A GUIDE TO THE CLASSIFICATION OF FIMICOLOUS *PEZIZALES* IN ITALY.

CONTRIBUTION TO THE STUDY OF FIMICOLOUS FUNGI – XXXII.

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Abstract

The authors provide very detailed information about the systematic changes which recently involved the fimicolous ***Pezizales*** and caused, besides, the transfer of family ***Thelebolaceae*** from this order to another not yet well identified but placeable among the bitunicate ***Ascomycota***. After having outlined by a dichotomous key the Italian fimicolous species belonging to ***Pezizales*** and ***Thelebolaceae***, the authors describe in detail the morphological features of ***taxa*** with which they had not dealt in their contributions on fimicolous fungi. But as regards the species described in the previous articles, only the synonyms and data concerning the studied material are supplied.

INTRODUCTION

Our mycological occupation, fully devoted to the study and census of fimicolous fungi in Italy, could not leave out of consideration the treatment of the species belonging to the order ***Pezizales*** Bessey, many of which regularly colonize the excrements of most, both domestic and wild, herbivores, and sporadically of some carnivores.
Let us make it clear that our systematics fully agrees with the *Systema Ascomycetum* (Eriksson & Hawksworth 1993; 1998), a work essential in collecting and setting up researches and new onto- and phylogenetic theories with consequent nomenclatural specifications or changes.
In 1993 (Eriksson & Hawksworth, *l.c.*) the systematic rearrangement of order ***Pezizales*** drew its inspiration from a Kimbrough's article (1989) by which three suborders were established and defined: 1) ***Sarcoscyphineae*** Rifai, characterized by suboperculate asci and subdivided into families and genera whose representatives usually are not fimicolous; 2) ***Pyronemineae*** Kimbr., distinguishable by a gymnohymenial ontogeny (hymenium exposed ever since the early developmental stages) and operculate asci, with dehiscence arising from exoascal layer. Both families in which they were subdivided (***Ascodesmidiaceae*** J. Schröt. and ***Pyronemataceae*** Corda) contained a few prevalently or even exclusively fimicolous genera (***Ascodesmis*** Tiegh. the former, ***Coprotus*** Korf ex Korf & Kimbr. and ***Dictyocoprotus*** Krug & Khan the latter); 3) ***Pezizineae*** Rifai, provided with operculate asci, but with dehiscence arising from the endoascal layer and cleistohymenial ontogeny [hymenium exposed in a later stage (mesohymenial or telohymenial)]. Many families [***Ascobolaceae*** Boud. ex Sacc.; ***Otideaceae*** Eckblad; ***Pezizaceae*** Dumort.; ***Thelebolaceae*** (Brumm.) Eckblad] and genera placeable in this latter suborder can be considered, at least partly, fimicolous.

After Korf & Zhuang (1991b) practically all the genera which in the past belonged to the ***Humariaceae*** Velen. (this family was synonymized as its name was invalidly published) were arranged in the ***Otideaceae*** together with other exclusively fimicolous genera, as ***Lasiobolus*** Sacc. and ***Trichobolus*** (Sacc.) Kimbr. & Cain in Kimbr. & Korf.
Since 1993 till now many works on the genetics of ***Pezizales*** have been published, some of which turn out decisive for placing the family ***Thelebolaceae*** outside the limits of this order. Particularly Momol & Kimbrough (1994) proved that ***Thelebolus*** Tode has not affinity with any selected genus of ***Pezizales,*** on the contrary the phylogeny of this ***taxon*** and the morphology of the ascomata (light coloured cleistothecia, usually bitunicate asci with an explosive dehiscence) are close to a Loculoascomycetes (? ***Erysiphales*** Gwynne-Vaughan). These results have been confirmed by Landvik *et al.* (1997) and a van Brummelen's research (1998) on the ascus ultrastructure in ***Thelebolaceae***.
The latest "*Outline of the Ascomycetes*" (Eriksson & Hawksworth, 1998) held in great consideration van Brummelen's (in Dissing & Schumacher, 1994) suggestion to transfer into ***Thelebolaceae*** ***Ascophanus*** Boud., ***Ascozonus*** (Renny) E. C. Hansen and ***Leptokalpion*** Brumm. from ***Ascobolaceae***, ***Coprotus*** from ***Pyronemataceae*****,** ***Lasiobolus*** and ***Trichobolus*** from ***Otideaceae***, as in these genera the structure and functioning of the asci are similar to ***Thelebolus***.
Ultrastructural studies carried out by Curry & Kimbrough (1983) and Kimbrough & Curry (1985) proved a clear likeness between ***Iodophanus*** Korf and ***Pezizaceae***, confirmed by the same kind of anamorphous and sporal ornamentation. So the tranfer of ***Iodophanus*** from ***Ascobolaceae*** to ***Pezizaceae*** turns out an obvious operation (Eriksson & Hawksworth, 1998).
The confirmation of ***Chalazion*** Dissing & Sivertsen among the ***Pezizales*** of " *incertae sedis* " is the last measure which we must mention (van Brummelen in Dissing & Schumacher, *l.c.*).
To conclude our introduction, certainly we can state that a great many fimicolous representatives of both the current ***Pezizales*** and families (***Thelebolaceae***) recently transferred from this order are present in Italy. Their systematic arrangement can be illustrated as follow (pl. 1):

Pezizales Bessey	***Ascobolaceae*** Boud. ex Sacc.	***Ascobolus*** Pers. ***Saccobolus*** Boud. ***Thecotheus*** Boud.
	Ascodesmidaceae J. Schröt.	***Ascodesmis*** Tiegh.
	Otideaceae Eckblad	***Cheilymenia*** Boud. ***Pseudombrophila*** Boud. ***Trichophaea*** Boud.
	Pezizaceae Dumort.	***Iodophanus*** Korf ***Peziza*** Fr.
	Pyronemataceae Corda	no genus represented in Italy
	Incertae sedis	***Chalazion*** Dissing & Sivertsen
? Erysiphales Gwynne-Vaughan	***Thelebolaceae*** (Brumm.) Eckblad	***Coprotus*** Korf ***Lasiobolus*** Sacc. ***Ascozonus*** (Renny) E. C. Hansen ***Thelebolus*** Tode ***Trichobolus*** (Sacc.) Kimbr. & Cain

Plate1 Systematic subdivision of fimicolous *Pezizales* and *Thelebolaceae* in Italy.

MATERIALS AND METHODS

For this study we adopted the methodology which allowed us to obtain satisfactory results in some previous works. As for the details, we refer to two recently published articles of our own (Cacialli et al., 1998 a; 1998 b), while in this occasion we wish to remind that spore size was calculated in water and at least thirty spores for each specimen were measured, excluding their possible ornamentations (warts, tubercles, etc.). These latter were highlighted by cotton blue, which together with Congo red turned out very useful to the examination of the ***excipulum***.
For each collection we have calculated the spore Q (length/width ratio), whose both middle and extreme values were reported in the specific part of this work, while only the middle values were reported in dichotomous key.

Dichotomous key of fimicolous *Pezizales* and *Thelebolaceae* in Italy

[**N. B.** This key has drawn its inspiration from Dennis, 1981 (general part); Hohmeyer, 1986 (genus ***Peziza***); Denison, 1964 - Korf & Zhuang, 1991 - Yao & Spooner, 1996 (genus ***Cheilymenia***); van Brummelen, 1981 (genus ***Ascodesmis***), van Brummelen, 1995 (genus ***Pseudombrophila***); van Brummelen, 1967 (genera ***Ascobolus*** and ***Saccobolus***); Aas, 1992 (genus ***Thecotheus***); Aas, 1983 - Kimbrough et al., 1972 (genus ***Coprotus***); Bezerra & Kimbrough, 1975 (genus ***Lasiobolus***). It includes only the species which we have personally studied, except ***Trichophaea subalpina*** (***fide*** Jamoni, 1998)]

1) Asci usually narrowly cylindrical, operculate, 8-spored, not protruding when ripe above the general level of the hymenium. Spores uniseriate with rare exceptions. ***2***

1a) Asci cylindric-claviform, clavate or saccate, exceptionally cylindrical (in such a case spores uniseriate), operculate (but sometimes with a non-functional operculum) or dehiscing by a split, 8- polyspored, protruding when ripe. Spores biseriate or conglobate. ***20***

2) Ascomata glabrous, more than 10 mm diam. Asci amyloid with very few exceptions. (***Pezizaceae p.p.***) ***3***

2a) Ascomata hairy, smaller (usually 1-10 mm). Asci non-amyloid. (***Otideaceae p.p.***) ***6***

3) Spores ornamented with punctiform warts and/or short and low ridges. ***4***

3a) Spores smooth. ***5***

4) Apothecia stipitate. Spores 14.1-15.7 x 6.8-7.8 µm (13-16.5 x 6.5-7.5 sec. Hohmeyer, *l.c.*). (1) ***Peziza perdicina***

4a) Apothecia sessile. Spores 17.1-18 x 8.5-9 µm (15-18 x 7-8.5 sec. Hohmeyer, *l.c.*). (**2) *Peziza merdae***

5) Apothecia comparatively small (up to 20 mm diam.), in the shape of a shallow cup which turns to flatten. Hymenial surface more or less even. Spores 20-22.5 x 10-11.7 µm (19-22 sec. Hohmeyer, *l.c.*). Excipulum 2-layered (*textura globulosa*). (3) ***Peziza fimeti***

5a) Apothecia larger (even more than 100 mm), deeply cupulate and scarcely flattening. Hymenial surface vesicular. Spores 20-21.6 x 11.2-12.6 µm (20-24 x 10-14 µm sec. Hohmeyer, *l.c.*). *Excipulum* 5-layered (middle layer of a *textura intricata*). (4) ***Peziza vesiculosa***

6) Apothecia discoidal or turbinate, rarely cup-shaped, brightly coloured with various yellow, orange and red shades. Paraphyses containing carotenoid pigments. Hairs (setae) mostly rooting. ***7***

6a) Apothecia often cup-shaped, sessile or shortly stalked, turning to flatten when ripe, usually with brown shades. Paraphyses without carotenoid pigments. Hairs usually superficial. ***15***

7) Spores guttulate, hyaline, not turning refractive yellowish when stained in Cotton blue in lactic acid, without a loosening perisporium (***Scutellinia***), 17.8-21 x 11.5-13.6 µm. Hairs dark brown, often more than 1000 µm high. (**5**) ***Scutellinia crinita***

7a) Spores without oil drops, refractive yellowish in Cotton blue. Perisporium easily loosening. Hairs usually paler and less than 1000 µm high. (***Cheilymenia***) ***8***

8) Hairs often not visible to the naked eye, hyaline or light yellowish , thin-walled. Spores with longitudinal cyanophile striae. *Medulla* of a *textura globulosa-angularis*, not- or scarcely differentiated from the ectal *excipulum*. ***9***

8a) Hairs usually visible also to the naked eye, dark yellow to yellowish-brown or dark brown, comparatively thick-walled. Spores smooth, sometimes with sparse thin warts, ridges or an incomplete reticulum. *Medulla* scarcely to well differentiated. ***10***

9) Apothecia subglabrous, orange-apricot. Hairs hyphoid: superficial, hyaline, bulbous at the base. Spores 16-18 x 8-9 µm. Paraphyses strongly enlarged at the apex. (6) ***Cheilymenia granulata***

9a) Apothecia hairy, yellow. Hyphoid hairs placed beside acuminate and yellowish hairs, which appear furcate at the base and subrooting. Spores 16-20 x 7-9 µm (16-19.5 x 8.5-10.5 sec. Yao & Spooner, *l.c.*). Paraphyses not- or slightly enlarged at the apex.
(7) ***Cheilymenia theleboloides***

10) Lateral hairs superficial, stellate. Marginal hairs straight (setae), often multifurcate at the base, rooting. Spores 15.3-17.1 x 8.1-8.5 µm (14-18 x 8-10 sec. Denison, *l.c.*).
(8) ***Cheilymenia stercorea***

10a) Stellate hairs absent. ***11***

11) Apothecia discoidal when ripe, 2-5 mm diam. Marginal hairs rooting. *Medulla* of a *textura intricata*. ***12***

11a) Apothecia turbinate or subcylindrical, smaller (0.2-2 mm). Marginal hairs superficial. *Medulla* of a *textura globulosa-angularis*. ***14***

12) Apothecia bright orange. Marginal hairs often with a multifurcate base, even more than 500 µm long, very thick-walled (4-6 µm). Spores 16.8-18.3 x 9.4-10.5 µm (14.5-18 x 8-9.5 sec. Yao & Spooner, *l.c.*). **(9) *Cheilymenia coprinaria***

12a) Apothecia reddish. Marginal hairs simple or bifurcate, not any more than 500 µm long, with thiner walls (1-4 µm). ***13***

13) Marginal hairs very sparse. Spores subglobous or broadly ellipsoidal (Q= 1.22), 14-16.8 x 11.5-13.6 µm (16.5-19.5 x 12-13.5 sec. Moravec, 1988. **(10) *Cheilymenia fraudans***

13a) Marginal hairs quite dense. Spores ellipsoidal (Q= 1.72), 16.2-17.8 x 9.4-11 µm (16.5-21 x 9-11 sec. Moravec, 1989). **(11) *Cheilymenia rubra***

14) Apothecia deep yellow-orange. Spores 21-24.5 x 12-13.5 µm (18-25.5 x 12-14.5 sec. Moravec, 1992). (12) ***Cheilymenia pulcherrima***

14a) Apothecia orange-red. Spores 19-21.5 x 11-12.5 µm (15-20 x 9-12 sec. Thind & Kaushal, 1980). (13) ***Cheilymenia aurantiacorubra***

15) Spores with large oil drops. Hairs pointed, straight, stiff (setae). (***Trichophaea***) ***16***

15a) Ripe spores without oil drops. Hairs obtuse, often clustered or hyphoid. (***Pseudombrophila***) ***17***

16) Hairs often fasciculate, rooting or with a truncate base. Spores narrowly ellipsoidal to fusiform, finely warted, 20-24.5 x 11-12 µm. **(14) *Trichophaea gregaria***

16a) Hairs not fasciculate, with a bulbous base. Spores ellipsoidal, smooth, 15-18 x 8.5-10 µm. (15) ***Trichophaea subalpina***

17) Apothecia very small, up to 0,8 mm diam. Hymenial surface whitish. Spores 15.7-16.8 x 9.4 µm (14.3-18.3 x 8.7-10 sec. van Brummelen, *l.c.*), ellipsoidal (Q= 1.75).
(16) *Pseudombrophila minuta*

17a) Apothecia larger. Hymenial surface pigmented (but see also the observations about ***P. merdaria***). ***18***

18) Spores 12.6-14.1 x 7.3-8.4 µm (10.3-13.5 x 6.2-8.3 sec. van Brummelen, *l.c.*), ellipsoidal (Q= 1.67). Paraphyses enlarged at the apex. Asci 110-130 µm long. **(17) *Pseudombrophila merdaria***

18a) Spores more than 15 µm long, narrowly ellipsoidal or subfusiform (Q > 1.80). Asci larger. Paraphyses not- or slightly enlarged at the apex. ***19***

19) Spores 16.8-20.4 x 8.4-9.4 µm (14.4-18.7 x 7-9.3 sec. van Brummelen, *l.c.*), Q= 2.06. Asci up to 180 µm long. **(18) *Pseudombrophila cervaria***

19a) Spores 20.5-23 x 11.5-12.5 (21-22.3 x 11-11.7 sec. van Brummelen, *l.c.*), Q= 1.83. Asci 200-250 µm long. **(19) *Pseudombrophila fuscolilacina***

20) Asci amyloid. (***Ascobolaceae* + *Iodophanus***) ***21***
20a) Asci non-amyloid. ***49***

21) Hymenial surface dark papillate or dotted. Spores pigmented. ***22***
21a) Hymenial surface more or less papillate or dotted but not dark. Spores hyaline. ***43***

22) Ascomata superficial or semi-immersed in the substratum, sessile or sometimes shortly stipitate, 0.2-10 (30) mm diam., pyriform, turbinate, cup-shaped, exceptionally discoidal when ripe. Spores free inside the ascus. (***Ascobolus***) ***23***
22a) Ascomata superficial, sessile, 0.2-1 (2) mm diam., discoidal, lenticular or pulvinate when ripe. Spores crowded and cemented inside the ascus, arranged according to a well definite scheme. (***Saccobolus***) ***34***

23) Ascomata very small (usually < 0.8 mm wide and high), pyriform, subglobous, turbinate sometimes immersed. Hymenial surface exposed only during a late phase ("*telohymenial"* phase sec. van Brummelen, *l.c.*). [sect. ***Dasyobolus*** (Sacc.) Brumm.] ***24***
23a) Ascomata larger (up to 10 mm, rarely less than 0.5 mm wide), superficial, usually cup-shaped (stipitate or sessile) and turning to flatten when ripe. Hymenial surface precociously exposed (*"prohymenial"* or *"mesohymenial"* phase sec. van Brummelen, *l.c*.). ***28***

24) Ascomata immersed. ***25***
24a) Ascomata superficial. ***26***

25) Ascomata erumpent when ripe. Spores very large, 55.8-63 x 31.5-37.8 µm (58-71 x 28-36 *sec.* van Brummelen, *l.c*.). Episporium smooth, sometimes finely lined. Asci broadly clavate or saccate. (20) ***Ascobolus immersus***
25a) Ascomata not erumpent (only the asci exposed). Spores smaller, 25.7-28.3 x 16.8-17.8 µm (26.5-30.5 x 16-17.5 *sec.* van Brummelen, *l.c.*). Episporium warted. Asci clavate or clavate-sacciform. (21) ***Ascobolus stictoideus***

26) Spores comparatively small, 14.7-16.8 x 8.4-10.5 µm (18.5-21 x 10-11.5 *sec.* van Brummelen, *l.c.*). Episporium warted. (22) ***Ascobolus hawaiiensis***
26a) Spores larger. Episporium finely dotted or cracked, with fine or coarse, often anastomosed cracks, which build up an almost complete reticulum. ***27***

27) Spores 21-24 x 11-12 µm (19-23 x 10-12 *sec*. van Brummelen, *l.c*.). (23) ***Ascobolus mancus***
27a) Spores 28.3-31.5 x 12.0-13.6 µm (23-29 x 11.5-17.5, *sec.* van Brummelen, *l.c.*).(24) ***Ascobolus elegans***

28) Ascomata 0.25-0.55 mm wide. Spores globous, ornamented with roundish warts or truncate tubercula, 11.5-13.1 µm (10.5-13.5 sec. van Brummelen, *l.c.*). [sect. ***Sphaeridiobolus*** (Boud.) Brumm.] (**25**) ***Ascobolus brassicae***
28a) Ascomata usually larger. Spores ellipsoidal or fusiform, exceptionally round (but in such a case striate and ***taxa*** never reported in Italian Flora), rarely warted or dotted, usually with longitudinal striae, which can anastomose and build up a more or less complete reticulum. (sez. ***Ascobolus)*** ***29***

29) Ascomata whitish, quite small (0.35-0.04 mm high, 0.25-0.35 mm wide), obconical in each stage, smooth, with a not differentiated margin. Spores 20.5-21.5 x 9.5-10.5 µm (20-36 x 11-14 *sec.* van Brummelen*, l.c*.), ornamented with longitudinal, sometimes anastomosed striae. (26) ***Ascobolus albidus***
29a) Ascomata differently coloured, cup-shaped or almost discoidal when ripe, often furfuraceous. Margin differentiated**.** ***30***

30) Ascomata 0.50-0.75 mm diam., violet, with an even or hardly crenulate margin. Spores 13.6-15.2 x 6.8-7.8 µm, with a dotted (or even split into coarse clusters) episporic pigment. (**27**) ***Ascobolus*** aff. ***cainii***

30a) Ascomata differently coloured. Spores ornamented with longitudinal striae, which sometimes anastomose building up an almost complete reticulum. ***31***

31) Ascomata 0.7-1 mm diam., purple-pinkish, usually with an even margin. Spores 25.2-28.3 x 12-13.5 µm (18-28 x 10-12, *sec.* Van Brummelen, *l.c.*) (**28**) ***Ascobolus roseopurpurascens***

31a) Ascomata larger, yellow to yellow-greenish up to brown, usually with a crenulate margin. ***32***

32) Ascomata up to 10 mm diam. Spores 24.3-28.8 x 11-12.5 µm (19-28 x 10-14 *sec.* van Brummelen, *l.c.*). (29) ***Ascobolus furfuraceus***

32a) Ascomata usually smaller, up to 3 mm diam. Spores smaller. ***33***

33) Ascomata yellow-greenish, sessile. Spores 12.6-16.2 x 6.8-9.0 µm (9.5-15 x 6-8 *sec.* van Brummelen, *l.c.*). (30) ***Ascobolus crenulatus***

33a) Ascomata lemon coloured, stipitate. Spore 13.1-15.2 x 6.3-7.3 µm (13-15 x 7.5-8.5 *sec.* van Brummelen, *l.c.*). (31) ***Ascobolus costantini***

34) Paraphyses containing yellowish pigments. Ascomata consequently of the same colour. Spores paired in four rows parallel to the longitudinal axis of the ascus**.** (***Saccobolus*** sect. ***Saccobolus***) ***35***

34a) Ascomata whitish or otherwise coloured but not yellow. Paraphyses uncoloured or devoid of yellowish pigments. Spores otherwise arranged. (***Saccobolus*** sect. ***Eriobolus*** Sacc.)***38***

35) Spores symmetrical and with rounded ends, 16.8-18.3 x 9.5-10.5 µm (14-17.5 x 7.5-8.5 sec. van Brummelen, *l.c.*) (**32**) ***Saccobolus*** aff. ***truncatus***

35a) Spores usually asymmetrical, with slightly pointed or truncate ends. ***36***

36) Spores 13.5-16 x 7-8 µm (11.5-13.5 x 5.5-6.5 *sec.* van Brummelen *l.c.*). (33) ***Saccobolus minimus***

36a) Spores larger. ***37***

37) Spores 19.9-22 x 8.9-9.4 µm (16-22 x 7.5-9 *sec.* van Brummelen, *l.c.*) ornamented with fine isolated warts. (**34**) ***Saccobolus citrinus***

37a) Spores 25.7-28.8 x 11.5-13.1 µm (22-29 x 8.5-14.5 *sec.* van Brummelen, *l.c.*) smooth or at most with some cracks. (35) ***Saccobolus glaber***

38) Spores inside the ascus arranged in a subglobous or ellipsoidal cluster, 12.6-13.6 x 6.3-6.8 µm (11.5-14.5 x 6.5-7.5 sec. van Brummelen, *l.c.*) (**36**) ***Saccobolus dilutellus***

