 (1908*c*) cow.  
*A. carneus* (PERS. ex FR.) BOUD. — 2 (1865*e*) sheep or goat, 6 (1896*a*) goat, 8 (1908*a*) cow.  
*A. glaucellus* REHM. — 5 (1895*j*) roe deer?  
*Cheilymenia stercorea* (PERS. ex FR.) BOUD. — Collected by R. Santesson on probably manured ground c. 4 km N. of Covadonga. Alt. c. 400 m. Specimen preserved.  
*Lasiobolus equinus* (MÜLL.) KARST. — 3 horse or donkey, 4 roe deer, 5 (1895*g*) roe deer?, 9 cow.  
*Ryparobius sexdecimsporus* (CR.) SACC. — 2 sheep or goat, 5 (1895*b*) roe deer?, 8 (1908*b*) cow.  
*Saccobolus kervernii* (CR.) BOUD. — 8 (1908*e*) cow.

Of the 39 Ascomycetes collected, all are new to these parts of Spain, and 35 species are new to the country, viz. 27 Pyrenomycetes, 7 Discomycetes and 1 Plectascales.

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