38a) Spores arranged on three rows,one made up of two units, the others of three units. ***39***

39) Episporium thick, coarsely warted. ***40***

39a) Episporium thin, finely dotted or almost smooth. ***41***

40) Episporio very thick (up to 3 µm). Spores 20-21 x 8.9-10 µm (17.5-23 x 8.5-10 sec. van Brummelen, *l.c.*). (**37**) ***Saccobolus beckii***

40a) Episporium thinner. Spores 12.8-13.7 x 5.7-6.4 µm. (**38**) ***Saccobolus aff. verrucisporus***

41) Outer surface of ascomata tomentose, with hairs sometimes fasciculate and building up small triangular scales. (***39***) ***Saccobolus caesariatus***

41a) Outer surface glabrous. ***42***

42) Ascomata up to 1.5 mm diam. Spores 18.3-19 x 7.3-8.4 µm (13-21.5 x 6.5-9.5 *sec*.

van Brummelen, *l c*.). (40) ***Saccobolus versicolor***

42a) Ascomata smaller, 0.15-0.27 mm diam. Spores 12.5-15 x 6.5-7 µm (10-14.5 x 5-7.5 *sec.* van Brummelen, *l.c*.). (41) ***Saccobolus depauperatus***

43) Ascomata globous in the early stages, but soon pulvinate or discoidal, 0.5-2 mm diam., pinkish-orange, sometimes reddish or brick. Spores symmetrical,17-26.2 x 10-14.7 µm (15-20 x 7.5-10.5 *sec.* Kimbrough *et al*., 1969), finely warted or dotted, but even almost smooth or on the contrary ornamented with coarser warts. Perisporium gelatinous, thin and often invisible. Asci 8-spored. Paraphyses containing carotenoid pigments**.** (42) ***Iodophanus carneus***

43a) Ascomata turbinate, subcylindrical, truncate-conical, sometimes pulvinate or discoidal when ripe, whitish but turning brownish, 0,35-4 mm wide. Spores smooth or ornamented and/or apiculate, sometimes asymmetrical, usually larger. Perisporium gelatinous, thicker. Asci 8-32-spored. Paraphyses devoid of carotenoid pigments. (***Thecotheus*** Boud.) ***44***

44) Spores smooth and not apiculate. ***45***

44a) Spores ornamented and apiculate (but see also description and observations about *T. formosanus*). ***47***

45) Asci 32-spored. Spores 34.6-42 x 17.3-19 µm (32-40 x 15-22 *sec.* Aas, *l. c*.). (43) ***Thecotheus pelletieri***

45a) Asci 8-spored. ***46***

46) Spores asymmetrical, 20-23.6 x 10-11 µm (19-23 x 8.5-10.5 *sec.* Aas, *l.c.*). (44) ***Thecotheus crustaceus***

46a) Spores symmetrical, 33.6-36.7 x 15.8-17.8 µm (32-41 x 14-18 *sec.* Aas, *l.c.*). (45) ***Thecotheus cinereus***

47) Spores mostly ayimmetrical, 17.8-21 x 8.4-9.5 µm. (**46**) ***Thecotheus formosanus***

47a) Spores larger, prevalently or exclusively symmetrical. ***48***

48) Ascomata provided with a whitish, plentiful mycelial felt. Spores 26.2-30.4 x 12.6-14.1 µm (25-30 x 12.5-14.5 *sec.* Aas, *l.c*.), finely dotted, uniseriate. Asci cylindrical. (47) ***Thecotheus lundqvistii***

48a) Ascomata devoid of mycelial felt. Spores 28-33 x 13.5-16.5 µm (29-38 x 14-18 *sec.* Aas, *l.c*.), warted, biseriate or confusely arranged. Asci cylindrical-clavate. (48) ***Thecotheus holmskjoldii***

49) Ascomata gymnohymenial (hymenium exposed in an early stage), discoidal, lenticular, pulvinate, rarely turbinate, 0.07-1.5 (3) mm diam., glabrous or hairy but not setose, superficial or slightly, but rarely immersed in the substratum. Asci usually with a functional operculum. ***50***

49a) Ascomata cleistohymenial (hymenium exposed in a later stage), globous, turbinate, cupulate, pyriform, ovoidal, never discoidal, 0.1-1 mm diam., glabrous or setose, superficial or immersed. Asci with an irregular dehiscence (by splitting) in the poly-spored species. (***Thelebolaceae p.p.***) ***63***

50) Ascomata without an *excipulum*, made up only of a bundle of asci and paraphyses. Receptacle restricted to a very thin layer of basal hyphae ("*athecium*" sec. Weber *et al.*, 1997), 0.09-0.18 mm diam. Asci clavate-sacciform, 8-spored. Spores pigmented when ripe, ornamented with spines and ridges. (***Ascodesmis***) ***51***

50a) Ascomata with normally structured receptacles (*excipulum* present). Spores hyaline, smooth or warted. ***53***

51) Spores 9.4-10.5 x 8.6-10 µm (8.5-10 x 8.3-9.5 sec. Brummelen *l.c.*), globous or subglobous, rarely broadly ellipsoidal (Q= 1,08), ornamented with tubercola isolated or merging to build up more or less long ridges. (**49**) ***Ascodesmis nana***

51a) Spores broadly ellipsoidal (Q= 1,25-1,28). ***52***

52) Spores 10-12.5 x 8.4-9.5 µm (10.5-12 x 8.5-9.5 sec. Brummelen *l.c.*), ornamented with spines (often enlarged at their apex) and some ridges. (**50**) ***Ascodesmis nigricans***
52a) Spores 12.3-13.3 x 9.5-10.4 µm (11.5-14 x 9-12 sec. Brummelen *l.c.*), ornamented with ridges, which merge to build up an almost complete reticulum. (**51**) ***Ascodesmis microscopica***

53) Ascomata fringed as covered at the margin with numerous hyaline hairs. Asci cigar-shaped, with a thickened subapical ring, dehiscing by a longitudinal slit placed above the ring itself (***Ascozonus***), 64-spored. Spores fusiform-naviculate, often inequilateral, smooth, 12.6-14.7 x 4.7-5.7 µm. (**52**) ***Ascozonus woolhopensis***
53a) Ascomata glabrous. Asci and spores with different features. ***54***

54) Ascomata whitish, 0.075-0.1 mm diam. Asci claviform, 8-spored. Spores ellipsoidal, 14.1-17.3 x 10-12 µm, without de Bary's bubbles, ornamented with coarse roundish warts. *Excipulum* strongly cyanophile. (***Chalazion***) (53) ***Chalazion erinaceum***
54a) Ascomata whitish or yellowish, rarely with orange shades, usually less than 0.5 mm diam. Asci cylindrical-claviform or broadly clavate (exceptionally cylindrical), 8-16-spored. Spores smooth, usually ellipsoidal, each of them with a de Bary's bubble. *Excipulum* strongly cyanophile only in a few species. (***Coprotus p.p.***) ***55***

55) Ascomata yellowish or orange. Paraphyses containing granular pigments more or less of the same colour. ***56***
55a) Ascomata whitish, but somrtimes turning yellow when ripe or dried. Paraphyses usually not pigmented (but see also the observations about *C. glaucellus*). ***59***

56) Ascomata bright orange, up to 0.4 mm diam. Paraphyses slightly uncinate and strongly enlarged at the apex. Asci cylindrical or cylindrical-claviform. Spores 12-12.6 x 7.3-7.8 µm (12-14 x 6-8.5 sec. Kimbr. et al., *l.c.*). (**54**) ***Coprotus aurora***
56a) Ascomata yellowish, up to 0.8 mm diam. ***57***

57) Spores 10.5-12 x 6.5-7 µm. Asci cylindrical. Paraphyses strongly uncinate. (55) ***Coprotus*** aff. ***luteus***
57a) Spores larger. Asci and paraphyses not with such characteristics. ***58***

58) Ascomata 0.35-0.45 mm diam. Spores subcylindrical or subphaseoliform, 14.7-17.3 x 8.4-8.9 µm. Asci prevalently cylindrical-claviform but sometimes cylindrical, 84-100 µm long. Paraphyses curved but not uncinate, slightly enlarged at the apex. (**56**) ***Coprotus subcylindrosporus***
58a) Ascomata up to 0.8 mm diam. Spores ellipsoidal, 16.2-19 x 10.5-12 µm. Asci cylindrical-claviform to clavate, 100-117 µm long. Paraphyses straight or curved, slightly or strongly enlarged at the apex. (**57**) ***Coprotus*** aff. ***ochraceus***

59) Asci 16-spored. Spores 12-12.5 x 7-7.5 µm (11-16 x 8-10 sec. Kimbr. et al., *l.c.*; 12-14 x 7.5-9 sec. Aas, *l.c.*). (58) ***Coprotus sexdecimsporus***
59a) Asci 8-spored. ***60***

60) Spores 8.4-9.6 x 5.2-5.8 µm (7.5-9 x 4.5-5.5 sec. Kimbr. et al., *l.c.*). Paraphyses strongly uncinate. (**59**) ***Coprotus glaucellus***
60a) Spores more than 10 µm long. Paraphyses not- or slightly uncinate. ***61***

61) Spores 17.3-18.3 x 10.5-11.5 µm (14-18 x 7.5-11.5 sec. Kimbr. et al., *l.c.*; 13-16.5 x 7-9.5 sec. Aas, *l.c.*). Asci cylindrical-claviform. Paraphyses slightly enlarged and uncinate at the apex. (60) ***Coprotus leucopocillum***
61a) Spores smaller. ***62***

62) Spores 10.5-12 x 6-7.5 µm (9-15 x 6.5-9.5 sec. Kimbr. et al., *l.c.*; 11-14 x 6-8 sec. Aas, *l.c.*). Asci

very small, claviform or clavate-sacciform. Paraphyses strongly enlarged at the apex but not uncinate. (61) ***Coprotus granuliformis***

62a) Spores 11.5-14 x 6.3-8.5 µm (12-13.5 x 5-8 sec. Kimbr. et al., *l.c.*; 10-13 x 6.5-8.5 sec. Aas, *l.c.*). Asci cylindrical. Paraphyses slightly uncinate and enlarged at the apex.
(**62**) ***Coprotus disculus***

63) Ascomata minute (up to 0,20 mm diam.), light brown-yellowish, glabrous. Spores usually very small, devoid of de Bary's bubbles. (***Thelebolus p.p***) ***64***

63a) Ascomata slightly larger (0,3-1 mm diam.), setose. Spores often containing a de Bary's bubble. Asci cylindrical-claviform or ovoidal, sometimes cylindrical 8- poly-spored, without a subapical thickening. ***65***

64) Ascomata immersed, ovoidal or subglobous. Spores 5.2-6.3 x 3.2-3.5 µm. Asci broadly ovoidal, scarce (3-5 in each receptacle), poly-spored (usually more than 200 spores in each ascus), irregularly dehiscing. (63) ***Thelebolus polysporus***

64a) Ascomata superficial, finally discoidal or pulvinate. Spores 8-9 x 3.8-4.2 µm. Asci cylindric-claviform, numerous, 8-spored, operculate. (**64**) ***Thelebolus microsporus***

65) Ascomata pyriform or ovoidal, light yellow or dirty white in the upper third, often olive brown in the lower two thirds. Setae not bulbous at the base, septate. Only one ovoidal and poly-spored (more than 2.000 spores) ascus. Spores conglobate inside the ascus.
(***Trichobolus p.p.***) ***66***

65a) Ascomata obconical, turbinate, cupulate , rarely pulvinate when over-ripe, yellowish or reddish-orange. Setae usually with a bulbous base, not septate. Asci numerous, cylindrical or cylindrical-claviform, 8-spored. Spores uniseriate or irregularly biseriate. (***Lasiobolus p.p.***) ***67***

66) Spores broadly ellipsoidal (Q= 1,19). (65) ***Trichobolus zukalii***

66a) Spores globous or subglobous (Q= 1,07). (**66**) ***Trichobolus sphaerosporus***

67) Spores ellipsoidal (Q ≤ 2.0) with rounded ends. ***68***

67a) Spores narrowly ellipsoidal, fusiform or subcylindrical (Q ≥ 2.0), with variously shaped ends. ***70***

68) Setae with a narrow (12-24 µm) polymorphous base. Asci usually broadly clavate and consequently spores biseriate (16-22 x 10.5-12 µm; 18-24 x 12-14 sec. Bezerra & Kimbrough, *l.c.*). (67) ***Lasiobolus cuniculi***

68a) Setae with a broad (up to 44 µm) ventricose base. Asci cylindrical or cylindrical-claviform and spores uni- or biseriate. ***69***

69) Spores uniseriate, 14.7-16.2 x 8.9-9.9 µm (13-18 x 7.5-11.5 sec. Bezerra & Kimbrough, *l.c.*).
(**68**) ***Lasiobolus intermedius***

69a) Spores uni- or biseriate, 20.4-22.5 x 10-11.5 µm (19-25 x 12-14 sec. Bezerra & Kimbrough, *l.c.*). (69) ***Lasiobolus ciliatus***

70) Setae less than 500 µm long. Spores 28.3-32.5 x 12-14 µm (24-34.5 x 12-17 µm sec. Bezerra & Kimbrough, *l.c.*), narrowly ellipsoidal or subcylindrical (Q= 2.31), uni- or biseriate.
(***70***) ***Lasiobolus diversisporus***

70a) Setae even more than 500 µm long. ***71***

71) Spores 23.7-28.3 x 10.5-12 µm (22.5-30 x 9-13.5 sec. Bezerra & Kimbrough, *l.c.*), with rather pointed ends, uni- or biseriate. (71) ***Lasiobolus ruber***

71a) Spores 20.4-23.1 x 8.4-9.4 µm (17-22 x 9-12 sec. Bezerra & Kimbrough, *l.c.*), often with rounded ends, usually uniseriate. (72) ***Lasiobolus macrotrichus***

DESCRIPTION OF THE SPECIES

We'll describe in this chapter the morphological features of the species with which we have not dealt in the previous contributions on fimicolous fungi. But as regards the remaining ***taxa*** only the synonymies and data concerning the studied material will be reported. We list in succession the previously treated species with relevant bibliographic references: 1 = Cacialli *et al.*, 1997; 3, 4, 6, 7, 8, 12, 13, 20, 29, 42, 69 = Cacialli *et al.*, 1995; 21, 22, 24, 30, 31, 35, 40, 43, 44, 45, 47, 63 = Cacialli *et al.*, 1998a; 23 = Cacialli *et al.,* 1998c; 26, 48 = Cacialli *et al.*, 1997b; 33, 41 = Cacialli *et al.*, 1999; 53 = Doveri *et al.*, 1998; 55, 58, 61 = Cacialli *et al.*, 1996b; 60 = Cacialli *et al.*, 1996a; 67 = Cacialli *et al.*, 1996c + 1997c; 69 = Cacialli *et al.*, 1995 + 1997c; 71, 72 = Cacialli *et al.*, 1997c.

1)Peziza perdicina (Velen.) Svrcek, *Ceská Mykol.* 30: 139, 1976.

≡ *Plicaria perdicina* Velen., *Novit. mycol. noviss.*: 150, 1947.
= *Galactinia moravecii* Svrcek, *Ceská Mykol.* 22: 90, 1968.
= *Peziza moravecii* (Svrcek) Donadini, *Doc. Mycol.* 9: 1, 1979.

MATERIAL: **ITALY:** BRESCIA, Val Saviore, 1350 m, many crowded specimens on excrements of an unidentified herbivore, under a thick layer of moss, G. Medardi, 8.95., 058.3.-Capo di Ponte, CLSM 02296.

2) Peziza merdae Donadini, *Doc. Mycol.* 9 (36): 21, 1979. ***fig.1***

MATERIAL: **ITALY:** BRESCIA, Altopiano di Gaver, 1500 m, some very crowded, superficial specimens, on human dung, G. Medardi & C. Gallinaro, 19.9.99., 079.3-Bagolino, CLSM 02699.

Ascomata in the shape of sessile apothecia, 20-50 mm diam., irregularly dome-shaped, turning to flatten, often lobate due to the reciprocal approaching. Hymenial surface smooth, quite pale brown. Outer surface smooth or finely pruinose, more or less of the same colour. Margin very wavy. Context waxy, not leaking when cut.
Spores 17.1-18 (18.5) x (8.0) 8.5-9 (9.5) µm, obliquely to vertically uniseriate, subfusiform (Q= 1.80-2.23; Q= 1.98), slightly pointed at the ends, smooth, hyaline, devoid of guttulae, ornamented with roundish warts, which are less than 0.5 µm wide and high, denser at the polar ends, isolated or rarely merging.
Asci 210-240 x 12-15 µm, amyloid, unitunicate, operculate, narrowly cylindrical, 8-spored, flattened at the apex, short-stalked.
Paraphyses plentiful, mixed with the asci and exceeding them, usually not ramified, septate (more densely at their base), 2.5-4 µm diam., up to 8 µm at the apex, containing many yellowish, vacuolar pigmernts, straight or slightly curved.
Subhymenium of a ***textura angularis***, made up of 7-11 x 5-10 µm, polygonal cells.
Excipulum scarcely differentiated in medullary and ectal ones, of a ***textura globulosa***, especially made up of 30-125 x 30-70 µm, roundish cells, which are mixed with ellipsoidal or cylindrical (these latter 4-10 µm diam.) hyphae, perpendicular to the hymenial surface. Numerous septate, interwoven, 4-7 µm diam., thin-walled rhizoids arise from the outer surface.

Observations. ***P. merdae*** is a species which typically grows on human dung, distinguishable from ***P. perdicina***, besides the ***habitat***, by the non-stipitate apothecia and hardly larger spores.

We point out that the specimens of our collection show slightly larger spores than the ones described by Donadini in the protologue (1979).

3)Peziza fimeti (Fuckel) Seaver, *N. Amer. Cup-fungi, Operc.*: 232, 1928, ***ss.*** Donadini, Gamundi.

≡ *Humaria fimeti* Fuckel, *Symb. Myc.*, suppl. 1: 50, 1871.
= *Peziza bovina* Phillips in Stev., *Myc. Scot.*: 308, 1879.
= *Humaria bovina* (Phillips) Sacc., *Syll. Fung.* 8: 145, 1889.
≡ *Plicaria fimeti* (Fuckel) Rehm in *Rabenh. Krypt. Fl.*1 (3): 1009, 1896.
= *Plicaria fimetaria* (Schumach.) Rehm, *Ann. Myc.* 5 (1): 78, 1907.
≡ *Galactinia fimeti* (Fuckel) Svrcek, *Ceská Myk.* 15 (2): 74, 1961.

MATERIAL: **ITALY: 1)** REGGIO EMILIA, Lago di Calamone, 1400 m, ten gregarious specimens on horse (***Equus caballus***) dung, F. Doveri, 13.6.93., 217.2.-Ramiseto, CLSM 04293. **2)** LIVORNO, Marina di Donoratico, 0 m, on horse dung, F. Mauri, 6.4.96., 305.1.-S. Vincenzo Nord, CLSM 04293 bis. **3)** FERRARA, Mesola, 0 m, on deer (***Cervus elaphus***) dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 04293 ter.

4) Peziza vesiculosa Bull.: Fr., *Syst. Mycol.* 2: 52, 1823. ***Pl. 1-a***

≡ *Peziza vesiculosa* Bull., *Hist. Champ. Fr.*, t. 457, f.1, 1791.
≡ *Pustularia vesiculosa* (Bull.: Fr.) Fuckel, *Jb. Nassau. Ver. Naturk.*23-24: 329, 1870.
≡ *Aleuria vesiculosa* (Bull.: Fr.) Gillet, *Champ. Fr., Discom.*: 45, 1879.
= *Peziza spenceri* Colenso, *Trans. Proc. N. Z. Inst.* 22: 458, 1890.
= *Lachnea spenceri* (Colenso) Sacc., *Syll. Fung.* 11: 400, 1895.
≡ *Galactinia vesiculosa* (Bull.: Fr.) Le Gal, *Discom. Madag.*: 33, 1953.

MATERIAL: **ITALY: 1)** PISA, Maneggio di Calambrone, 0 m, dozens of gregarious or crowded specimens, on horse (***Equus caballus***) dung, F. Doveri, 19.9.94., 272.2.-Marina di Pisa, CLSM 07194. **2)** UDINE, Sauris di Sopra, 1400 m, on horse dung, G. Medardi, 25.6.98., 030.2.-Forni di Sopra, CLSM 07194 bis. **3)** UDINE, Sauris di Sopra, 1400 m, on horse dung, G. Medardi, 25.6.98., 030.2.-Forni di Sopra, CLSM 07194 ter.

Observations. The asci of the specimens belonging to the collection *07194 ter* appear non-amyloid. Such an occurrence, which must be considered exceptional in the genus ***Peziza***, was described before by Grélet (1932-1959) and also in that occasion ***Aleuria*** (= ***Peziza***) ***vesiculosa*** was involved.
The presence of long stipitate apothecia is another property of this collection, but such a feature, contrary to the former one, isn't rare in this genus so that the specimens which possess a stalk must be regarded as mere forms of the typical species. We point out that the stipitate apothecia curiously were placed close to sessile other ones and these latter were normally amyloid.
Before us Häffner (1993) described many stipitate forms of fimicolous ***Peziza*** [***P. bovina*** Phillips; ***P. vesiculosa*** Bull.: Fr.; ***P. perdicina*** (Velen.) Svrcek] as well as obviously the stalked species par excellence, that is to say ***P. asterigma*** Vuill.

5) Scutellinia crinita (Bull: Fr.) Lamb., *Fl. Mycol. Belge*, *suppl.* 1: 301, 1887. ***fig.2a,b***

≡ *Peziza crinita* Bull., *Herb. France*: 416 (2), 1789.
≡ *Peziza crinita* Bull.: Fr., *Syst. mycol.* 2: 86, 1822.
= *Humaria hirtella* Rehm, *Ber. Naturh. Ver. Augsburg* 26: 110, 1881.
≡ *Humaria crinita* (Bull.) Quél., *Enchir. fung.*: 285, 1886.
≡ *Phaeopezia crinita* (Bull.) Sacc., *Syll. Fung.* 8: 474, 1889.

= *Lachnea hirtella* (Rehm) Sacc., *Syll. Fung.* 8: 174, 1889.
= *Scutellinia hirtella* (Rehm) O. Kuntze, *Rev. Gen. Plant.* 2: 869, 1891.
= *Ciliaria nivalis* Boud. in Boud. & Fisch., *Bull. Soc. Bot. Fr.* 41: 239, 1894.
= *Lachnea balnei* Starb., *Bih. K. Sv. Vet.-Akad. Handl.* 21: 39, 1895.
≡ *Aleurina crinita* (Bull.) Sacc. & Sydow in Sacc., *Syll. fung.* 16: 738, 1902.
= *Ciliaria hirtella* (Rehm) Boud., *Icon. Mycol.* 2: 373, 1906.
≡ *Ciliaria crinita* (Bull.) Boud., *Hist. Class. discom. Eur.*: 62, 1907.
= *Lachnea scutellata* var. *apiopesmatis* Rehm, *Ann. Mycol.* 6: 117,1908.
≡ *Trichaleuris crinita* (Bull.) Clem., *Gen. Fung.*: 175, 1909.
= *Patella fimetaria* Seaver, *North Amer. Cup-fungi (Operc.)*: 173, 1928.
= *Lachnea cervorum* Velen., *Mon. Discom. Boh.* 1: 308, 1934.
= *Lachnea gintlii* Velen., *Mon. Discom. Boh.* 1: 304, 1934.
= *Lachnea setosa* fo. *cervorum* (Velen.) Svrcek, *Sb. Nár. Mus. Praze* IV B (6): 47, 1949.
= *Lachnea setosa* var. *gintlii* (Velen.) Svrcek, *Sb. Nár. Mus. Praze* IV B (6): 47, 1949.
= *Ciliaria nivalis* (Boud.) Le Gal, *Bull. Soc. Mycol. Fr.* 78: 212, 1962.
= *Scutellinia fimetaria* (Seaver) S. C. Teng, Chung-kuo Ti Chen-chun: 763, 1964.
= *Scutellinia scutellata* var. *cervorum* Le Gal, *Bull. Soc. Mycol. Fr.* 82: 317, 1966.
= *Scutellinia fimicola* J. Moravec, *Ceská Mykol.* 22: 39, 1968.
= *Scutellinia scutellata* var. *cervorum* fo. *balnei* Le Gal, *Bull. Soc. Mycol. Fr.* 84: 379, 1969.
= *Scutellinia cervorum* (Velen.) Svrcek, *Ceská Mykol.* 25: 83, 1971.
= *Scutellinia gintlii* (Velen.) Svrcek, *Ceská Mykol.* 25: 83, 1971.
= *Scutellinia subcervorum* Svrcek, *Ceská Mykol.* 25: 86, 1971.

MATERIAL: **ITALY:** BRESCIA, Masaga, 1000 m, about twenty gregarious specimens, some of which crowded, on excrements of an unidentified animal, G. Medardi & C. Gallinaro, 8.8.99., 100.1-Valvestino, CLSM 06592 ter.

Ascomata in the shape of sessile, 3-6 mm diam., more or less discoidal apothecia, with a well differentiated, often wavy and lobate margin, which is covered with rather dense, dark brown hairs. Hymenial surface plane or slightly concave, bright red. Outer surface hairy, slightly paler.
Spores vertically or obliquely monoseriate, 17.8-21 x 11.5-13.6 (14) µm, ellipsoidal (Q= 1.34-1.66; Q= 1.50), hyaline, containing one or two large drops and many other smaller ones, rounded at the ends, thin-walled, ornamented with cyanophile, very short (usually ≤ 0,5 µm), 0,5-1,5 µm wide warts, which are evenly arranged, isolated or merged into short ridges or rarely into few meshes.
Asci 225-250 x 14-18 µm, non-amyloid, operculate, 8-spored, cylindrical, slightly flattened at the apex, with a short lobate stalk.
Paraphyses exceeding the asci even more than 30 µm, cylindrical, usually straight and not ramified, 2.5-4.0 µm wide, septate, exceptionally anastomosed, containing many vacuolar, yellow-greenish pigments, sometimes with parietal pigments, almost always shortly diverticulate and thick-walled at the apical segment, which is enlarged up to 11 µm. A few paraphises are subject to the phenomenon so called "*fourtulism*".
Subhymenium fully developed, of a ***textura globulosa-angularis***, made up of roundish or polygonal, 5-15 µm wide, light cells.
Medullary excipulum of a ***textura intricata***, made up of cylindrical or broadly ellipsoidal, 10-37 µm wide, pale hyphae, which contain some vacuolar inclusions and run perpendicularly to the hymenium surface.
Ectal excipulum of a ***textura globulosa-angularis***, made up of subglobous or angular, 30-75 x 22-50 µm, rather thick-walled, yellowish cells, which at the margin level turn subcylindrical or claviform and are intermixed with hyphoid hairs. These latter 55-70 x 15-20 µm, 0-1- septate, dark yellow- and thick-walled, intermediate in shape between the marginal hyphae themselves and the marginal hairs.
Marginal hairs crowded, dark brown with reddish shades, 780-1450 high (most more than 1000 µm), polyseptate, sometimes containing a few de Bary's bubbles, almost always straight, usually pointed at the apex (rarely rounded), up to 5-7 (10) µm thick-walled. Their base not bulging, 35-45

µm wide, short, rooting, sometimes made up of many small roots, but usually of two or three main larger ones, from which a few secondary roots arise.
Lateral hairs differentiated from the marginal ones, 400-600 µm high, narrower, usually curved, provided with one or two roots.

Observations. It's the only fimicolous (facultative) ***Scutellinia*** (Cooke) Lambotte. Morphologically it's very close both to ***S. pilati*** (Velen.) Svrcek, which however possesses larger and more elongated spores, and ***S. scutellata*** (L.: Fr.) Lambotte, this latter a ***taxon*** with narrower and more pointed spores, which are ornamented with more prominent warts. But according to Yao & Spooner (1996b) ***S. scutellata*** and ***S. crinita*** must be considered as synonyms.

6) Cheilymenia granulata (Bull.: Fr.) J. Moravec, *Mycotaxon* 38: 474, 1990. ***Pl. 1-d***

≡ *Peziza granulata* Bull., *Herb. Fr.* 438, 1790.
≡ *Peziza granulata* Bull.: Fr., *Syst. Mycol.* 2: 67, 1822.
≡ *Ascobolus granulatus* (Bull.: Fr.) Fuckel, *Jb. nassau. Ver. Naturk.* 23-24: 288, 1870
≡ *Aleuria granulata* (Bull.: Fr.) Gill., *Champ. Fr.* 56, 1879.
≡ *Ascophanus granulatus* (Bull.: Fr.) Speg., *Michelia* 1: 235, 1879.
≡ *Humaria granulata* (Bull.: Fr.) Quél., *Enchir. Fung.* 290, 1886.
= *Humaria gollmeri* Henn., *Hedwigia* 36: 233, 1897.
= *Humaria granulata* var. *robusta* Starbäck, *Bot. Notiser* : 211, 1898.
≡ *Coprobia granulata* (Bull.: Fr.) Boud., *Hist. Class. Discom. Eur.* 69, 1907.
≡ *Humarina granulata* (Bull.: Fr.) Snyder, *Univ. Washington Publ. Biol.* 8 (1): 26, 1938.
= *Ascophanus granulatus* var. *robustus* (Starbäck) Kanouse, *Mycologia* 39: 640, 1947.

MATERIAL: **ITALY: 1)** LIVORNO, Botro delle Fontanelle, 200 m, hundreds of gregarious, superficial specimens, on cattle (***Bos taurus***) dung, F. Doveri, 26.5.93, 284.4.-Collesalvetti, CLSM 03893. **2)** TRENTO, Malga di Fondo, 1.400 m, five gregarious specimens on cattle dung, F. Doveri, 17.9.94., 026.3.-Fondo, CLSM 03893 bis. **3)** TRENTO, Rifugio Panarotta, 1800 m, on cow dung, A. De Vito, 25.9.97., 060.120.-Frassilongo, CLSM 03893 ter. **4)** TRENTO, Malga Palude (Val di Rabbi), 1600 m, on cow dung, F. Doveri e G. Medardi, 8.9.99., 0253-Rabbi, CLSM 03893 penta. **5)** TRENTO, Malga Giumella (Valle di Pejo), 1700 m, on goat (***Capra hircus ?***) dung, M. Zugna, 8.9.99., 0411-Corno dei Tre Signori, CLSM 03893 esa.

7) Cheilymenia theleboloides (Alb. & Schwein.: Fr.) Boud., *Hist. Class. Discom. Eur.*62, 1907.

≡ *Peziza theleboloides* Alb. & Schwein., *Consp. Fung. Agr. Nisk.* 321, 1805.
≡ *Peziza theleboloides* Alb. & Schwein.: Fr., *Syst. Mycol.* 2: 88, 1822.
= *Peziza (Lachnea ?) ascoboloides* Bertero in Mont., *Ann. Sci. Nat. (Bot.)* 2, 8: 363, 1837.
= *Peziza eclecta* Berk. & Cooke in Cooke, *Grevillea* 5: 60, 1876.
≡ *Lachnea theleboloides* (Alb. & Schwein.: Fr.) Gillet, Champ. Fr., Discom. 74, 1879.
≡ *Humaria theleboloides* (Alb. & Schwein.: Fr.) Quél., *Enchir. Fung.* 285, 1886.
= *Humaria ascoboloides* (Bertero) Quél., *Enchir. Fung.* 288, 1886.
≡ *Scutellinia theleboloides* (Alb.& Schwein.: Fr.) Lambotte, *Fl. Mycol. Belg.,* suppl. 1: 300, 1887.
= *Leucoloma ascoboloides* (Bertero) Lambotte, *Fl. Mycol. Belg.,* suppl. 1: 318, 1887.
= *Neottiella ascoboloides* (Bertero) Sacc., *Syll. Fung.* 8: 193, 1889.
= *Lachnea ascoboloides* (Bertero) Massee, *Brit. Fung.*, *Fl.* 4: 314, 1895.
= *Cheilymenia ascoboloides* (Bertero) Boud. in Ramsb., *Trans. Br. Mycol. Soc.* 4: 367, 1914.
≡ *Patella theleboloides* (Alb. & Schwein.: Fr.) Seaver, *N. Am. Cup-fungi (operc.)* 170, 1928.
≡ *Coprobia theleboloides* (Alb. & Schwein.: Fr.) J. Moravec, *Mycotaxon* 28: 105, 1987.

MATERIAL: **ITALY:** LIVORNO, Botro delle Fontanelle, 200 m, dozens of crowded, superficial specimens, on cattle (***Bos taurus***) dung, F. Doveri, 29.10.92., 284.4.-Collesalvetti, CLSM 09692. **2)** idem, 11.92., CLSM 09692 bis. **3)** BERGAMO, Dossena, 900 m, on cow dung, G. Medardi, 077.3.-San Pellegrino Terme, CLSM 09692 ter. **4)** GROSSETO, Principina terra, 0 m, on cow dung in culture, F. Doveri, 2.4.98., 331.3.-Albere, CLSM 09692 quater.

8) Cheilymenia stercorea (Pers.: Fr.) Boud., *Hist. classific. Discom.Europe* : 63, 1907.

≡ *Peziza stercorea* Pers., *Obs. Mycol.* 2: 89, 1799.
≡ *Peziza stercorea* Pers: Fr., *Syst. Mycol.* 2: 87, 1823.
= *Peziza ciliata* Bull., *Herb. France* tav. 438 (2), 1790.
= *Peziza fulvescens* Nyl., *Not. Sällsk. Fauna Fl. Fenn. Förh.*10: 20, 1869.
≡ *Humaria stercorea* (Pers.: Fr.) Fuckel, *Jahrb. Nass. Vereins Naturk.* 23-24: 321, 1870.
= *Humaria stercorea* var. *aurantiaco-flava* Fuckel, *Jahrb. Nass.Vereins Naturk.*27-28: 64,1873.
= *Humaria alpina* Fuckel, *Fungi Rhen. exs.*2687, 1874.
= *Peziza scubalonta* Cooke & Gerard in Cooke, *Grevillea* 4: 92, 1875.
= *Peziza alpina* (Fuckel) Cooke, *Mycographia*: 81, tav.38 (148), 1879.
? = *Humaria stercorea* var. *glacialis* Rehm, *Ascomyceten* N° 506, 1879.
≡ *Lachnea stercorea* (Pers.: Fr.) Gillet, *Champ. France, Discomyc*.: 76, 1880.
≡ *Lasiobolus stercoreus* (Pers.: Fr.) P. Karst., *Acta Soc.Fauna Fl. Fen.* 2: 122, 1885.
= *Humaria fulvescens* (Nyl.) P. Karst., *Acta Soc. Fauna Fl. Fenn.* 2: 121, 1885.
= *Humaria stercorea* var. *alpina* (Fuckel) Quél., *Enchir. Fung.* 286: 1886.
= *Lachnea scubalonta* (Cooke & Gerard) Sacc., *Syll. Fung.* 8: 179, 1889.
= *Lachnea alpina* (Fuckel) Sacc., *Syll. Fung.* 8: 180, 1889.
= *Lachnea fulvescens* (Nyl.) Sacc., *Syll. Fung.* 8: 183, 1889.
? = *Lachnea stercorea* var. *glacialis* (Rehm) Sacc., *Syll. Fung.* 8: 183, 1889.
≡ *Scutellinia stercorea* (Pers.: Fr.) Kuntze, *Rev. Gen. Pl.* 2: 869, 1891.
= *Scutellinia scubalonta* (Cooke & Gerard) Kuntze, *Revis. Gen. Pl.* 2: 869, 1891.
= *Scutellinia alpina* (Fuckel) Kuntze, *Revis. Gen. Pl.* 2: 869, 1891.
= *Scutellinia fulvescens* (Nyl.) Kuntze, *Revis. Gen. Pl.* 2: 869, 1891.
≡ *Humariella stercorea* (Pers.: Fr.) J. Schröt., *Kryptog. Fl. Schles.* 3 (2): 37, 1893.
= *Cheilymenia alpina* (Fuckel) Boud., *Hist. classific. discomyc. Europe:* 63, 1907.
= *Cheilymenia fulvescens* (Nyl.) Boud., *Hist. classific. discomyc.* Europe: 63, 1907.
= *Cheilymenia ciliata* (Bull.) Maas Geest., *Proc. Kon. Ned. d. Wetensch.* 72 (3): 313, 1969.

MATERIAL: **1) ITALY:** BOLZANO, Paludi di Trinkstein, 1650 m, about ten scattered specimens on bovine (***Bos taurus***) excrements, F. Doveri, 3.9.96., 003.3.-Valle Aurina, 03694 bis CCD-Livorno. **2) ITALY:** BOLZANO, Paludi di Trinkstein, 1650 m, dozens of gregarious specimens on bovine excrements, covered with moss, F. Doveri, 3.9.96., 03694 ter CCD-Livorno. **3) ITALY:** BOLZANO, Paludi di Trinkstein, 1650 m, about ten scattered specimens on bovine excrements, F. Doveri, 3.9.96., 03694 quater CCD-Livorno.

Observations. ***Cheilymenia stercorea*** is a rather common widespread species, easily distinguishable from the other entities of the genus to which it belongs by its elective developing on excrements, the almost smooth spores and the presence of both common, deeply-rooting, marginal hairs and superficial, stellate other ones.
We have described this ***taxon*** in a previous contribution on fimicolous fungi (Cacialli *et al*., 1995) and on that occasion we mentioned the complicate nomenclatural proplem by which it is gripped, also giving our opinion on the subject and stating the reasons why we named it ***Cheilymenia stercorea*** (Pers.: Fr.) Boud. Many other scholars (Rifai, 1968; Maas Geesteranus, 1969; Gamundi, 1975; Moravec, 1993; Yao & Spooner, 1996) dealt with this hoary problem and tried to make clearer what now has to be considered a ***nomen dubium***. It's plain that Denison (1964) followed an incorrect proceeding when he designated as ***lectotypus*** a sample of Persoon's herbarium, first of all because such a sample was sent Persoon by Mougeot and so it could represent a ***neotypus*** rather

than a ***lectotypus*** (Maas Geesteranus, *l. c.*), secondly because the subject material is in bad condition and it doesn't allow an exact specific diagnosis. According again to Maas Geesteranus ***Cheilymenia ciliata*** (Bull.) Maas Geest. is the most suitable name for replacing the ***nomen dubium C. stercorea***. In fact the ***taxon*** which was originally described by Bulliard ***s. n. Peziza ciliata*** shows morphologic characteristics exactly superimposable to the ones ascribed to ***C. stercorea*** by the tradition and common use. But Maas Geesteranus's proceeding isn't in agreement with the spirit of the International Code of Botanical Nomenclature (Tokyo Code, 1994), which is based on the principle of the ***nomina conservanda***, that is to say on the "*retention of those names which best serve stability of nomenclature...., even though initially they may have been illegitimate*". Certainly ***Cheilymenia stercorea*** is one of these names.
In accordance with this principle J. Moravec (1993) has designated an ***epitypus*** [at first (1993, *l.c.*) named "***protypus***" by that scholar, later on (1998) ***epitypus***, according to the art. 9.7., ICBN, 1994] for this ***taxon,*** after having identified in ***Peziza stercorea*** Pers. the basionym of ***C. stercorea***. Let us mention that ***epitypus*** means *"a specimen or illustration selected to serve as an interpretative type when the* ***holotypus****,* ***lectotypus****, or previously designated* ***neotypus****, or all original material associated with a validly published name, is demonstrably ambiguous and cannot be critically identified for purposes of the precise application of the name of a* ***taxon****"*
Personally we agree with Moravec while we consider questionable Yao & Spooner's (*l. c.*) choise to designate a different ***epitypus***, after having identified in ***Patella stercorea*** F. H. Wigg. the basionym of ***Cheilymenia stercorea*** (F. H. Wigg.: Fr.) Boud. and interpetred as sanctioned (= F. H. Wigg.: Fr.) a ***taxon*** which has not even mentioned in ***Systema Mycologicum*** (1823).
To conclude, we point out that the specimens of our collection *03694 bis* differ from those which we previously described (Cacialli *et al., l. c.*) in the slightly larger spores (up to 24 µm long) and more branched (4-6 on average) stellate hairs, while the specimens belonging to collection *03694 quater* are characterized by rather large (up to 2 mm wide) apothecia with few stellate hairs and short (usually < 500 µm) rooting hairs.

9) Cheilymenia coprinaria (Cooke) Boud., *Icon. Mycol.* 2: 383, 1904. ***Fig. 3a,b***

≡ *Peziza coprinaria* Cooke, *Grevillea* 4: 91, 1875.
≡ *Lachnea coprinaria* (Cooke) W. Phillips, *Man. Brit. Discomyc*: 224, 1887.
≡ *Scutellinia coprinaria* (Cooke) Kuntze, *Rev. Gen.Pl.* 2: 869, 1891.
= *Sepultaria pediseta* Clem., *Bot. Surv. Nebraska* 4: 13, 1896.
= *Lachnea pediseta* (Clem.) Sacc., *Syll. Fung.* 14: 758, 1899.
≡ *Patella coprinaria* (Cooke) Seaver, *North Am. Cup Fungi (operc.)* 171, 1928.
= *Patella michiganensis* Povah, *Mycologia* 24: 240, 1932.
= *Scutellinia michiganensis* (Povah) Povah, *Papers Mich. Acad. Sci.* 20: 130, 1935.
≡ *Humaria coprinaria* (Cooke) Kanouse, *Mycologia* 39: 655, 1947.

MATERIAL: **ITALY: 1)** BERGAMO, Schilpario, 1250 m, some gregarious, superficial specimens, on bovine (***Bos taurus***) excrements, G. Medardi, 10.89., 057.3.-Schilpario, MCVE 575. **2)** LIVORNO, Botro delle Fontanelle, 200 m, some specimens on bovine excrements, F. Doveri, 18.5.96., 284.4-Collesalvetti, CLSM 02696 bis. **3)** UDINE, Sauris di Sopra, 1400 m, on horse (***Equus caballus***) dung, G. Medardi, 25.6.98., 030.2.-Forni di Sopra, CLSM 02696 ter.

Apothecia sessile, 2-5 mm wide, more or less discoidal. Hymenial surface slightly concave, smooth, bright orange. Margin marked, uninterrupted, wholly covered with dark yellowish, quite sparse hairs, also observable to the naked eye. Outer surface smooth, hardly lighter.
Spores 16.8-18.3 x 9.4-10.5 (11) µm (Q= 1.60-2.00; Q= 1.78), uniseriate, ellipsoidal or subcylindrical, thin-walled, rounded at the ends, smooth, hyaline, devoid of oil drops, including a granulous yellowish material, which can be seen by cotton blue.

Asci 191-236 x 13-16 µm, 8-spored, non-amyloid, operculate, narrowly cylindrical, quite thick-walled, rounded or slightly flattened at the apex, with a short stalk.
Paraphyses 2-5 mm wide, scarcely pigmented, usually unbranched, septate, straight, hardly exceeding the asci, usually clavate or capitate (up to 11 µm wide at the apex).
Subhymenium of a ***textura angularis***, made up of polygonal, 5-10 µm wide hyphae.
Medullary excipulum of a ***textura intricata***, made up of broad (10-22 µm) cylindrical or ellipsoidal hyphae, septate, thick-walled, perpendicular to the hymenium.
Ectal excipulum of a ***textura globulosa***, with roundish, 33-160 x 27-125 µm hyphae, turning cylindrical towards the margin and producing at the base a palisade of very broad (10-30 µm), thick-walled, septate, sometimes ramified rhizoids.
Marginal hairs deeply rooting, yellowish-brown, 170-735 x 22-42 µm, thick-walled (4-6 µm), pointed or sometimes rounded at the apex, 0-5-septate, straight (unusually sinuous), with two or even more, occasionally septate, long roots.
Lateral hairs 157-260 x 18-22 µm, sinuous, not rooting.

Observations. ***Cheilymenia fimicola*** (De Not. & Bagl.) Dennis is very close to ***C. coprinaria*** even if it differs in the larger spores and shorter hairs (Moravec, 1990) as well as, according to Yao & Spooner (1996), in the broader asci and smaller apothecia. Also ***Cheilymenia megaspora*** (Gamundi) Moravec is quite close to ***C. coprinaria***, but it's distinguishable by the larger (25-29.5 x 12-13.5 µm), warty and ridged spores.

10) Cheilymenia fraudans (P. Karst.) Boud., *Hist. Class. Discomyc. Eur*. : 63, 1907. ***Fig. 4***

≡ *Peziza subhirsuta *fraudans* P. Karst., *Not. Sällsk. Fauna Fl.Fenn.*11: 229, 1870.
≡ *Peziza fraudans* (P. Karst.) P. Karst., *Mycol. Fenn.*: 65, 1871.
≡ *Neottiella fraudans* (P. Karst.) Sacc., *Syll. Fung.* 8: 191, 1889.

MATERIAL: **ITALY:** TRENTO, Andalo, 1000 m, dozens of gregarious specimens on cow (***Bos taurus***) dung, G. Medardi, 25.9.97., 060.4.-Lavis, CLSM 04297.

Apothecia 2-4 mm wide, sessile, at first cup-shaped but turning discoidal. Outer surface reddish, glabrous to the naked eye. Hymenial surface more or less of the same colour, smooth, flat or slightly concave. Margin darker, well differentiated, hardly crenulate **(*fide*** Medardi).
Spores (13.6) 14-16.8 (17.3) x 11.5-13.6 µm, subglobous or broadly ellipsoidal (Q= 1.13-1.36; Q= 1.22), uniseriate, hyaline, cyanophile, seemingly smooth, devoid of oily drops, in the early stages very granulous.
Asci 212-250 x 13-17 µm, non-amyloid, operculate, 8-spored, rather thick-walled, rounded at the apex, with a pleurorynchous stalk.
Paraphyses 3-4 µm wide, cylindrical, septate, usually ramified at the base, containing many yellow-greenish pigments, exceeding the asci even more than 20 µm, straight or slightly curved at the apex, which is enlarged up to 10-12 µm.
Subhymenium of a ***textura angularis***, made up of polygonal, 3-5 µm wide hyphae.
Medullary excipulum of a ***textura intricata***, made up of cylindrical or pyriform hyphae, up to 20 µm wide, narrowing at the septa, thick-walled, with the longitudinal axis perpendicular to the hymenial surface.
Ectal excipulum of a ***textura globularis***, made up of roundish, thick-walled hyphae, 20-100 µm wide, turning to lengthen near the margin.
Hairs in the shape of setulae at the margin, 50-200 x 15-19 µm, light yellowish-brown, not septate (sometimes with one septum), with 1-2 µm thick walls, pointed or rarely rounded at the apex,

slightly curved or wavy, usually with a simple, flattened or slightly pointed base (sometimes with two roots). A few hairs, intermediate between the setulae and marginal lengthened hyphae, are also observable.

Observations. As regards the differential diagnosis from ***C. rubra*** we refer to the observations about this latter ***taxon***.
Moravec (1988) revised the type material of ***C. fraudans*** and from his description we can deduce that our collection differs in a few details: the spores are slightly smaller and seemingly smooth even in cotton blue, while the hairs are scarcely septate.
Moravec (*l.c.*) states too that the species described by Gamundí (1960) ***sub nomine Cheilymenia fraudans*** doesn't correspond at all with Karsten's original one. In fact the illustrations which are enclosed to the work of the South American scholar allow to guess it's a ***taxon*** related to ***C. theleboloides***.

11) Cheilymenia rubra (Cooke) Boud., *Hist. Class. Discomyc. Eur.*: 63, 1907. ***Fig. 5a,b; Pl. 2-c***

≡ *Peziza theleboloides* var. *rubra* Cooke, *Fung. Brit. Exs.* ser. I, n° 572, 1872 (*nom. inval.*).
≡ *Peziza rubra* Cooke, *Grevillea* 3: 74, 1874.
≡ *Lachnea rubra* (Cooke) Phillips, *Man. Brit. Discomyc.*: 225, 1887.
≡ *Scutellinia rubra* (Cooke) Kuntze, *Rev. Gen. Plant.*2: 869, 1891.

MATERIAL: **ITALY: 1)** TRENTO, V. Brenta, 1000 m, hundreds of gregarious, usually very crowded, superficial specimens on cow (***Bos taurus***) dung and surrounding, very rich soil, G. Medardi, 17.5.98., 081.1-Caldonazzo, CLSM 05098. **2)** RAVENNA, Lugo, on mud of water softening, M. Rava, 13.4.99., 222.2.-Lugo, CLSM 05098 bis.

Apothecia sessile, urceolate to cupulate, later on discoidal, up to 5 mm wide, membraneous. Hymenial surface smooth, slightly concave, reddish. Margin even, densely covered with stiff, quite dark brown hairs. Outer surface more or less of the same colour, with shorter ans sparcer hairs.
Spores vertically or obliquely uniseriate, 16.2-17.8 (18.9) x 9.4-11 µm, ellipsoidal (Q= 1.52-1.88; Q= 1.72), rounded at the ends, in the early stages thick-walled and containing yellowish granulations, hyaline (yellowish in cotton blue), almost smooth to thinly and unevenly dotted, devoid of both oil drops and gaseous de Bary's bubbles.
Asci 190-220 x 12-14 µm, 8-spored, unitunicate, non-amyloid, rather thin-walled, rounded at the apex, with a long and lobate stalk.
Paraphyses cylindrical, 3-4 µm wide, simple or more often ramified at the base, sometimes anastomosed, septate, containing many yellow-greenish pigments, exceeding the asci, straight, enlarged up to 9 µm at the apex.
Subhymenium well differentiated, of a ***textura angularis***, made up of light, 7-17 x 5-12 µm, polygonal hyphae.
Medullary excipulum of a ***textura intricata***, made up of light, cylindrical or broadly ellipsoidal, 7-27 µm wide hyphae, predominantly perpendicular to the hymenial surface, septate, sometimes ramified, containing many vacuoles.
Ectal excipulum of a ***textura globulosa*** (at the base) or ***globulosa-angularis*** (at the margin), made up of roundish or polygonal hyphae, turning claviform near the margin, 25-50 x 20-40 µm, with thick and pigmented walls.
Hairs 120-450 x 18-27 µm, sometimes slightly ventricose, usually wavy, pointed or sometimes slightly rounded at the apex, often incrusted, septate (1-5 septa), thick-walled (2-4 µm), with a simple or bifurcate, rooting, truncate or more often attenuated base. At the margin also a few non-

septate hairs are observable, showing intermediate features between the claviform hyphae and the typical hairs. From the base numerous septate rhizoids arise, 8-12 µm wide, rounded at the apex.

Observations. Macroscopically ***C. rubra*** resembles a ***Scutellinia*** (Cooke) Lambotte. Also the microscopical features (especially the ***excipulum*** differentiated in a medullary part of a ***textura intricata*** and in an ectal part of a ***textura globulosa-angularis***) are very close to the ones which normally may be found in that genus, so that recently the ***taxon*** in subject was placed into the section ***Pseudoscutelliniae*** J. Moravec (1990). But obviously it belongs to the genus ***Cheilymenia*** as proved, besides by the ***habitat***, also by the morphological characteristics of the spores, devoid of guttulae, yellowish in cotton blue, provided with loosening walls when treated by such a stain.
The section ***Pseudoscutelliniae*** has been subdivided in two series: 1) ser. ***Coprinariae*** J. Moravec, characterized by large (up to 1200 x 55 µm) hairs and orange or yellowish-orange apothecia. The above described ***C. coprinaria*** belongs to this group and on the basis of such features is easily separable from the other ***Pseudoscutelliniae*** proposed in this work; 2) ser. ***Pseudoscutelliniae*** J. Moravec, stood out for red or reddish-orange (very rarely bright orange) apothecia as well as for less than 600 µm long hairs. As representatives of the latter series we mention, obviously besides ***C. rubra***, also ***C. fraudans*** (P. Karst.) Boud., ***C. humarioides*** (Rehm) Gamundí, ***C. pseudohumarioides*** Dissing, J. Moravec & Sivertsen, ***C. liskae*** J. Moravec, Fellner & Landa. The last three ***taxa*** of this list differs collectively from ***C. rubra*** in the wider spores and not fully pigmented hairs, which on the contrary are hyaline in their third upper part (Moravec, 1989). Individually ***C. humarioides*** differs from ***C. rubra*** also in the smaller apothecia, not so densely hairy at the margin, as well as in the spores provided with three-layered walls and ornamented with coarser warts. In turn ***C. pseudohumarioides*** is distinguishable, as well as by the smaller apothecia and sparcer marginal hairs, also by the broadly ellipsoidal spores. Finally ***C. liskae*** possesses coarser spore ornamentations and often hairs with a multifurcate base. But in this species the size of apothecia and the density of hairs more or less are superimposable to ***C. rubra***.
C. fraudans deserves a special mention, as it noticeably differs from all the other entities belonging to this series, and particularly from ***C. rubra***, in the smaller and broadly ellipsoidal, even subglobous spores, often ornamented with an incomplete reticulum (Moravec, 1989).
C. rubra isn't an exclusively fimicolous species, on the contrary it's often observable on vegetables debris, straw, rich soils (Moravec, 1989, *l.c.*).

12) Cheilymenia pulcherrima (Crouan & Crouan) Boud., *Hist. Class. Discomyc. Europe* 63, 1907.

≡ *Ascobolus pulcherrimus* Crouan & Crouan, *Ann. Sci. Nat. Bot.* sér. 4, 10: 196, 1858.
≡ *Peziza pulcherrima* (Crouan & Crouan) Cooke, *Mycogr.* 84, 1876.
≡ *Humaria pulcherrima* (Crouan & Crouan) Speg., *Michelia* 1: 37, 1878.
≡ *Lachnea pulcherrima* (Crouan & Crouan) Gill., *Champ. Fr.* 76, 1880.
≡ *Scutellinia pulcherrima* (Crouan & Crouan) Kuntze, *Rev. Gen. Plant.* 2: 869, 1891.
≡ *Lasiobolus pulcherrimus* (Crouan & Crouan) J. Schröt., *Krypt.-Fl. Schles.* 3 (2): 54, 1893.
≡ *Patella pulcherrima* (Crouan & Crouan) Seaver, *N. Am. cup-fungi (operc.)* 172, 1928.

MATERIAL: **ITALY: 1)** LIVORNO, Botro delle Fontanelle, 200 m, thousands of gregarious, superficial specimens, on cattle (***Bos taurus***) dung, F. Doveri, 29.10.92., 284.4.-Collesalvetti, CLSM 09792. **2)** REGGIO CALABRIA, Ferdinandea (Stilo), 1.100 m, hundreds of gregarious, most crowded, specimens on cattle dung, F. Doveri, 30.10.95., 584.4.-Ferdinandea, AMB 3694.

13) Cheilymenia aurantiacorubra K. S. Thind & S. C. Kaushal, *Indian Phythopath.* 33 (3): 428, 1980.

MATERIAL: **1) ITALY:** LIVORNO, Botro delle Fontanelle, 200 m, hundreds of gregarious, superficial specimens, on cattle (***Bos taurus***) dung, F. Doveri, 29.10.92, 284.4.-Collesalvetti, CLSM 15392. **2)** TRENTO, Malga Montagna Grande, 1700 m, on cow dung, F. Doveri e G. Medardi, 26.9.97., 060.120.-Frassilongo, CLSM 15392 quater. **3)** ROVIGO, Rosolina mare, 0 m, on dung of an unidentified herbivore, L. Villa, 16.4.99., 169.2.-Contarina, 15392 penta.

14) Trichophaea gregaria (Rehm) Boud., Hist. Class. Discom. Eur.: 60, 1907. ***Fig. 6a,b***

≡ *Humaria gregaria* Rehm, *Ascom. exs.*n° 6, 1869.
= *Peziza hemisphaerica* var. *minor* Nyl., *Pez. Fenn.*: 21, 1869.
= *Peziza hemisphaerica* var.β *proximella* P. Karst., *Mon. Pez*.: 125, 1869.
= *Peziza brunnea* Cooke, Grevillea 3: tab. 44, fig. 98, 1874.
≡ *Sarcoscypha gregaria* (Rehm) Cooke, *Mycogr.*: 69, 1879.
≡ *Sepultaria gregaria* (Rehm) P. Karst., *Fung. Sib. Rar.* 2: 145, 1884.
≡ *Lachnea gregaria* (Rehm) Phillips, *Brit. Disc.*214, 1887.
≡ *Scutellinia gregaria* Kuntze,*Rev. Gen. Plant.,* pl. 2: 869, 1891.
≡ *Patella gregaria* (Rehm) Seaver, *North Amer. Cup-Fungi*: 176, 1928.
= *Lachnea caespitosa* Velen., *Mon. Disc. Boh.*: 311, 1934.
= *Lachnea longesetosa* Velen., *Novit. Mycol. Noviss.*: 144, 1947.

MATERIAL: **ITALY:** TRENTO, Pergine Valsugana, 480 m, about ten gregarious, superficial specimens on excrements of unidentified herbivore, rich in plant debris, F. Bersan, 9.97., 060.2.-Pergine Valsugana, CLSM 04997.

Apothecia up to 3.5 mm wide, sessile, shallow cup-shaped. Outer surface hairy, greyish-brown. Margin involute, clothed with dark brown, short, thick hairs, which seemingly are not differentiated from the lateral ones. Hymenial surface smooth, slightly concave, light greyish, turning dark brown when dried.
Spores obliquely uniseriate, 20-24.5 (28.3) x (10.5) 11-12 (13.5) µm, narrowly ellipsoidal to fusiform (Q= 1.81-2.36; Q= 2.02), rounded or slightly pointed at the ends, thick-walled, hyaline, smooth but when ripe ornamented with small (length and width< 0,5 µm), roundish, quite thick warts, containing one or two large oil drops.
Asci 212-225 x 12.5-15 µm, non-amyloid, operculate, cylindrical, 8-spored, easily collapsing and therefore hardly observable.
Paraphyses 2.5-3.5 µm wide, cylindrical, septate, only few µm exceeding the asci, not- or ramified at the base, containing few not pigmented vacuoles, slightly clavate (up to 5 µm wide) at the apex.
Medullary excipulum of a ***textura intricata*.**
Ectal excipulum of a ***textura angularis***, towards the outside of a ***textura globulosa-angularis***, made up of subglobous or polygonal, dark brown, thick-walled hyphae, 17-38 µm wide, turning cylindrical or claviform near the margin.
Marginal hairs 190-388 x 12-17.5 µm, often fasciculate, dark brown, scarcely septate, pointed, some ones ventricose, almost always straight, thick-walled (2-3 µm), sometimes with a truncate base but usually with one root.
Lateral hairs differentiated from the marginal ones, as slightly smaller and sometimes two- or three-forked at the base.
Hyphoid hairs numerous, present at the base.

Observations. In literature the mentions of species belonging to the genera ***Trichophaea*** Boud. and ***Trichophaeopsis*** Korf & Erb and behaving as occasionally fimicolous are quite few.

We report for example ***Trichophaea abundans*** (P. Karsten) Boud., which was found on goat dung (Valldosera & Guarro, 1990) and ***Trichophaeopsis tetraspora*** Dissing & Paulsen on cow (Dissing & Paulsen, 1976) and donkey (Donadini, 1985) excrements.
T. gregaria is a common species, which preferably grows on "decayed wood or plant debris" (Schumacher, 1979). But the specimens of our collection were found on dung of herbivore, which however contained indigestible vegetables in large quantities.
From the beginning up to the present time ***T. gregaria*** has been subjected to continual nomenclatural "updates", which probably arose from the conciseness of the original diagnosis. So that we could witness the birth of the varieties ***lignicola*** Rhem (a mere ecological form), ***intermedia*** Le Gal (1937) and forms ***ferruginea*** Svrcek, 1948 ("*.. pilis..ferrugineo-fuscis*"), ***nigrella*** Svrcek, *l.c.* ("*pilis..nigrofuscis usque subnigris*), ***obtusipilosa*** Svrcek, *l.c.* ("*pilis maxima ex parte apice obtusis"*), ***laevigata*** Korf & Graff (smooth spores).
In Rehm's original diagnosis as well as in Cooke's (1879), Phillips's (1887) and Seaver's (1928) subsequent ones the spores of this entity are judged as smooth, but sometimes rough when ripe. But other scholars (Massee, 1895; Grelet, 1932; Dennis, 1981) regard the spores as quite smooth and justify the establishment of Le Gal's var. ***intermedia*** ("*spores..ornées de fines verrues*"), which according to the french mycologist doesn't possess smooth spores nor coarsely warted ones as in ***Trichophaea pseudogregaria*** (Rick) Boud.
After Kanouse (1958), which could study the original material, we judge unnecessary this variety, as thin spore warts are present also in the ***typus***. On this subject we also think unnecessary the establishment at species rank of a ***taxon*** named ***Trichophaea variornata*** Korf & Zhuang (1991), which "*ab T. gregaria f. gregaria verruculis ascosporarum grandioribus, ab T. pseudogregaria verruculis ascosporarum minoribus differens*".

15) Trichophaea subalpina Jamoni, *Funghi e Ambiente* 77: 15, 1998.

MATERIAL: **ITALY:** VERCELLI, Val d'Otro, 1600 m, some gregarious or crowded specimens on cow (***Bos taurus***) dung, D. Garofoli e G. Baiano, 13.6.93., 071.2., GMFN 2661.

16) Pseudombrophila minuta Brumm., *Libri Bot.* 14: 50, 1995. ***Fig. 7***

MATERIAL: **ITALIA:** GROSSETO, Principina Terra, 0 m, three gregarious specimens on horse (***Equus caballus***) dung in culture, F. Doveri, 2.4.98., 331.3.-Alberese, CLSM 02898.

Apothecia 0.5-0.8 mm high, up to 0.8 mm wide, sessile, turbinate, later on cup-shaped. Outer surface whitish with some violet spots. Margin well differentiated, slightly raised and hardly crenulate, violet. Hymenium flat or slightly concave, dirty white.
Spores 15.7-16.8 x (9) 9.4 (10) µm, ellipsoidal (Q= 1.66-1.88; Q= 1.75), uniseriate, equilateral, hyaline, but containing a yellowish material when ripe, smooth, rounded at the ends, thick-walled.
Asci 165-180 x 12-14 µm, 8-spored, non-amyloid, operculate, slightly flattened at the apex, rather long-stalked.
Paraphyses 1.5-2 µm wide, cylindrical-filiform, not- or on the contrary often ramified at the base, septate, containing many hyaline vacuoles, enlarged at the apex up to 3 µm, exceeding the asci, devoid of intercellular pigments.
Subhymenium not differentiated from the medullary ***excipulum***.

Medullary excipulum of a ***textura intricata***, made up of light cylindrical hyphae, sometimes slightly encrusted, 2-5 µm wide, mixed with a few roundish ones.
Ectal excipulum of a ***textura globulosa-angularis***, yellowish-brown, made up of roundish or polygonal pigmented hyphae, 11-35 x 10-27 µm. The whole surface is clothed with only one type of pigmented hyphoid hairs, at intervals numerous, isolated or sometimes fasciculate, septate, ramified, 2-4 µm wide, thick-walled, rounded at the apex.

Observations. The recent (1995) van Brummelen's worldwide monograph fulfils the mycologists who, in agreement with Korf (1972), wished a careful revision of the genera ***Pseudombrophila*** Boud. (1885) and ***Fimaria*** Velen. (1934). With reference to previous studies on the dehiscence of the ascus and frame of the spore wall (van Brummelen, 1986; Dissing & Schumacher, 1994), the Dutch scholar, judges unwarranted to keep independent two genera which often have been distinguished from each other only on account of the different frame of the ***excipulum***'s hairs. So that he synonymizes ***Fimaria*** with ***Pseudombrophila***.
Up to now ***P. minuta*** must be considered very rare because only two official findings are known: our own and the one reported in the ***typus***, both from horse dung.
This ***taxon*** has to be placed into the group of species belonging to the Section ***Pseudombrophila*** sec. Brumm. (apothecia opening during a rather late ripening stage; marginal hairs usually not differentiated from the lateral ones; perisporium not reticulate), characterized by a white or hyaline hymenium. The entity in subject differs from ***Pseudombrophila virginea*** (Svercek & Moravec) Brumm. and ***Pseudombrophila theioleuca*** Rolland (the other two species of this group) in the very small apothecia. In comparison with the former shows also quite larger spores, with the latter wider spores and consequently a smaller lenght/width ratio (van Brummelen, 1995).
The specimens of our collection are lighter and slightly larger than ***typus*** and possess asci with a longer stalk. The other features are fully superimposable.

17) Pseudombrophila merdaria (Fr.) Brumm., *Libri Bot.* 14: 45, 1995. ***Fig. 8; Pl. 2-a***

≡ *Peziza merdaria* Fr., *Elench. fung.* 2: 11, 1828.
= *Peziza canina* P. Karsten, *Syn. Pez. Ascob. Fenn.* 9, 1861.
= *Peziza nobilis* P. Karsten, *Fung.fenn.* n° 635, 1867.
= *Peziza luteopallens* Nyl., *Not. Sällsk. F. Fl. fenn. Förh.* 10:18, 1868.
= *Peziza canina* var. *nobilis* (P. Karsten) P. Karsten, *Not. Sällsk. F. Fl. fenn. Förh.* 10: 118, 1869.
= *Peziza subfurfuracea* Nyl., *Not. Sällsk. F. Fl. fenn. Förh.* 10: 51, 1869.
= *Peziza deerrata* P. Karsten, *Not. Sällsk. F. Fl. fenn. Förh.* 10: 119, 1869.
= *Peziza cucurbitae* Gerard, *Bull. Torrey Bot. Cl.* 5: 26, 1874.
= *Peziza brassicaecola* Berk., *Grevillea* 3: 157, 1875.
= *Peziza rufescens* J. Schröt., in Rabenh., *Fungi Eur. exs.* cent. 24, n° 2311, 1876.
= *Peziza schroeteri* Cooke, *Grevillea* 6: 110, 1878.
= *Peziza chartarum* Quél. ex Cooke, *Mycogr.* 234, f. 394, 1879.
= *Humaria chartarum* (Quél. ex Cooke) Quél., *Bull. Soc. Bot. Fr.* 25:291, 1879.
≡ *Aleuria merdaria* (Fr.) Gill., *Champ. Fr., Discom.*, 2:53, 1880.
≡ *Humaria merdaria* (Fr.) Quél., *C. r. Ass. Fr. Avanç. Sci.* 9: 672, 1881.
= *Helotium pedrottii* Bres., *Fungi Trident.* 1: 14, 1881.
= *Pyronema luteopallens* (Nyl.) Rehm, *Ascom. Lojkani* n° 5, 1882.
= *Dermatea sydowii* Rehm in Sydow, *Mycoth. march.*n° 379, 1882
= *Humaria glacialis* Rehm, *Hedwigia* 21: 97, 1882.
= *Humaria pedrottii* (Bres.) Rehm, *Ascom.* n° 754, 1884.
= *Geoscypha schroeteri* (Cooke) Rehm, *Ascom.* n° 901, 1888.
= *Humaria canina* (P. Karsten) Sacc., *Syll. Fung.* 8: 137, 1889.

= *Humaria canina* subsp. *nobilis* (P. Karst.) Sacc., *Syll. Fung.* 8: 138, 1889.
= *Neottiella luteopallens* (Nyl.) Sacc., *Syll. fung.* 8: 191, 1889.
= *Humaria deerrata* (P. Karsten) Sacc., *Syll. fung.* 8: 140, 1889.
= *Pezizella cucurbitae* (Gerard) Sacc., *Syll. fung.* 8: 285, 1889.
= *Pezizella brassicaecola* (Berk.) Sacc., *Syll. fung.* 8: 283, 1889.
= *Humaria schroeteri* (Cooke) Sacc., *Syll. fung.* 8: 141, 1889.
= *Pyronema chartarum* (Quél. ex Cooke) Sacc., *Syll. fung.* 8: 109, 1889.
= *Humaria pictilis* Quél., *C. r. Ass. Fr. Avanç. Sci.* 20 (2): 464, 1892.
= *Pseudombrophila pedrottii* (Bres.) Boud., *Ic. Mycol., Livr.* 2: (3), 1904.
≡ *Ascophanus merdarius* (Fr.) Boud., *Hist. Class. Discom. Eur.* 76, 1907.
= *Ascophanus caninus* var. *nobilis* (P. Karsten) Boud., *Hist. Class. Discom. Eur.* 76, 1907.
= *Cheilymenia luteopallens* (Nyl.) Boud., *Hist. Class. Discom. Eur.* 63, 1907.
= *Ascophanus derratus* (P. Karsten) Boud., *Hist. Class. Discom. Eur.* 76, 1907.
= *Pseudombrophila chartarum* (Quél. ex Cooke) Boud., *Hist. Class. Discom. Eur.* 65, 1907.
= *Ascophanus pictilis* (Quél.) Boud., *Hist. Class. Discom. Eur.* 76, 1907.
= *Peziza pedrottii* (Bres.) Mig., *Kryptog.-Fl. Deutsch.* 13 (3), 2: 1015, 1913.
= *Pseudombrophila derrata* (P. Karsten) Seaver, *N. Am. Cup-fungi (operc.)* 141, 1928.
= *Pyronema canina* Dearn. & Bisby in Bisby *et al.*, *Fungi of Manitoba* 60, 1929.
= *Infundibulum tiliaceum* Velen., *Monogr. Discom. Boh.* 1: 351, 1934.
= *Humaria ustulata* Velen., *Novit. mycol.* 199, 1939.
= *Lachnea humana* Velen., *Novit. Mycol.,* 208, 1940.
= *Humaria nivea* Velen., *Op. bot. czech.* 4: 148, 1947.
= *Pseudombrophila luteopallens* (Nyl.) T. Schumach., *Mycotaxon* 33: 172, 1988.

MATERIAL: **ITALY: 1)** VENEZIA, Caroman, 0 m, about ten gregarious specimens on wild rabbit (***Oryctolagus cuniculus***) dung in culture, F. Doveri, 5.97., 148.2.-Chioggia, MCVE 586. **2)** UDINE, Monte Crostis, 2000 m, on cow (***Bos taurus***) dung, F. Bersan, 26.6.98., 031.1.-Fontana Panzit, CLSM 02097 bis. **3)** RAVENNA, Lugo, on excrements of an unidentified animal, M. Rava, 25.4.99, 222.2.-Lugo, CLSM 02097 ter.

Apothecia up to 1,5 mm wide, at first subglobous, later on subconical, ripening discoidal or pulvinate, shortly stipitate. Hymenial surface flattened or convex, smooth, very light pink or whitish. Outer surface tomentous, light brown. Margin brownish, crenulate. Mycelium scanty. Sclerotium absent.
Spores 12.6-14.1 x 7.3-8.4 µm, ellipsoidal (Q= 1.52-1.84; Q= 1.67), hardly pointed at the ends, uniseriate, hyaline, smooth (imperceptibly dotted when ripe), often containing a gaseous de Bary's bubble, rather thick-walled, sometimes with a thickening at one end which resembles an apiculum.
Asci 110-130 (150) x 8-11 µm, 8-spored, operculate, non-amyloid, cylindrical, long-stalked and rounded at the apex.
Paraphyses 1,5-2,0 µm wide, cylindrical-filiform, containing a few very light yellowish vacuoles, septate, ramified at any level but particularly at the apex, where they enlarge up to 4-5 µm, sometimes anastomosed, exceeding the asci, purple brown-walled.
Subhymenium made up of small, hyaline, polygonal or cylindrical hyphae.
Medullary excipulum of a ***textura intricata***, made up of elongate-cylindrical, 3-8 µm wide, septate, hyaline, thin-walled hyphae.
Ectal excipulum of a ***textura angularis***, made up of polygonal, 7-20 x 5-12 µm, brown- and thick-walled hyphae. An intercellular, mottled pigment of the same colour is also observable. From the outer hyphae numerous, septate, ramified, 2-5 µm wide, brown-walled, hyphoid hairs arise, scanty at the base, thicker towards the apex, even fasciculate at the margin. On the edge also hyaline, moniliform, polysegmented hairs are present.

Observations. Unlike the usual features of ***P. merdaria***, which shows a reddish brown hymenium, the hymenial surface of the specimens belonging to the former collection which we have studied

appeared very light, so that at first sight we judged to be placed in front of ***Pseudombrophila theioleuca*** Rolland, a rather common species on deer dung, which is easily distinguishable also by the narrowly ellipsoidal spores (Q= 1.9-2.0). We think that the defective pigmentation must be ascribed to the inadequate insolation of the culture. However also Calonge & Rodríguez (1985) described a collection of ***P. merdaria*** [***sub nomine Psedombrophila deerrata*** (P. Karsten) Seaver] provided with a very light hymenium.
P. merdaria is close both to ***Pseudombrophila coprina*** (Eckbl.) Brumm. and ***Pseudombrophila porcina*** (Svrcek & Kubicka) Brumm., but the former differs in the smaller spores (Eckblad, 1968) and almost smooth apothecia, the latter in the larger asci and spore Q, as well as in the paraphyses not enlarged at the apex (Svrcek & Kubicka, 1965).
The latter collection which we have observed showed in comparison with the former typically coloured (reddish-brown) and larger apothecia (5-7 mm wide) as well as slightly larger spores (15.2-16.8 x 9.5-10 µm), provided with more rounded ends (see van Brummelen, 1995, fig. 16), even if they maintain a more or less superimposable length/width ratio (Q= 1.60). It's well known that this species is very changeable in the ***habitat*** and macroscopical features.

18) Pseudombrophila cervaria (Phill. in J. Stevenson) Brumm., *Libri Bot.* 14: 27, 1995. ***Fig. 9***

≡ *Peziza cervaria* Phill., *Mycol. Scot.* 308, 1879.
= *Mollisia coprophila* Speg., *Bol. Acad. nac. Cienc. Córdoba* 11: 267, 1888.
≡ *Humaria cervaria* (Phill.) Sacc., *Syll. Fung.* 8: 143, 1889.
= *Humaria guanaci* Rehm, *Bih. K. Sv. Vet. Acad. Handl.* 25, Afd. III (6): 17, 1899.
≡ *Ascophanus cervarius* (Phill.) Boud., *Hist. Class. Discom.Eur.*: 76, 1907.
= *Ascophanus ruber* Velen., *Novit. Mycol.* 202, 1940 (1939), non *Ascophanus ruber* Quél., *Grevillea* 8: 117, 1880.
≡ *Fimaria cervaria* (Phill.) Brumm., *Persoonia* 2: 325, 1962.

MATERIAL: **1) ITALY:** TRENTO, Bersone, 850 m, about ten gregarious specimens on the surface of ovine excrements, G. Medardi, 5.89., 080.4.-Bersone, MCVE 577 **2) ITALY:** BRESCIA, Valvestino, 1000 m, on roe deer (***Capreolus capreolus***) dung, G. Medardi, 29.10.96., 100.1.-Valvestino, CLSM 02096 bis. **3)** UDINE, Passo del Pura, 1400 m, on marten (***Martes martes***) dung in culture, F. Bersan, 11.9.97., 031.3-Ampezzo, CLSM 02096 ter. **4)** TRENTO, Malga Palude (Val di Rabbi), 1600 m, on deer (***Cervus elaphus***) dung in culture, F. Doveri e G. Medardi, 8.9.99., 0253-Rabbi, CLSM 02096 quater.

Fruit-bodies in the shape of sessile, up to 3 mm wide apothecia, at first subglobous, later on turning into a flattened cup or sometimes discoidal. Hymenial surface smooth, concave or flat, sometimes umbilicate, reddish-brown. Margin well differentiated, even, but notched and crenulate when ripening rarely lobate, dark brown. Outer surface brownish, tomentose, sometimes also pruinose.
Spores 16.8-20.4 x (7.8) 8.4-9.4 µm (Q= 1.88-2.43; Q= 2.06), narrowly ellipsoidal, rarely subcylindrical, sometimes slightly inequilateral, rounded (sometimes hardly pointed) at the ends, hyaline, smooth, turning dotted when ripe, thick-walled, devoid both of oil drops and gaseous bubbles, regularly and obliquely uniseriate.
Asci non-amyloid, cylindrical, 8-spored, up to 180 µm long, 12-13 µm wide.
Paraphyses cylindrical, septate, slightly enlarged at the apex, branched.
Medullary excipulum of a **textura angularis**, made up of polygonal, light-walled hyphae.
Ectal excipulum of a ***textura globulosa-angularis***, with polygonal or roundish, 15-50 x 11-45 µm, thick- and brownish-walled hyphae. The outer and marginal hyphae are smaller and tendentially globous (7-12 x 7-9 µm). The whole outer surface is covered with brownish, hyphoid hairs, sinuous, septate, branched, rounded at the apex, thick-walled, sparser and shorter at the margin, often

fasciculate, 30- even more than 100 µm long, 3-6 µm wide.

Observations. ***P. cervaria*** is very close to ***Pseudombrophila theioleuca*** Rolland, from which it's distinguishable by the larger spore size and greater Q (length\width ratio) as well as by the brownish pigmentation of the hymenial surface. This latter is decidedly pale in ***P. theioleuca***.
Unfortunately the ***exsiccatum*** which we have received has not kept in a good condition, so that we have not been able clearly to appreciate some microscopical characteristics (among which the presence or the absence of extracellular or parietal pigments at the apex of the paraphyses). But the data which we possess enable us to make a specific diagnosis.
The specimens of the second collection (Valvestino) showed a paler, whitish-lilac hymenial surface and smaller (up to 1.2 mm wide) apothecia. Microscopically lighter hyphoid hairs, a larger (2.21) spore Q and paraphyses branched at the apex are observable. According to van Brummelen (1995), the third characteristic contributes to separate the species in subject from ***P. theioleuca***.

19) Pseudombrophila fuscolilacina (Grélet) Brumm., *Libri Botanici* 14: 36, 1995. ***Fig. 10***

≡ *Ascophanus fuscolilacinus* Grélet, *Bull. Trimest. Soc. Mycol. Fr*., 42: 205, 1926.

MATERIAL: **ITALY:** BRESCIA, Salò, 200 m, eight gregarious, superficial specimens on sheep (***Ovis aries***) dung, G. Medardi e C. Gallinaro, 2.1.98., 100.2.-Salò, CLSM 03698.

Apothecia 1-1.5 mm wide, sessile, at first subglobous, later on hemispherical, finally lenticular or discoidal, membraneous. Disc more or less flattened or even slightly convex, light purple-brown. Outer surface of the same colour or hardly darker, pruinose-felted. Margin well differentiated, at intervals involute and crenulate. Base lain upon a well developed whitish felt.
Spores 20.5-23 (24.5) x 11.5-12.6 µm, narrowly ellipsoidal, sometimes ovoidal elongated or subcylindrical (Q= 1.66-2.00; Q= 1.83), uniseriate, hyaline, cyanophile, containing a yellow material when ripe, smooth, thick-walled, rounded at the ends, devoid both of oil drops or de Bary's bubbles.
Asci 200-250 x 15-17 µm, 8-spored, non-amyloid, congophile, cylindrical, operculate, rounded at the apex, rather long-stalked.
Paraphyses filiform, 1-1.5 µm wide, very numerous and crowded, septate, ramified even more than once and at any level, often anastomosed and diverticulate, containing few uncoloured pigments, not embedded in a gelatinous material but surrounded by an intercellular light violet pigment, only few µm exceeding the asci, usually straight, practically not enlarged at the apex.
Subhymenium well differentiated, made up of very small roundish, polygonal or subcylindrical hyphae.
Medullary excipulum well developed, at the base 200-300 µm thick, of a ***textura intricata***, made up of cylindrical, hyaline, septate hyphae, 2-7 µm wide, running in all directions.
Ectal excipulum very thin even at the base, of a ***textura angularis***, made up of polygonal, thick-walled hyphae, 12-20 x 11-15 µm, with an intercellular purple-brown pigment.
Hairs of one kind, hyphoid, 2-4 µm wide, septate, ramified, often fasciculate, with parietal pigments, especially numerous at the base, where they build up a thin reticulum.

Observations. Our finding is sensational as this species, after Grélet's original description, has not been reported any more in literature. Except for the slightly smaller spores the characteristics of our collection fully agree with the entity named ***Ascophanus fuscolilacinus*** (= ***Pseudombrophila fuscolilacina***) by the french scholar (1932). But the revision of ***holotypus*** by van Brummelen

(1995) proved that the spore size is superimposable to our own. The closest species to ***P. fuscolilacina*** is ***Pseudombrophila hepatica*** (Batsch) Brumm., which however is distinguishable by the larger apothecia and spores (also the lenght/ width ratio is clearly larger in ***P. hepatica***), paraphyses very enlarged at the apex, ectal ***excipulum*** different in frame (van Brummelen 1962 e 1995).

20) Ascobolus immersus Pers. ex Pers.: Fr., *Syst. Mycol.* II: 164, 1823.

≡ *Ascobolus immersus* Pers., *Obs. Mycol. I*: 35, 1796.
≡ *Ascobolus immersus* Pers. ex Pers., *Mycol. Eur. I*: 341, 1822.
≡ *Dasyobolus immersus* (Pers. ex Pers.) Sacc., *Syll. Fung.*11: 421, 1895.
= *Ascobolus macrosporus* Crouan & Crouan, *Ann. Sci. Nat. (Bot.)* IV 7: 173, 1857.
= *Ascobolus gigasporus* De Not., *Comm. Soc. Critt. Ital.* 1: 360, 1864.
= *Ascobolus immersus* var. *brevisporus* Oudem., *Ned. Kruidk. Arch.* II 4: 262, 1885.
= *Ascobolus globularis* Rolland, *Bull. Soc. Mycol. Fr.* 4: 57, 1888.
= *Ascobolus immersus* var. *macrosporus* (Crouan & Crouan) Rehm, *Rab. Krypt.-Fl.* 3: 1128, 1896.
= *Boudiera globularis* (Rolland) Speg., *Anal. Mus. Nac. B. Aires* 6: 307, 1899.
= *Ascobolus megalospermus* Speg., *Anal. Mus. Nac. B. Aires* 6: 307, 1899 *(nom. conf.).*
= *Sphaeridiobolus globularis* (Rolland) Boud., *Hist. Class. Discom. Eur.:* 73, 1907.
= *Ascobolus immersus* var. *andinus* Speg., *Anal. Mus. Nac. B. Aires* 19: 452, 1909.
= *Ascobolus cuniculorum* Bat. & Pontual, *Bolm. Agr. Pernambuco* 15: 30, 1948.
= *Saccobolus exiguus* Bat. & Pontual, *Bolm. Agr. Pernambuco* 15: 33, 1948.
= *Seliniella macrospora* Arx & Müll., *Acta Bot. Neerl.* 4: 119, 1955.

MATERIAL: **ITALY: 1)** TRENTO, Malga di Fondo, 1400 m, thousands of gregarious specimens, often crowded, superficial or partly immersed in the substratum, that is bovine (***Bos taurus***) dung, F. Doveri, 17.9.94., 026.3-Fondo, CCD-Livorno 00594. **2)** PISA, manège of Calambrone, 0 m, dozens of gregarious specimens, usually crowded, on horse (***Equus caballus***) dung, F. Doveri, 10.96., 272.2-Marina di Pisa, CCD-Livorno 00594 bis. **3)** PISA, manège of Calambrone, on horse dung, F. Doveri, 18.2.97., 272.2-Marina di Pisa, CCD-Livorno 00594 ter. **4)** TREVISO, Scalon, 200 m, on sheep (***Ovis aries***) dung in culture, E. Bizio, 6.6.97., 083.1.-Valdobbiadene, CLSM 00594 quater. **5)** BELLUNO, Forcella Negher, 2300 m, on marmot (***Marmota marmota***) dung in culture, E. Bizio, 2.9.97., 045.1.-Cencenighe Agordino, CLSM 00594 penta. **6)** TRENTO, Laghestèl, 1.000 m, on horse dung in culture, F. Doveri, 25.9.97., 060.070-Baselga di Piné, CLSM 00594 esa. **7)** BERGAMO, Dossena, 1000 m, on cow dung in culture, A. De Vito, 21.8.97., 077.3.-San Pellegrino Terme, CLSM 00594 epta. **8)** GROSSETO, Principina Terra, 0 m, on horse dung in culture, F. Doveri, 2.4.98., 331.3.-Alberese, CLSM 00594 octo. **9)** GROSSETO, Principina Terra, 0 m, on rabbit (***Oryctolagus cuniculus***) dung in culture, F. Doveri, 2.4.98., 331.3.-Alberese, CLSM 00594 ena. **10)** COSENZA, Fossiata, 1400 m, on wolf (***Canis lupus***) dung in culture, C. Lavorato, 22.5.98., 560.1.-Monte Volpintesta, 00594 deca. **11)** COSENZA, Fossiata, 1400 m, on fox (***Vulpes vulpes***), dung in culture, C. Lavorato, 22.5.98., 560.1.-Monte Volpintesta, 00594 undeca. **12)** COSENZA, Orsomarso, 1300 m, on donkey (***Equus asinus***) dung in culture, C. Lavorato, 17.5.98., 533.2.-Mormanno, CLSM 00594 dodeca. **13)** VICENZA, Recoaro, 1000 m, on sheep dung in culture, A. Bizzi, 10.9.98., 102.2.-Recoaro Terme, CLSM 00594-XIII. **14)** MESSINA, Novara di Sicilia, on cervine dung, G. Robich, 11.11.98., 613.4.-Francavilla di Sicilia, CLSM 00594-XIV. **15)** MESSINA, Randazzo, 1800 m, on sheep dung, A. Bizzi, 612.2.-Randazzo, CLSM 00594-XV. **16)** COSENZA, Rossano, 700 m, on wild pig (***Sus scrofa***) dung in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 00594-XVI. **17)** COSENZA, Corigliano Calabro, 0 m, on sheep dung, C. Lavorato, 22.12.98., 544.3.-Sibari, CLSM 00594-XVII. **18)** BELLUNO, Forcella Negher, 2300 m, on steinbock (***Capra ibex ibex***) dung in culture, E. Bizio, 6.9.99, 045.1.-Cencenighe Agordino, CLSM 00594-XVIII. **19)** TRENTO, Malga Giumella (Valle di Pejo), 1700 m, on goat (***Capra hircus ?***) dung, M. Zugna, 8.9.99., 0411-Corno dei Tre Signori, CLSM 00594-XIX. **20)** TRENTO, Forcella Juribrutto, 2400 m, on sheep dung in culture, E. Bizio, 28.7.99., 045.4.-Soraga di Fassa, CLSM 00594-XX. **21)** AOSTA, Passo Salati, 2970 m, on steinbock dung in culture, L. Levorato, 21.8.99., 071.3-Gressoney la Trinité, CLSM 00594-XXI.

21) Ascobolus stictoideus Speg., *Michelia* 1: 474, 1879.

≡ *Ascobolus brunneus* var. *stictoideus* (Speg.) Heimerl, *Jber. kk. Ober-Realschule Bez. Sechshaus Wien* 15: 14, 1889.

MATERIAL: **ITALY: 1)** FERRARA, S. Giustina wood (Mesola), 0 m, dozens of gregarious specimens, almost fully immersed in horse (***Equus caballus***) dung, F. Bersan e G. Visentin, 3.5.97., 187.1.-Mesola, MCVE 580. **2)** ROVIGO, Porto Caleri, 0 m, about twenty gregarious specimens in culture on horse dung, F. Doveri, 5.97., 169.2.-Contarina, CLSM 00797 bis.

22) Ascobolus hawaiiensis Brumm., *Persoonia* suppl. 1: 87, 1967.

MATERIAL: **ITALY:** FERRARA, S. Giustina wood (Mesola), 0 m, dozens of gregarious, superficial specimens on horse (***Equus caballus***) dung in culture, F. Bersan e G. Visentin, 5.97., 187.1.-Mesola, MCVE 581.

23) Ascobolus mancus (Rehm) Brumm., *Persoonia (Suppl.)* 1: 84, 1967.

≡ *Ascobolus winteri* Rehm var. *mancus* Rehm, *Rabenh. Kryptog. Fl. (Pilze),* I (3): 1124, 1896.

MATERIAL: **ITALY: 1)** PISA, manège of Calambrone, 0 m, about ten gregarious, superficial specimens, on horse (***Equus caballus***) dung in moist chamber, F. Doveri, 30.11.95., 272.2-Marina di Pisa, MCVE 495. **2)** COSENZA, Orsomarso, 1300 m, on donkey (***Equus asinus***) dung in culture, C. Lavorato, 17.5.98., 533.2.-Mormanno, CLSM 00896 bis. **3)** COSENZA, Corigliano, 300 m, on goat (***Capra hircus***?) dung in culture, C. Lavorato, 16.5.98., 544.3.-Sibari, CLSM 00896 ter.

24) Ascobolus elegans J. Klein, *Verh. zool.-bot. Ges. Wien* 20: 566, 1870.

≡ *Ascophanus elegans* (J. Klein) Sacc., *Syll. Fung.* 10: 32, 1892.
= *Ascobolus winteri* Rehm, *Rab. Krypt.-Fl. (Pilze)* 3: 1124, 1896.
= *Ascobolus zukalii* Rehm, *Rab. Krypt.-Fl. (Pilze)* 3: 1129, 1896.

MATERIAL: **ITALY: 1)** GROSSETO, Farm "La Principina" (Resort Principina terra), 0 m, about one hundred gregarious, sometimes clustered, superficial specimens on horse (***Equus caballus***) dung in culture, F. Doveri, 14.3.96., 331.3-Alberese, MCVE 574. **2)** FERRARA, S. Giustina wood (Mesola), 0 m, on horse dung in culture, 5.97., F. Bersan e G. Visentin, 187.1.-Mesola, CLSM 01496 bis. **3)** GORIZIA, Cona island, 0 m, on horse dung in culture, F. Bersan, 8.97., 109.131.-Monfalcone, CLSM 01496 ter. **4)** GROSSETO, Principina Terra, 0 m, on horse dung in culture, F. doveri, 2.4.98., 331.3.-Alberese, CLSM 01496 quater.

25) Ascobolus brassicae Crouan & Crouan, *Ann. Sci. Nat. (Bot.)* 4 (7): 174, 1857. ***Fig. 11a,b***

= *Peziza murina* Fuckel, *Fungi rhenani* n° 1597, 1865.
= *Ascobolus caninus* Fuckel, *Hedwigia* 5: 3, 1866.
= *Peziza albofusca* Crouan & Crouan, *Fl. Finistère*: 54, 1867.
= *Plicaria murina* (Fuckel) Fuckel, *Jb. nassau. Ver. Naturk.* 23-24: 326, 1870.
= *Ascobolus hyperboreus* P. Karst., *Notis. Sällsk.Fauna Fl. Fenn. Förh.* 11: 204, 1870.
= *Ascobolus niveus* Quél., *Bull. Ass. Franc. Avanc. Sci.* 9: 14, 1881.
= *Phaeopezia murina* (Fuckel) Sacc., *Bot. Cbl.* 17: 218, 1884.
= *Ascobolus albofuscus* (Crouan & Crouan) Quél., *Ench. Fung.*: 295, 1886.
= *Humaria murina* (Fuckel) Quél., *Ench. Fung.*: 290, 1886.
= *Crouaniella murina* (Fuckel) Lambotte, *Fl. Mycol. Belg., suppl.* 1: 320, 1887.
= *Ascophanus boudieri* Renny in Phillips, *Brit. discom.*: 304, 1887.

≡ *Boudiera brassicae* (Crouan & Crouan) Sacc., *Syll. Fung.* 8: 513, 1889.
= *Phaeopezia albofusca* (Crouan & Crouan) Sacc., *Syll. Fung.* 8: 472, 1889.
= *Sphaeridiobolus hyperboreus* (P. Karst.) Heimerl, *Jber. k. k. Ober-Realschule Bez. Sechshaus Wien* 15: 12, 1889.
= *Boudiera hyperborea* (P. Karst.) Sacc., *Syll. Fung.* 8: 513, 1889.
= *Cubonia boudieri* (Renny) Sacc., *Syll. Fung.* 8: 528, 1889.
= *Boudiera canina* (Fuckel) J. Schröt., *Krypt.-Fl. Schles.* 3 (2): 55, 1893.
= *Boudiera kirschsteinii* Henn., *Verh. Bot. Ver. Prov. Brandenburg* 40: 26, 1898.
≡ *Sphaeridiobolus brassicae* (Crouan & Crouan) Boud., *Hist. Class. Discom. Eur.*: 74, 1907.
= *Sphaeridiobolus albofuscus* var. *murinus* (Fuckel) Boud., *Hist. Class. Discom. Eur.*: 74, 1907.
= *Sphaeridiobolus albofuscus* (Crouan & Crouan) Boud., *Hist. Class. Discom. Eur.*: 74, 1907.
= *Sphaeridiobolus hyperboreus* var. *niveus* (Quél.) Boud., *Hist. Class. Discom. Eur.*: 73, 1907.
= *Sphaeridiobolus kirschsteinii* (Henn.) Boud., *Hist. Class. Discom. Eur.*: 73, 1907.
= *Sphaeridiobolus niveus* (Quél.) Grélet, *Rev. Mycol.*9: 32, 1944.
= *Sphaeridiobolus murinus* (Fuckel) Moser in Gams, *Kleine Krypt.-Fl.* IIa: 116, 1963 (*nom. illeg.*).

MATERIAL: **ITALY:** COSENZA, Fossiata-Parco Nazionale Silano, 1400 m, about ten gregarious, superficial specimens on wolf (***Canis lupus***) dung, C. Lavorato, 22.5.98., 560.1.-Monte Volpintesta, CLSM 04798.

Apothecia 250-550 µm wide, pulvinate to discoidal, dirty whitish, more or less smooth, membraneous. Margin not differentiated. Hymenial surface slightly convex and hardly granulous.
Spores quite spherical, 11.5-13.1 (13.6) µm, in the early stages hyaline, smooth, bi- or triseriate, very thick-walled, containing a yellowish granulous material, later on light brown, usually uniseriate, devoid both of oil drops and gaseous bubbles, ornamented with roundish warts or truncate tubercles, dense but isolated, 0.5-1 µm wide, less than 1 µm high.
Asci 130-150 x 13-18 µm, 8-spored, fully and strongly amyloid, operculate, narrowly cylindrical to cylindrical-claviform, thick-walled, with a short aporynchous base and a dome-shaped apex, which is laterally marked by two short ear-shaped protuberances.
Paraphyses exceeding the asci, embedded in a dense, hyaline, gelatinous material, cylindrical-filiform, 1.5-2.5 µm wide, septate but not narrowed at the septa, very ramified, sometimes anastomosed, containing many yellowish vacuoles, straight or curved at the apex, which sometimes is enlarged up to 4-5 µm.
Subhymenium of a ***textura angularis***, made up of hyaline, 4-7 µm wide, polygonal hyphae.
Medullary excipulum slightly differentiated from the ectal one, of a ***textura globulosa-angularis***, made up of polygonal or roundish, thick-walled hyphae, 10-17 x 8-15 µm.
Ectal excipulum strongly cyanophile, of a ***textura globulosa-angularis***, made up of hyaline, thick-walled hyphae, 15-55 x 12-30 µm, turning rectangular on the sides and near the hymenial surface. At the base we can observe some septate, thick-walled, 3-4 µm wide, hyphoid hairs.

Observations. ***A. brassicae*** belongs to the section ***Sphaeridiobolus*** (Boud.) Brumm., which is characterized chiefly by round and warted spores. This ***taxon*** differs from ***Ascobolus nodulosporus*** Brumm. (another species with spherical spores) in the whitish rather than yellowish-brown fruit-bodies as well as in the smaller spores, ornamented with less coarse warts.
The apothecia and asci of our collection are slightly smaller than the ones described by most scholars we have consulted (Crouan & Crouan, 1857; van Brummelen, 1967; Otani & Kanzawa, 1970).
Often the species in subject has been observed on excrements of carnivores, particularly wolf (our collection), dog (Fuckel, 1866) and fox (Paulsen & Dissing, 1979).

26) Ascobolus albidus Crouan & Crouan, *Ann.Sci. Nat. (Bot.)* IV 10: 193, 1858. ***Pl. 1-b***

= *Ascobolus glaber* Pers. ex Pers.: Fr., ***ss.*** Cooke, *J. Bot., Lond.* 2: 151, 1864; ***ss.*** Boud., *Ann. Sci. Nat. (Bot.)* V 10: 223, 1869.

= *Ascobolus glaber* var. *lenticularis* Boud., *Ann. Sci. Nat. (Bot.)* V 10: 224, 1869.
= *Ascobolus glaber* var. *albidus* (Crouan & Crouan) Marchal, *Bull. Soc. Bot. Belg.* 34: 131, 1895.
= *Ascobolus albidus* Crouan & Crouan fo. *macrosporus* Svrcek, Ceská Mykol. 13: 211, 1959.

MATERIAL: **ITALY: 1)** PISA, manége of Calambrone, 0 m, about ten specimens, some of which crowded, on horse (***Equus caballus***) dung in culture, F. Doveri, 2.6.95., 272.2-Marina di Pisa, MCVE 480. **2)** 23.11.95., CCD-Livorno 01395. **3)** ROVIGO, Porto Caleri, 0 m, on horse dung in culture, F. Doveri, 5.97., 169.2.-Contarina, CLSM 01395 ter. **4)** FERRARA, S. Giustina wood (Mesola), 0 m, on horse dung in culture, F. Bersan e G. Visentin, 5.97., 187.1.-Mesola, CLSM 01395 quater. **5)** GROSSETO, Principina Terra, 0 m , on horse dung in culture, F. Doveri, 2.4.98., 331.3.-Alberese, CLSM 01395 penta. **6)** FERRARA, Mesola, 0 m, on deer (***Cervus elaphus***) dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 01395 esa.

27) Ascobolus aff. *cainii* Brumm., *Persoonia* suppl. 1: 126, 1967. ***Fig. 12***

MATERIAL: **ITALY:** UDINE, Forra di Fleons, 1400 m, about ten gregarious, superficial specimens on deer (***Cervus elaphus***) dung in culture, F. Bersan e F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 04998.

Apothecia sessile, 500-750 µm wide, 300-400 µm high, in the shape of upside down cone, turning flattened, membraneous. Outer surface light violet, especially near the margin covered with purple granules. Margin differentiated, hardly crenulate. Hymenial surface violet, granulous due to the protrusion of the ripe asci, slightly concave.
Spores uniseriate to irregularly biseriate, 13.6-15.2 x 6.8-7.8 µm, narrowly ellipsoidal (Q= 1.80-2.15; Q= 1.97), rounded at the ends, rather thick-walled, surrounded by gelatinous sheath, hyaline in the early stages, dark brown when ripe, dotted but also with the episporic pigment split into coarse, wart-like clusters.
Asci 120-150 x 15-17 µm, 8-spored, strongly amyloid, operculate, cylindrical-claviform, thick-walled, narrowed near the slightly flattened apex, with a lobate, rather long stalk.
Paraphyses cylindrical-filiform, 1-2 µm wide, sometimes ramified at the base, very crowded, septate, containing many yellowish vacuoles, embedded in a hyaline gelatinous material, exceeding the asci, often curved at the apex, wich usually appears clavate and enlarged up to 6-8 µm.
Subhymenium not differentiated from the ***medullary excipulum***.
Medullary excipulum of a ***textura subintricata***, made up of hyaline, cylindrical hyphae, perpendicular to the hymenium and mixed with polygonal or subglobous ones, 8-13 x 6-11 µm.
Ectal excipulum of a ***textura globulosa-angularis*** (at intervals ***epidermoidea***), made up of 6-23 x 4-13 µm hyphae, spaced out by plentiful, purplish intercellular pigment, turning cylindrical fasciculate near the margin and level with the granulations and ending by large claviform swellings, which are very similar to the apices of paraphyses.

Observations. The morphological characteristics of this species are such as to justify its arrangement among the entities which gravitate around ***Ascobolus cainii*** [***Ascobolus pseudocainii*** Prokhorov (1990); ***Ascobolus groenlandicus*** Dissing (1989)]. But in our opinion the ***taxon*** in subject is closer to ***A. cainii*** itself. In plate 2 the main features of the aforementioned species are compared.

	A. aff. ***cainii***	***A. cainii***	***A. pseudocainii***	***A. groenlandicus***
Apothecia	- 500-750 µm ∅.	- 400-800 µm ∅.	- 350-400 µm ∅.	- 200-350 µm ∅.

	- in the shape of upside down cone. - granulous. - light violet.	- in the shape of upside down cone. - scurfy. - white ?	- subcylindrical. - smooth ? - with violet shades.	- ovoidal. - scurfy. - whitish or purplish.
Spores	- 13.6-15.2 x 6.8-7.8 µm. - episporium finely dotted, but often with coarse clusters of pigment.	- 8.5-10 x 5-5.5 µm. - episporium finely granulous.	- 12.8-16 x 6.4-8 µm. - episporium warted.	- 16.5-19.8 x 8.6-10.6 µm. - episporium warted or spiny.
Asci	120-150 x 15-17 µm	65-80 x 9-11 µm	141-153 x 16-17 µm	140-180 x 20-27 µm.
Paraphyses	- enlarged at the apex up to 6-8 µm. - very pigmented.	- enlarged at the apex up to 4-6 µm. - hyaline.	- enlarged at the apex up to 5.8-6.9 µm. - hyaline.	- enlarged at the apex up to 3-4 µm. - hyaline.
Medullary exc.	*textura subintricata*	*textura intricata*	- ?	*textura intricata*.
Ectal excipulum	- *textura globulosa-angularis* (at intervals *epidermoidea.* - Bundles of cylindrical hyphae with claviform ends also present. - Intercellular pigment plentiful.	- *textura globulosa.* - Bundles of cylindrical hyphae present. - Pigment absent.	- *textura angularis.* - Bundles of cylindrical hyphae not described. - Pigment present.	- *textura globulosa* o angularis. - Bundles of cylindrical hyphae present. - Pigment present.
Habitat	Deer dung.	Deer dung.	Caucasian goat dung.	Musk ox, reindeer, sheep dung.

Plate 2. ***Ascobolus.*** aff. ***cainii*** **in comparison with the other similar species.**

28) Ascobolus roseopurpurascens Rehm, *Rab. Krypt.-Fl., (Pilze)* 3: 1122, 1896. ***Fig. 13***

= *Ascobolus vinosus* Berk. in Hook., *Engl. Fl.* 5 (2): 209, 1836, ***ss.*** Boud., *Ann. Sci. Nat. (Bot.)* 10: 221, 1869, ***et auct. plur***.

= *Ascobolus porphyrosporus* (Hedw.: Fr.) Fr., *Syst. Mycol.* 2: 163, 1822, ***ss.*** Fuckel, *Jb. nassau. Ver. Naturk.* 27-28: 57, 1873 (***nomen dubium)***.

MATERIAL: **ITALY:** TRENTO, Roncone, dozens of gregarious, often crowded, superficial specimens on excrements of an unidentified herbivore, G. Medardi & C. Gallinaro, 23.1.99., 079.1.-Pieve di Bono, CLSM 00499.

Apothecia 0.7-1 mm wide, up to 0.7 mm high, sessile, urceolate to subdiscoidal. Outer surface smooth, pink with light purple tinges. Margin well differentiated, even. Hymenial surface flat or slightly concave, more or less of the same colour, dotted due to the protrusion of the ripe asci.

Spores uni- or biseriate, 25.2-28.3 (32.5) x 12-13.5 µm, ellipsoidal-subfusiform but always with rounded ends (Q= 1.95-2.29; Q= 2.11), at first hyaline, soon quite dark brown. Episporium furrowed by longitudinal crevices (5 to 10 on each side), which often anastomose and consequently build up an almost complete reticulum. Gelatinous perisporium not observed.

Asci strongly amyloid, operculate, 8-spored, 160-200 x 27-33 µm, cylindrical-claviform, thick-walled, short-stalked, dome shaped at the apex.

Paraphyses cylindrical-filiform, 1.5-3 µm diam., septate, often ramified and diverticulate, containing several hyaline vacuoles, sometimes enlarged at the apex, exceeding the asci, seemingly devoid of intercellular purple pigment (vanished in the dried specimens ?), embedded in a thin gelatinous material.

Subhymenium and **medullary excipulum** of a ***textura angularis***, made up of polygonal hyphae, up to 10 µm diam.

Ectal excipulum of a ***textura angularis*** in the lower part of the receptacle, made up of 10-25 x 7-20 µm, thick-walled, polygonal hyphae, of a ***textura epidermoidea*** in the upper part, with hyphae running parallel to the hymenial surface. Intercellular purple pigment not observed.

Observations. In comparison with the other ***Ascobolus*** belonging to the section ***Ascobolus*** **t**his species is characterized by the purple-pinkish tinges of the apothecia. Particularly it differs from ***A. albidus*** in the ***textura epidermoidea*** of the ectal ***excipulum***. After Boudier (1869) the subject species has been described by many scholars under the misapplied name ***Ascobolus vinosus*** Berk. In fact Van Brummelen (1967; 1995) has proved that the type material of this ***taxon*** must be ascribed to ***Pseudombrophila hepatica*** (Batsch) Brumm., of wich consequently ***A. vinosus*** has to be considered as a synonym.

29) Ascobolus furfuraceus Pers.: Fr., Syst. Mycol. II: 163, 1823. ***Pl. 1-c***

= *Elvella fimetaria* Scop., *Ann. Hist. Nat.* 4: 149, 1770.
= *Peziza atra* Huds., *Fl. Angl.*: 637, 1778.
= *Peziza stercoraria* Bull., *Herb. Fr.*: tav. 376, 1787.
= *Peziza fusca* Bolton, *Hist. Fung. Halifax* 3: tav. 109, 1789.
= *Peziza stercoraria* var. *lutea* Bull., *Hist. Champ. Fr.:* 256, 1791.
= *Peziza stercoraria* var. *violacea* Bull., *Hist. Champ. Fr.:* 256, 1791.
= *Ascobolus pezizoides* Pers. *apud* J. F. Gmel., *C. Linn. Syst. Nat.* 2: 1461, 1791.
= *Peziza violacea* (Bull.) Relhan, *Fl. Catabrigiensis, Suppl.* 3: 31, 1793.
≡ *Ascobolus furfuraceus* Pers., *Obs. Mycol.* 1: 33, 1796.
= *Ascobolus marginatus* Schumach., *Enum. Pl. Saell.* 2: 437, 1803.
= *Ascobolus aerugineus* Fr., *Syst. Mycol.* II: 165, 1823.
= *Peziza fimiputris* Fr. *apud* Weinm., *Hym. Gastrom. Ross.*: 426, 1836.
= *Peziza subrugulosa* P. Karst., *Syn. Pez. Ascob.*7, 1861.
= *Ascobolus furfuraceus* var. *nudus* J. J. Kickx, *Fl. Crypt. Flanders* 1: 479, 1867.
= *Ascobolus furfuraceus* var. *coronatus* Boud., *Ann. Sci. Nat. (Bot.)* V 10: 220, 1869.
= *Ascobolus fimiputris* (Fr.) Quél., *Ench. Fung.*: 293, 1886.
= *Ascobolus furfuraceus* var. *fallens* Heimerl, *Jber. k. k. Ober-Realsch. Bez. Sechsh. Wien* 15: 13, 1889.
= *Ascobolus stercorarius* (Bull.) J. Schröt., *Krypt.-Fl. Schles.* 3 (2). 56, 1893.
= *Ascobolus stercorarius retisporus* Clem., *Bot. Surv. Nebraska* 5: 9, 1901.
= *Ascobolus stercorarius* var. *fimiputris* (Fr.) Boud., *Hist. Class. Discom. Eur.:* 72, 1907.
= *Ascobolus stercorarius* var. *nudus* (J. J. Kicks) Boud., *Hist. Class. Discom. Eur.*: 72, 1907.
= *Ascobolus stercorarius* var. *coronatus* (Boud.) Boud., *Hist. Class. Discom. Eur.* 72, 1907.
= *Ascobolus glaber* var. *caprea* Beeli, *Bull. Soc. Roy. Bot. Belg.* 54: 61, 1924.
= *Ascobolus stercorarius* var. *pusillus* Velen., *Monogr. Discom. Boh.*: 365, 1934.
= *Ascobolus minor Velen.*, *Monogr. Discom. Boh.: 365, 1934.*
= *Ascobolus furfuraceus* var. *fimiputris* (Fr.) Grélet, *Rev. Mycol.* 9: 22, 1944.

MATERIAL: **ITALY:** LIVORNO: Botro delle Fontanelle, 200 m, dozens of gregarious, sometimes crowded specimens on bovine (***Bos taurus***) excrements, F. Doveri, **1)** 29.10.92., 284.4-Collesalvetti, A.M.B.-Livorno 12692. **2)** 29.8.93. **3)** 2.94. **4)** UDINE, Passo delPura, 1450 m, on marten (***Martes martes***) dung, F. Bersan, 11.9.97., 031.3.-Ampezzo, CLSM 12692 bis. **5)** TRENTO, Rifugio Panarotta, 1800 m, on cow dung, A. De Vito, 25.9.97., 060.120.-Frassilongo, CLSM 12692 ter. **6)** TRENTO, Rifugio Marzola, 1800 m, on roe deer (***Capreolus capreolus***) dung in culture, M. Floriani, 26.9.97., 060.120.-Frassilongo, CLSM 12692 quater. **7)** TREVISO, Scalon, 230 m, on sheep (***Ovis aries***) dung in culture, E. Bizio, 6.6.97., 083.1.-Valdobbiadene, CLSM 12692 penta. **8)** BERGAMO, Dossena, 900 m, on cow dung, A. De Vito, 7.9.97., 077.3.-San pellegrino Terme, CLSM 12692 esa. **9)** GROSSETO, Principina Terra, 0 m, on cow dung in culture, F. Doveri, 2.4.98., 331.3.-Alberese, CLSM 12692 epta. **10)** PORDENONE, Frisanco, 500 m, 18.6.98., on deer dung in culture, G. Zecchin, 18.6.98., 065.4.-Maniago, CLSM 12692 octo. **11)** VICENZA, Nogarole Vicentino (Monte Faldo), 600 m, on horse (***Equus caballus***) dung in culture, A. Bizzi, 1.9.99., 124.1-Arzignano, CLSM 12692-ena.

30) Ascobolus crenulatus P.Karst., *Fungi Fenn.Exs.*763, 1868. ***Pl. 2-f***

= *Ascobolus viridulus* Phill. & Plowr., *Grevillea* 8:103,1880.
= *Ascobolus microsporus* Velen., *Monogr.Discom.Boh.* 1:365,1934.

MATERIAL: **ITALY: 1)** BRESCIA: Collebeato, 300 m, dozens of gregarious, superficial specimens, many of which crowded, on dung of an unidentified herbivore, G. Medardi, 5.92., 121.1-Brescia, MCVE-ERB2 10752. **2)** ROVIGO, Rosolina mare, 0 m, on regurgitation of bird, G. Medardi, 17.4.99., 169.2.-Contarina, CLSM 02896 bis. **3)** ROVIGO, Isola di Albarella, 0 m, on dung of an unidentified carnivore in culture, G. Robich, 14.5.99., 170.3.-Porto Levante, CLSM 02896 ter. **4)** MODENA, Zocca, 750 m, on hedgehog (***Erinaceus europaeus***) dung in culture, L. Piccioli, 12.99., 237.4-Savigno, CLSM 02896 quater.

31) Ascobolus costantinii Rolland, *Bull. Soc. Mycol. Fr.* 4: 56, 1888.

= *Ascobolus schweersii* Maas Geest., Fungus 24: 13, 1954.

MATERIAL: **ITALY:** ROVIGO, Porto Caleri, 0 m, about thirty gregarious specimens in culture on excrements of an unidentified animal, F. Doveri, 5.97., 169.2.-Contarina, MCVE 582.

32) Saccobolus aff. *truncatus* Velen., *Monogr. Discom. Boh.* 1: 370, 1934. ***Fig. 14a,b***

MATERIAL: **ITALY:** GROSSETO, Principina terra, 0 m, eight isolated, superficial specimens, hidden in niches of the substratum which is cow (***Bos taurus***) dung in culture, F. Doveri, 2.4.98., 331.3-Alberese, CLSM 03298.

Apothecia sessile, 150-250 µm wide, emispherical or cup-shaped, dark yellow, smooth, membraneous, with a practically not differentiated margin. Hymenial surface more or less of the same colour, granulous due to the protruding asci.
Unripe **spores** hyaline, rhomboidal, free inside the ascus. Ripe spores violet to dark brown, clustered, 16.8-18.3 (18.9) x 9.5-10.5 µm, ellipsoidal (Q= 1.60-1.88; Q= 1.79), usually equilateral, rounded at the ends, with an episporium unglued at intervals, dotted and sometimes cracked, as well as uncoloured where it reciprocally touches. Spore clusters 34-40 (50) x 19-24 µm, surrounded by a narrow gelatinous sheath, inside which spots of episporic pigment are observable: the spores are arranged on two longitudinal planes of symmetry, they are rather conglobate, but during the late stages turn again to become free.
Asci 120-132 x 22-29 µm, amyloid, operculate, 8-spored, claviform, thick-walled, flattened at the apex, rather long-stalked.
Paraphyses 1.5-2 µm wide, exceeding the asci, not embedded in a gelatinous material, septate, usually ramified, containing many yellowish pigments, slightly clavate at the apex.
Subhymenium not differentiated from the medullary ***excipulum*.**
Medullary excipulum of a ***textura globulosa***, made up of hyaline, roundish or subcylindrical, 7-15 x 4-9 µm hyphae.
Ectal excipulum of a ***textura globulosa-angularis***, made up of roundish or polygonal, 10-20 x 8-16 µm hyphae, with parietal yellowish pigments, turning to lenghten and finally to become claviform (similar to the paraphyses) near the margin.

Observations. The species in subject undoubtedly belongs to the section ***Saccobolus***, which after van Brummelen (1967) is characterized by more or less deep yellow apothecia, paraphyses containing pigments of such a colour, spores arranged in four rows and on two longitudinal planes

of symmetry (= "pattern I or Ia" according to the dutch scholar). Inside this section our species can be placed between ***Saccobolus truncatus*** (as described by van Brummelen *l.c.*) and ***S. succineus*** Brumm. (1969). Like the former it shows, as well as ellipsoidal and equilateral spores, rounded at the ends, also rather deep yellow apothecia, which develop isolated in niches of the substratum, so that they are hardly observable. But the ascus size and spore width are closer to ***S. succineus***.
We think useful to mention the spore arrangement inside the ascus, which in our case isn't fully superimposable to van Brummelen's pattern I, but characterized by a lesser symmetry and on the contrary by a larger tendency to the conglobation. Moreover the spores, free in the early stages, turn to regain such a state when over-ripe. Consequently the spore clusters, usually shortened when ripe, afterwards turn to lengthen.
Anyway we think that at the moment a little confusion has been created about ***S. truncatus***, of which therefore we report Velenovsky's (1934) original diagnosis:
"*Ap. 0.2-0.5 mm, dense gregaria, crasse patellaria, dein lentina, sessilia, glabra, vinoso-lutea, nigro-punctata. As. 50-60 x 25, late cuncati, antice late truncati, non strangulati, basi valde breviter pedicellati et bilobi, par. filif., ramosae, apice dilatatae, succo luteo impletae. Sp. 12-15, oblongo-ellipticae, laeves, in glomerulo (30) oblongo cohaerentes, violaceae.*"
We are convinced that the very short asci and the comparatively small spores are the main ***typus*** features but the sizes reported by most consulted authors (van Brummelen, 1967; Larsen, 1970; Thind & Waraitch, 1970; Rattan & El-Buni, 1979; Prokhorov, 1989; Abdullah & Alutbi, 1993) are conflicting, that is to say larger. There isn't agreement even about the spore shape: "*..with blunt ends*", sec. van Brummelen (1967); "*..truncate-elliptical*" sec. Larsen (*l.c.*); "*..with truncate ends*" sec. Prokhorov (1990).

33) Saccobolus minimus Velen., *Monogr. Discom. Boh.*: 370-371, 1934.

MATERIAL: **ITALY: 1)** PISA, manège of Calambrone, 0 m, hundreds of gregarious specimens,, many of which crowded, on horse (***Equus caballus***) dung in culture, F. Doveri, 6.95., 272.2-Marina di Pisa, MCVE 491. **2)** COSENZA, Corigliano Calabro, 300 m, on goat (***Capra hircus*** ?) dung in culture, C. Lavorato, 16.5.98., 544.3.-Sibari, CLSM 02495 ter. **3)** VICENZA, Sarego, 250 m, on horse dung in culture, A. Bizzi, 20.8.99., 025.3-Longare, CLSM 02495 quater.

34) Saccobolus citrinus Boud. & Torrend, *Bull. Soc. mycol. Fr.* 27: 131, 1911. ***Fig.15***

MATERIAL: **ITALY: 1)** FERRARA, S. Giustina (Mesola), 0 m, about ten gregarious, superficial specimens on deer (***Cervus elaphus***) dung in culture, A. Bizzi & G. Zecchin, 18.4.99., 187.1.-Mesola, CLSM 01299. **2)** ROVIGO, Albarella isle, 0 m, on deer dung in culture, G. Robich, 14.5.99., 170.3.-Porto Levante.

Apothecia 170-200 µm diam., sessile, pulvinate to almost discoidal, with a not differentiated margin. Outer surface bright yellow, smooth. Hymenial surface more or less of the same colour, dark dotted due to the protrusion of the ripe asci.
Spores 19.9-22 x 8.9-9.4 µm, ellipsoidal-subfusiform (Q= 2.11-2.47; Q= 2.28), often slightly asymmetrical, flattened at the ends, thick-walled, hyaline in the early stages, later on violet, finally purple brown, finely warted, clustered and arranged according to van Brummelen's pattern I (see ***Saccobolus aff. truncatus***). Spore clusters 47-54 x 16-18 µm, surrounded by a gelatinous sheath.

Asci 8-spored, amyloid, congophile, unitunicate, claviform, 105-114 x 27-32 µm, thick-walled, flattened at the apex, very short stalked.
Paraphyses simple or furcate at the base, seemingly not embedded in a gelatinous material, exceeding the asci, cylindrical-filiform, septate, 2-2.5 µm diam., containing many yellow pigments, straight or slightly curved at the apex, which is enlarged up to 5 µm.
Subhymenium and **medullary excipulum** not differentiated from the **ectal excipulum**. This latter very thin, of a ***textura globulosa***, made up of light yellow, 5-7 µm diam., roundish hyphae, which turn cylindrical near the margin, arranging themselves in dense rows.

Observations. The lemon-yellow colour and the very small size of the apothecia as well as the spore arrangement, shape and kind of ornamentation characterize this species very well.
Saccobolus diffusus Kaushal & Virdi is a ***taxon*** very close to ***S. citrinus***, from which it's distinguishable by the slightly larger (20.5-24.5 x 9-10.5 µm), not ornamented spores .

35) Saccobolus glaber (Pers.: Fr.) Lambotte, *Fl. Mycol. Belg*., suppl.1: 284, 1887.

≡ *Ascobolus glaber* Pers., *Obs.Mycol.*1: 34, 1796.
= *Ascobolus kervernii* Crouan & Crouan, *Ann. Sc. Nat.(Bot.)* IV 10: 193, 1858.
= *Saccobolus kervernii* (Crouan & Crouan) Boud., *Ann. Sc. Nat. (Bot.)* V 10: 229, 1869.
= *Saccobolus granulispermus* Soppitt & Crossl., *Naturalist*, 1899.
≡ *Ascobolus stercorarius* (Bull. ex St. Amans) J. Schröt. var. *glaber* (Pers.: Fr.) Velen., *Monogr. Discom. Boh.*1: 365, 1934.

MATERIAL: **ITALY: 1)** BRESCIA: Lavenone, 400 m, dozens of gregarious, superficial specimens, some of which crowded, on excrements of unidentified herbivore, G. Medardi, 4.91., 100.4-Vestone, MCVE-ERB2 10748. **2)** COSENZA, San Demetrio Corone (Contrada Poggio), 600 m, on pig (***Sus scrofa***) dung in culture, C. Lavorato, 16.5.98., 552.4.-San Demetrio corone, CLSM 02596 ter.

36) Saccobolus dilutellus (Fuckel) Sacc., *Syll. Fung.* 8: 526, 1889. ***Fig. 16***

≡ *Ascobolus dilutellus* Fuckel, *Hedwigia* 5: 4, 1866.
= *Saccobolus globulifer* Boud., *Ann. Sci. Nat. (Bot.)* V (10): 232, 1869.
= *Ascobolus globulifer* (Boud.) Gillet, *Champ. Fr., Discom.*: 142, 1883.
= *Ornithascus corvinus* Velen., *Monogr. Discom. Boh.* 1: 369, 1934.

MATERIAL: **ITALY:** ROVIGO, Porto Caleri, 0 m, dozens of gregarious, superficial specimens on wild rabbit (***Oryctolagus cuniculus***) dung, E. Bizio, 22.11.97., 169.2.-Contarina, CLSM 01098.

Apothecia discoidal, 200-300 µm wide, white translucid, membraneous, smooth. Margin not differentiated. Hymenium flat, violet dotted due to the protrusion of the ripening asci.
Spores clustered inside the asci (unripe spores free) and arranged according to van Brummelen's pattern IV, at first hyaline, later on light violet, purple brown when ripe, (12) 12.6-13.6 (14) x 6.3-6.8 µm, ellipsoidal-subfusiform (Q= 1.85-2.32; Q= 2.03), often slightly unequilateral or even subtriangular, slightly pointed at the ends, thick-walled. Episporium ornamented with thin or coarse, 0.5-2.0 µm wide, 0.5-1.5 µm high warts, that usually are more crowded and higher at the ends, isolated or rarely merged into short ridges, absent in the part which touches the other spores. Gelatinous envelope not observed. Spore clusters subglobous or ellipsoidal, 23-30 x 17-20 µm.
Asci amyloid, operculate, 8-spored, 44-66 x 21-24 µm, clavate-sacciform, thin-walled, slightly flattened at the apex, very short-stalked.

Paraphyses cylindrical-filiform, 1.5-2.0 µm wide, not covered with a gelatinous material, exceeding the asci, ramified or not, septate, containing scarce hyaline vacuoles, up to 3 µm enlarged at the apex.
Subhymenium not well definable.
Excipulum not differentiated in medullary and ectal ones, of a ***textura globulosa-angularis***, made up of 5-7 µm wide, globous or polygonal hyphae, which turn subcylindrical towards the periphery.

Observations. ***S. dilutellus*** is a species very similar to ***S. globuliferellus*** Seaver (they even could be considered as forms of the same ***taxon***), from which it's distinguishable by the more compact spore clusters and also by the spore ornamentation, which is restricted to the exposed surface rather than fully arranged (Seaver, 1928). According to Larsen (1970) these two species differ from each other also in the ascus (slender in the former, obpyriform in the latter) and spore shape (more asymmetrical in ***S. dilutellus***).

37) Saccobolus beckii Heimerl, *Jahresb. K. K. Ober-Realschule Bezirke Sechshaus Wien* 15: 18, 1889. ***Fig. 17***

MATERIAL: **ITALY: 1)** UDINE, Forra di Fleons, 1400 m, dozens of superficial, gregarious specimens on chamois (***Rupicapra rupicapra***) dung in culture, F. Bersan e F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 04898. **2)** UDINE, Val Bruna, 1700 m, on deer (***Cervus elaphus***) dung, A. Bizzi, 28.6.98., 033.4.-Malborghetto Valbruna, CLSM 04898 bis. **3)** BELLUNO, Tambre d'Alpago, on deer dung in culture, A. Bizzi, 18.7.98., 064.4.-Farra d'Alpago, CLSM 04898 ter. **4)** FERRARA, Mesola, 0 m, on deer (***Cervus elaphus***) dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 04898 quater. **5)** TRENTO, Cort Montagne, 1100 m, on roe deer (***Capreolus capreolus***) dung, M. Castoldi & G. Robich, 3.5.99., 059.3.-Tione di Trento, CLSM 04898 penta.

Apothecia 300-500 µm wide, pulvinate, turning discoidal, membraneous, smooth, whitish with violet shades. Hymenial surface more or less of the same colour, granulous due to the protrusion of the ripe asci. Margin not differentiated.
Spores (19.4) 20-21 (22) x 8.9-10 µm (ornamentations excluded), (sub)fusiform (Q= 2.00-2.47; Q= 2.20), usually ventricose and inequilateral, slightly pointed at the ends, hyaline and thick-walled in the early stages, later on dark brown, at first free inside the ascus, when ripe crowded and constantly arranged according to van Brummelen's pattern II (1967), that is to say on three rows and only one plane of simmetry (spore clusters 50-60 x 18-24 µm, with an unilateral gelatinous sheath), ornamented with coarse roundish warts or shapeless crusts of pigment, even more than 3 µm high and wide.
Asci 117-130 x 33-37 µm, amyloid, 8-spored, operculate, broadly clavate, thick-walled, slightly narrowed and flattened at the apex, with a short, lobate stalk.
Paraphyses 1.5-2.5 µm wide, cylindrical-filiform, septate, often ramified, not embedded in a gelatinous material, without pigmented vacuoles but with a thin, violet, intercellular pigment, exceeding the asci, enlarged at the apex up to 6 µm.
Subhymenium made up of very small polygonal or narrowly cylindrical hyphae.
Medullary excipulum not differentiated from the ectal one.
Ectal excipulum of a ***textura globulosa-angularis***, made up of roundish, 5-20 x 5-14 µm, polygonal hyphae with intercellular violet pigments. Also observable are some elongated hyphae, which show globous or claviform ends, similar to the paraphyses but more thick-walled.

Observations. ***S. beckii*** is identifiable inside the section ***Eriobolus*** Sacc. (white or violet apothecia, paraphyses devoid of yellowish pigments) by the comparatively large spores, ornamented with coarse warts or crusts and arranged according to van Brummelen's pattern II.

S. verrucisporus Brumm. is a close species, which however is distinguishable by the cylindrical ripe apothecia as well as by the smaller spores, narrowly ellipsoidal rather than fusiform and ornamentated with less coarse warts. In turn ***S. verrucisporus*** var. ***longisporus*** S. C. Kaushal & Virdi (1986) differs from the ***typus*** variety especially in the larger spores and spore clusters, from ***S. beckii*** in the ellipsoidal rather than fusiform spores and the ***excipulum*** with a ***textura globulosa-angularis*** rather than intermediate between ***epidermoidea*** and ***intricata***. But let us mention that Gamundi & Ranalli (1969) dealt with ***S. beckii*** as a species with a ***textura globulosa***: this disagreement with van Brummelen's (1967) description results from the "poor condition" of the slides representing the type material [in the protologue (Heimerl,1889) the ***excipulum*** is not mentioned] and from the probable existence of varieties (or forms) or even intermediates between ***S. beckii*** and ***S. verrucisporus***, as for example the var. ***longisporus*** and our collection. In fact the main features of the specimens which we have described are superimposable to ***S. beckii***, even if the asci are smaller and the ***excipulum*** is equal to ***S. verrucisporus*** var. ***longisporus***.

38) Saccobolus aff. verrucisporus Brumm., *Persoonia* suppl. 1: 198, 1967. ***fig. 18***

MATERIAL: **ITALY:** BELLUNO, Tambre d'Alpago, Foresta del Cansiglio (Loc. Campon), 1000 m, ten gregarious, superficial specimens, on cervine dung, A. Bizzi, 17.7.99., 064.4-Farra d'Alpago, CLSM 02799.

Ascomata 90-150 µm diam., containing 5-10 asci, sessile, subglobous, with an undifferentiated margin. Outer surface whitish, almost smooth. Hymenial surface dark violet dotted due to the protrusion of ripe asci.
Spores clustered inside the asci according to van Brummelen's pattern II, (12.3) 12.8-13.7 (14.2) x 5.7-6.4 µm, ellipsoidal-subfusiform (Q= 2.00-2.41; Q= 2.19), symmetrical to subtriangular, sometimes slightly ventricose, rounded at the ends, thick-walled, hyaline in the early stages, later on violet, finally dark brown, ornamented with isolated or rarely merging, roundish warts, which are punctiform to 2.5 µm wide and 1 µm high. Spore clusters 36-38 x 12-14 µm, not turning to shorten at maturity, provided with an unilateral gelatinous sheath.
Asci 73-86 x 18-21 µm, 8-spored, amyloid, congophile, unitunicate, claviform, thick-walled, flattened at the apex, short-stalked.
Paraphyses cylindrical-filiform, mixed with the asci and exceeding them, not embedded in a gelatinous material, without intercellular pigments, 1-2 µm diam., hardly enlarged at their apex, septate, often ramified, containing a few hyaline vacuoles.
Excipulum not differentiated in medullary and ectal ones, of a ***textura globulosa-angularis***, made up of 3-9 µm diam., not pigmented, roundish cells.

Observations. Undoubtedly this species belongs to sect. ***Eriobolus*** Sacc. (whitish or violet apothecia, spores not arranged according to van Brummelen's pattern I or Ia, paraphyses devoid of yellowish pigments), particularly to a group of ***taxa*** characterized by more or less coarsely warted spores [***S. beckii*** Heimerl; ***S. obscurus*** (Cooke) Phill.; ***S. thaxteri*** Brumm.; ***S. verrucisporus*** Brumm.; ***S. tuberculatus*** Aas; ***S. parvisporus*** Brumm.], but its morphological features don't fully match the ones of any above mentioned entity.
In opposition to ***S. thaxteri*** the specimens of our collection show spores slightly different in shape and ornamented with coarser warts as well as spore clusters not shortened at maturity.
In comparison with ***S. obscurus*** the spores, a bit different in shape, are even slightly smaller and the apothecia are whitish and globous rather than dark and pulvinate.
S. tuberculatus (Aas, 1978) has larger spores and spore clusters with two polar gelatinous sheaths.
In ***S. beckii*** the spores are comparatively larger and covered with a thicker (up to 3 µm) pigment.

S. parvisporus (Brummelen, 1976) possesses smaller spores and very long stalked asci.
On the whole the species which we have studied is closer to ***S. verrucisporus*** (due to the ascoma's size and shape and arrangement of the spore clusters), which however differs in the slightly larger spores and asci as well as in the slightly pigmented ***excipulum***, made up of a ***textura intricata***.
However the size of the asci, spores and spore clusters mentioned by Larsen (1970) are very close to our own. Moreover we report that also Wang (1993) has described a collection of ***S. verrucisporus*** with an ***excipulum*** of a ***textura angularis*** rather than ***intricata***.

39) Saccobolus caesariatus Renny apud Phill., *Brit. Discom.*: 297, 1887. ***fig.19***

MATERIAL: **ITALY:** TRENTO, Forcella Juribrutto, 2400 m, about fifty gregarious, superficial specimens, on sheep (***Ovis aries***) dung in culture, E. Bizio, 28.7.99., 045.4.-Soraga di Fassa, CLSM 02299.

Ascomata 200-500 µm diam., sessile, pulvinate to discoidal, with undifferentiated margin. Outer surface whitish, densely covered with hairs, which often become fasciculate, building up triangular little scales. Hymenial surface dotted due to the protrusion of the ripe asci.
Spores (16.8) 17.8-18.9 (19.9) x 7.3-8.4 µm, ellipsoidal-subfusiform (Q= 2.12-2.71; Q= 2.31), symmetrical to subtriangular, usually rounded at the ends, thick-walled, hyaline in the early stages, later on violet, brown at maturity, almost smooth to finely dotted, clustered inside the asci and arranged according to van Brummelen's pattern II. Spore clusters 47-52 x 12-15 µm, with an unilateral gelatinous sheath.
Asci 112-133 x 21-33 µm, 8-spored, amyloid, congophile, unitunicate, claviform, thick-walled, flattened at the apex, quite long-stalked.
Paraphyses cylindrical-filiform, 1.5-2 µm diam., usually forked at the base, septate, containing a few hyaline vacuoles, not- or hardly enlarged at the apex, exceeding the asci, not embedded in a gelatinous material, without intercellular pigments.
Medullary excipulum not differentiated from the ectal one.
Ectal excipulum of a ***textura globulosa-angularis***, with 5-8 µm diam., not pigmented, roundish or polygonal cells.
Hairs hyaline, wavy, septate, 2-3 µm diam., rounded at their apex, sometimes forked and anastomized.

Observations. According to van Brummelen (1967, *l.c.*) and also in our opinion ***S. caesariatus***, a rare species which especially develops on sheep and rabbit dung, is probably an extreme form of ***S. versicolor***, from which it differs almost exclusively in the presence of hairy clusters on the outer surface of receptacles. But we aren't so sure, after having read the protologue, that ***Saccobolus subcaesariatus*** J. Moravec (1970) has to be considered an independent ***taxon*** at the species rank, as the differential features in comparison with both ***S. caesariatus*** and ***S. versicolor*** are very slight.

40) Saccobolus versicolor (P. Karst.) P. Karst., *Acta Soc. Fauna Fl. Fenn.* 2 (6): 123, (1885).

≡ *Ascobolus versicolor* P. Karst., *Fungi Fenn.* N° 659, 1867.
= *Saccobolus violascens* Boud., *Ann. Sci. Nat. (Bot.)* 5 (10): 230, (1869).
= *Saccobolus boudieri* Oudem., *Hedwigia* 21: 166, 1882.
= *Ascobolus violascens* (Boud.) Gillet, *Champ. Fr., Discom.*:141, 1883.
= *Saccobolus pseudo-violascens* Heimerl, *Jber. k. k. Ober-Realsch. Bezirke Sechsh. Wien* 15: 19, (1889).
= *Saccobolus neglectus* var. *fallax* Heimerl, *Jber. k. k. Ober-Realsch. Bezirke Sechsh. Wien* 15: 17, 1889.
= *Saccobolus violascens* var. *boudieri* (Oudem.) Velen., *Monogr. Discom. Boh*.: 370, (1934).
= *Saccobolus murinus* Velen., *Monogr. Discom. Boh*.: 371, 1934.

MATERIAL: **ITALY:** TRENTO, Val Brenta, 1000 m, dozens of gregarious specimens on bovine (***Bos taurus***) dung, G. Medardi, 5.96., 042.3-Madonna di Campiglio, MCVE 578. **2)** VENEZIA, Alberoni, 0 m, on wild rabbit (***Oryctolagus cuniculus***) dung in culture, E. Bizio, 5.97., 148.1.-Alberoni, CLSM 04696 bis. **3)** VENEZIA, Caroman, 0 m, on wild rabbit dung in culture, F. Doveri, 5.97., 148.2.-Chioggia, CLSM 04696 ter. **4)** TRENTO, rifugio Panarotta, 1800 m, on cow dung in culture, A. De Vito, 25.9.97, 060.120.-Frassilongo, CLSM 04696 quater. **5)** COSENZA, Orsomarso, 1300 m, on donkey (***Equus asinus***) dung in culture, C. Lavorato, 17.5.98., 533.2-Mormanno, CLSM 04696 penta. **6)** UDINE, Monte Crostis, 2000 m, on cow dung in culture, F. Bersan, 26.6.98., 031.1.-Fontana Panzit, CLSM 04696 esa. **7)** COSENZA, Fossiata, 1400 m, on wolf (***Canis lupus***) dung in culture, C. Lavorato, 22.5.98., 560.1.-Monte Volpintesta, CLSM 04696 epta. **8)** CATANIA, Parco dell'Etna, 1200 m, on wild rabbit dung, G. Robich, 9.11.98., 612.2.-Randazzo, CLSM 04696 octo. **9)** TRENTO, Cort Montagne, 1100 m, on roe deer (***Capreolus capreolus***) dung, M. Castoldi & G. Robich, 3.5.99., 059.3.-Tione di Trento, CLSM 04696 ena.

41) Saccobolus depauperatus (Berk. & Broome) E. C. Hansen, *Vidensk. Meddel. Dansk Nathurist. Foren.* 1876: 87, 1876.

≡ *Ascobolus depauperatus* Berk.& Broome, *Ann. Mag. Nat. Hist. III* 15: 448, 1865.
= *Saccobolus neglectus* Boud., *Ann. Sci. Nat. (Bot.)* V 10: 231, 1869.
= *Ascobolus neglectus* (Boud.) Phill. & Plowr., Grevillea 10: 69, 1881.
= *Ascobolus violascens* (Boud.) Gillet var.*neglectus* (Boud.) Quél., *Ench. Fung.*: 294, 1886.
= *Saccobolus depauperatus* fo. *denigratus* Rehm, *Ascom. exs.* n° 1271, 1899 (***nomen nudum***).
= *Saccobolus aparaphysatus* Speg., *An. Mus. Nac. B. Aires* 6: 308,1899.

MATERIAL: **ITALY:** PISA, manège of Calambrone, 0 m, dozens of gregarious speimens, many of which crowded, on horse (***Equus caballus***) dung in culture, F. Doveri, 9.95., 272.2-Marina di Pisa, **1)** MCVE 492. **2)** 28.11.95., CCD-Livorno 03195. **3)** ROVIGO, Porto Caleri, 0 m, on horse dung in culture, F. Doveri, 5.97., 169.2.-Contarina, CLSM 03195 ter. **4)** GORIZIA, Cona isle, 0 m, on horse dung in culture, F. Bersan, 8.97., AMB 6143 and CLSM 03195 quater. **5)** TREVISO, Scalon, 200 m, on sheep (***Ovis aries***) dung in culture, E. Bizio, 6.6.97., 083.1.-Valdobbiadene, CLSM 03195 penta. **6)** BELLUNO, Forcella Negher, 2300 m, on marmot (***Marmota marmota***) dung in culture, E. Bizio, 2.9.97., 045.1.-Cencenighe Agordino, CLSM 03195 esa. **7)** GROSSETO, Principina Terra, 0 m, on horse dung in culture, F. Doveri, 2.4.98., 331.3.-Alberese, CLSM 03195 epta. **8)** UDINE, Forra di Fleons, 1400 m, on deer (***Cervus elaphus***) dung in culture, F. Bersan e F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 03195 octo. **9)** TRENTO, Baselga di Piné, 1300 m, on hare (***Lepus sp.***) dung, A. Bizzi, 5.9.98., 060.1.-Cembra, CLSM 03195 ena. **10)** VICENZA, Nogarole Vicentino (Monte Faldo), 600 m, on horse dung in culture, A. Bizzi, 1.9.99., 124.1-Arzignano, CLSM 03195 deca.

42) Iodophanus carneus (Pers.: Fr.) Korf *apud* Kimbr. & Korf, *Amer. J. Bot.*54 (1): 19, 1967.

≡ *Ascobolus carneus* Pers., *Syn. Meth. Fung.*: 676, 1801.
≡ *Ascobolus carneus* Pers.: Fr., *Syst. Mycol.* II: 165, 1823.
= *Ascobolus saccharinus* Berk. & Curr. *apud* Berk., *Outl. Brit. Fung.*: 374, 1860 (*nom. nudum*).
= *Ascobolus saccharinus* Berk. & Curr. ex Cooke, *J. Bot., Lond.* 2: 154, 1864.
= *Peziza (Humaria) salmonicolor* Berk. & Broome, *Ann. Mag. Nat. Hist.* III 18: 124, 1866.
= *Ascophanus saccharinus* (Berk. & Curr. ex Cooke) Boud., *Ann. Sci. Nat. (Bot.)* V 19: 251, 1869.
≡ *Peziza carnea* (Pers.: Fr.) P. Karst., *Not. Soc. Faun. Fl. Fenn.* 10: 120, 1869.
≡ *Ascophanus carneus* (Pers.: Fr.) Boud., *Ann. Sci. Nat. (Bot.)* V 10: 250, 1869.
= *Ascobolus thwaitesii* Berk. & Broome, *J. Linn. Soc. (Bot.)* 14: 109, 1873.
= *Peziza humosoides* Peck, *Ann. Rep. N. Y. State Mus.* 32: 46, 1879.
= *Ascophanus humosoides* (Peck) Peck, *Bull. N. Y. State Mus.* 2: 22, 1887.
= *Ascophanus carneus* var. *saccharinus* (Berk. & Curr. ex Cooke) Phill., *Man. Br. Discom.*: 310, 1887.
= *Humaria salmonicolor* (Berk. & Broome) Sacc., *Syll. Fung.* 8: 123, 1889.
≡ *Pyronema carneum* (Pers.: Fr.) J. Schröt., *Cohn's Krypt.-Fl. Schles.* 3 (2): 34, 1893.
= *Ascophanus salmonicolor* (Berk. & Broome) Boud., *Hist. Class. Discom. Eur.*: 76, 1907.

MATERIAL: **ITALY: 1)** PISA, manège of Calambrone, 0 m, hundreds of gregarious specimens on horse (***Equus caballus***) manure, F. Doveri & G. Cacialli, 3.4.93., 272.2-Marina di Pisa, A.M.B.-Livorno 00693. **2)** TRENTO, Malga di Fondo, 1400 m, dozens of gregarious specimens on bovine (***Bos taurus***) excrements, F. Doveri, 17.9.94., 026.3-Fondo, A. M. B.-Livorno 00693 bis. **3)** BOLZANO, Paludi di Trinkstein, 1600 m, dozens of crowded specimens on bovine excrements in culture, F. Doveri & V. Caroti, 3.9.96., 003.3- Valle Aurina, A.M.B.-Livorno 00693 ter. **4)** TRENTO, Malga Montagna Grande, 1700 m, on cow dung, F. Doveri and G. Medardi, 26.9.97., 060.120.-Frassilongo, CLSM 00693 quater. **5)** BELLUNO, Forcella Negher, 2300 m, on marmot (***Marmota marmota***) dung in culture, E. Bizio, 2.9.97., 045.1.-Cencenighe Agordino, CLSM 00693 penta. **6)** TREVISO, Scalon, 200 m, on sheep (***Ovis aries***) dung in culture, E. Bizio, 6.6.97., 083.1.-Valdobbiadene, CLSM 00693 esa. **7)** UDINE, Forra di Fleons, 1400 m, on cow dung in culture, F. Bersan e F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 00693 epta. **8)** COSENZA, San Demetrio Corone (Contrada Calamaia), 800 m, on goat (***Capra hircus*** ?) dung in culture, C. Lavorato, 16.5.98., 552.3.-San Demetrio Corone, CLSM 00693 octo. **9)** COSENZA, Orsomarso, 1300 m, on cow dung in culture, C. Lavorato, 17.5.98., 533.2.-Mormanno, CLSM 00693 ena. **10)** UDINE, Forra di Fleons, 1400 m, on deer (***Cervus elaphus***) dung in culture, F. Bersan e F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 00693 deca. **11)** LIVORNO, 0 m, on snail (***Helix sp.***) dung in culture, F. Doveri, 20.9.98., 283.1.-Livorno, CLSM 00693 undeca. **12)** COSENZA, S. Demetrio Corone, 700 m, on tortoise (***Testudo sp.***) dung in culture, C. Lavorato, 1.9.98., 552.4.-S. Demetrio Corone, CLSM 00693-XII. **13)** COSENZA, S. Demetrio Corone, 800 m, on ant (***Formica sp.***) dung in culture, C. Lavorato, 18.12.98., 552.4.-S. Demetrio Corone, CLSM 00693-XIII. **14)** ROVIGO, Isola di Albarella, 0 m, on deer dung in culture, G. Robich, 14.6.99., 170.3.-Porto Levante, CLSM 00693-XIV. **15)** BRESCIA, Passo del Tonale, 2200 m, on cow dung, P. Cugildi, 8.9.99., 0412-Ponte di Legno, CLSM 00693-XV. **16)** TRENTO, Malga Giumella (Valle di Pejo), 1700 m, M. Zugna, 8.9.99., 0411-Corno dei Tre Signori, CLSM 00693-XVI. **17)** BRESCIA, Passo del Tonale, 2200 m, on deer dung, G. Robich, 8.9.99., 0412-Ponte di Legno, CLSM 00693-XVII. **18)** VICENZA, Sarego, 250 m, on horse dung in culture, A. Bizzi, 20.8.99., 025.3-Longare, CLSM 00693-XVIII. **19)** VICENZA, Recoaro (Monte Rasta), 1000 m, on roe deer (***Capreolus capreolus***) dung in culture, A. Bizzi, 9.9.99., 102.2- Valdagno, CLSM 00693-XIX.

43) Thecotheus pelletieri (Crouan & Crouan) Boud., *Ann.. Sci. Nat. (Bot.)* 5 (10): 236, 1869.

Pl. 2-e

≡ *Ascobolus pelletieri* Crouan & Crouan, *Ann.. Sci. Nat. (Bot.)* 4 (7): 173, 1857.
≡ *Pezizula pelletieri* (Crouan & Crouan) Speg., *Michelia* 1 (2): 238, (1878).
≡ *Ryparobius pelletieri* (Crouan & Crouan) Sacc. in Vido, *Michelia* 1 (5): 605, 1879.
≡ *Mollisia pelletieri* (Crouan & Crouan) Gillet, *Champ. France. Discom.* 1: 135, 1879.
≡ *Ascophanus pelletieri* (Crouan & Crouan) Quél., *Enchiridion fungorum*: 295, 1886.

MATERIAL: **ITALY: 1)** BRESCIA: Esenta, 200 m, about twenty gregarious specimens on dung of unidentified sheep, G. Medardi, 10.96., 122.3-Montichiari, MCVE 549. **2)** BERGAMO, Dossena, 1000 m, on cow (***Bos taurus***) dung, A. De Vito, 21.8.97., 077.3.-San Pellegrino Terme, CLSM 04896 bis. **3)** PORDENONE, Barcis, 700 m, on deer (***Cervus elaphus***) dung in culture, G. Zecchin, 19.6.98., 064.1.-Montereale Valcellina, CLSM 04896 ter. **4)** UDINE, Sauris di Sopra, 1400 m, on horse (***Equus caballus***) dung in culture, G. Medardi, 25.6.98, 030.2.-Forni di Sopra, CLSM 04896 quater. **5)** VICENZA, Sarego, 250 m, on horse dung in culture, A. Bizzi, 20.8.99., 025.3-Longare, CLSM 04896 penta.

44) Thecotheus crustaceus (Starbäck) Aas & Lundq., *Univ. Bergen Bot. Inst. Thesis* 4: 70, 1992.

≡ *Ascophanus crustaceus* Starbäck, *Bot. Not.*: 216, 1898.
≡ *Iodophanus crustaceus* (Starbäck) Kimbr., *Amer. J. Bot.* 56 (10): 1200, 1969.
= *Thecotheus agranulosus* Kimbr., *Mycologia* 61: 112, 1969.

MATERIAL: **ITALY:** GORIZIA, Cona island, 0 m, about thirty gregarious, often crowded, superficial specimens on horse (***Equus caballus***) dung in culture, F. Bersan, 8.97., 109.131-Monfalcone, CLSM 02797.

45) Thecotheus cinereus (Crouan & Crouan) Chenant., *Bull. Soc. Mycol. Fr.* 34: 39, 1918.

≡ *Ascobolus cinereus* Crouan & Crouan, *Ann. Sci. Nat. Bot.* IV, 10: 194, 1858.
≡ *Ascophanus cinereus* (Crouan & Crouan) Boud., *Ann. Sci. Nat. Bot.* V, 10: 249, 1869.
≡ *Mollisia cinerea* (Crouan & Crouan) Gillet, *Champ. Fr.: Discom.*: 134, 1879.
= *Thecotheus setisperma* Le Gal, *Bull. Soc. Mycol. Fr.* 78: 411, 1963.
≡ *Ascophanella cinerea* (Crouan & Crouan) Faurel & Schotter, *Cah. Maboké* 3 (2): 130, 1965.

MATERIAL: **ITALY: 1)** BRESCIA: Salò, 200 m, dozens of gregarious specimens on cow (***Bos taurus***) dung, G. Medardi e C. Gallinaro, 3.8.97., 100.2.-Salò, CLSM 05097. **2)** BRESCIA, Masaga, 1000 m, on excrements of an unidentified animal, G. Medardi & C. Gallinaro, 8.8.99., 100.1.-Valvestino, CLSM 05097 bis.

46) Thecotheus formosanus Y. Z. Wang, *Mycotaxon* 52 (1): 84, 1994. ***Fig. 20***

MATERIAL: **ITALY:** BRESCIA, Salò, 200 m, five isolated, superficial specimens on equine excrements,G. Medardi & C. Gallinaro, 2.1.98., 100.2.-Salò, CLSM 03598.

Apothecia up to 1 mm wide, sessile, subglobous or turbinate in the early stages, later on discoidal or lenticular, membraneous. Outer surface smooth, greyish with purple-brown shades. Margin even and well differentiated. Hymenium of the same colour, slightly concave, dotted due to the protruding asci (***fide*** G. Medardi).
Spores 17.8-21 (22) x 8.4-9.5 µm, most (about 75 %) inequilateral (amygdaliform), the others equilateral, ellipsoidal-subfusiform (Q = 2.11-2.50; Q = 2.25), uniseriate, surrounded by a large gelatinous sheath, in the early stages very granulous and thick-walled, hyaline but turning yellowish, not ornamented, strongly cyanophile, provided with two apiculi, 2-3.5 x 1-2.5 µm, clearly observable only with cotton blue, usually emispherical but sometimes even slightly elongated.
Asci 190-210 x 15-17 µm, strongly amyloid, slightly congophile, operculate, cylindrical, 8-spored, rounded or hardly flattened at the apex, rather long-stalked.
Paraphyses of two kinds: 1) most cylindrical-filiform, 1.5-2 µm wide, thin-walled, sometimes ramified at the base, containing a few uncoloured vacuoles, very crowded, straight, exceeding the asci, not or slightly enlarged at the apex, which isn't embedded in gelatinous material; 2) some ones thick-walled, up to 6 µm enlarged at the apex.
Subhymenium differentiated, made up of roundish, thick-walled hyphae, 5-8 µm wide.
Medullary excipulum about 200 µm thick in the middle part of the apothecium, of a ***textura intricata*****,** made up of cylindrical hyphae, 2-4 µm wide, not crowded, septate, ramified, rather thin-walled, running in all directions and building up a frame similar to a reticulum, often continuing up to the ectal ***excipulum*****,** outside which they end up by claviform enlargements, 7-10 µm wide.
Ectal excipulum thicker at the base, of a ***textura angularis***, made up of polygonal, thick-walled hyphae, 10-15 µm wide. But at the margin made up of roundish or claviform hyphae.

Observations. The species in subject is characterized by inequilateral spores, provided with strongly cyanophile apiculi.
We have attempted a comparison with the similar entities, that is to say with the species belonging to the genus ***Thecotheus*** Boud. whose spores possess the above mentioned features, but none of them turns out to be fully superimposable to our own.
For example, ***T. africanus*** Khan & Krug differs in the smaller (12-15 x 7,5-9 µm) spores and the presence of collarettes at the apiculus base (Krug & Khan, 1987). Besides it has been found almost exclusively on elephant dung. The spores, originally described as smooth, show according to Aas

(1992) a fine granulous ornamentation when observed under the light microscope at high magnification.
T. perplexans (Faurel & Schotter) Krug & Khan is another species with collarettes at the apiculus base, also distinguishable by the larger spores (20-22 x 10-12 µm). The typus material is pratically unobtainable, so that it's impossible to get information about the shape of the spores, paraphyses and ***excipulum***.
In ***T. inaequilateralis*** Aas the apothecia lie upon a well developed subiculum, the spores are smaller (13-16 x 7-8.5 µm), the medullary ***excipulum*** is not of a ***textura intricata***.
T. rivicola (Vacek) Kimbr. & Pfister isn't a fimicolous species, the medullary ***excipulum*** is made of a ***textura globulosa***, the spores are ornamentated with warts.
In ***T. biocellatus*** (Petrak) Aas the medullary excipulum is different in frame, besides the spores are dotted, slightly smaller and broadly ellipsoidal.
In the protologue of ***T. formosanus*** (Wang, 1994) the spores were described as dotted (warts less than 0,5 µm diam.), well, in opposition to the smooth spores of our collection, but Dr. Wang himself (***in littera***) informed us that the ornamentations are hardly visible with optic microscope, even if by a high magnifying lens. We have been lucky enough to study a slide coming from Formosa and belonging to the ***isotypus***, but we were not able to visualize the fine spore warts by the available equipment (optic microscopy x 1000).

47) Thecotheus lundqvistii Aas, *Thesis 4, Univ. Bergen Bot. Inst*.: 127, 1992.

MATERIAL: **ITALY**: BOLZANO, Val di Funes, 1500 m, about twenty specimens on old bovine (***Bos taurus***) excrements, G. Medardi, 6.89., 015.3-Funes, MCVE-ERB2 10743.

48) Thecotheus holmskjoldii (E. C. Hansen) Chenant., *Bull. Soc. Mycol. Fr.* 34: 39, 1918.

≡ *Ascophanus holmskjoldii* E. C. Hansen, *Vidensk. Meddel. Dansk Nathurist. Foren.1876:* 290, 1876.
= *Ascobolus incanus* Phill., *Grevillea* 5: 117, 1877.
≡ *Ascobolus holmskjoldii* (E. C. Hansen) Wint., *Hedwigia* 17: 91, 1878.
= *Ascophanus incanus* (Phill.) Sacc., *Syll. Fung.* 8: 529, 1889.
= *Thecotheus cinereus* (Crouan & Crouan) Chenant., ***ss.*** Chenant., *Bull. Soc. Mycol. Fr.* 34:39, 1918; ***ss.*** Le Gal, *Ann. Sci. Nat. (Bot.)* XII 1, 1960.
= *Thecotheus cinereus* var. *major* Chenant., *Bull. Soc. Mycol. Fr. 34: 39, 1918.*
= *Ascophanus holmskjoldii* var. *leporinus* Velen., *Monogr. Discom. Boh.*: 357, 1934.
= *Ascophanus holmskjoldii* var. *caprinus* Velen., *Monogr. Discom. Boh.*: 357, 1934.
≡ *Ascophanella holmskjoldii* (E. C. Hansen) Faurel & Schotter, *Cah. La Maboké* 3 (2): 130, 1965.

MATERIAL: **ITALY: 1)** LIVORNO, Botro delle Fontanelle, 200 m, six isolated specimens on bovine (***Bos taurus***) dung in culture, F. Doveri, 12.6.95., 284.4-Collesalvetti, MCVE 481. **2)** COSENZA, Rossano, 700 m, on cow dung in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 01495 bis. **3)** BRESCIA, Passo del Tonale, 2200 m, on deer (***Cervus elaphus***) dung, G. Robich, 8.9.99., 0412-Ponte di Legno, CLSM 01495 ter. **4)** VICENZA, Recoaro (Monte Rasta), 1000 m, on roe deer (***Capreolus capreolus***) dung, A. Bizzi, 9.9.99., 102.2- Valdagno, CLSM 01495 quater. **5)** BRESCIA, Masaga, 1000 m, on roe deer dung, G. Medardi & C. Gallinaro, 10.7.99., 100.1.-Valvestino, CLSM 01495 penta.

49) Ascodesmis nana Brumm., *Persoonia* 11 (3): 343, 1981. ***fig.21***

MATERIAL: **ITALY:** VENEZIA, bosco di Carpenedo, 0 m, about fifty gregarious, superficial specimens on dung (in culture) of an unspecified bird, G. Robich, 12.5.99., 127.2.-Mestre, CLSM 01599.

Ascomata (athecia) 80-170 µm diam., pulvinate or discoidal, whitish but turning greyish at maturity, membraneous, with a granulous hymenial surface due to the protrusion of the ripe asci. Margin not differentiated.
Spores unevenly seriate or conglobate inside the asci, (8.9) 9.4-10.5 (11) x 8.6-10 µm (ornamentations excluded), most subglobous but also globous and sometimes broadly ellipsoidal (Q= 1.00-1.21; Q= 1.08), rather thick-walled especially in the early stages, later on with thinner walls, provided with an easily observable perisporium, sometimes containing a large de Bary's bubble, at first hyaline, afterwards brown, with cyanophile ornamentations, which turn brown at maturity and consequently don't stain any more by cotton blue. Ornamentations in the shape of rounded warts and pointed or flattened (never enlarged at the apex) tubercules, up to 2 µm high and wide, isolated or linked to form short and simple or on the contrary longer and branched crestes.
Asci 46-58 x 18-25 µm, 8-spored, non-amyloid, congophile, broadly clavate, rather thick-walled, rounded at the apex, with a very short, truncate, hardly lobate stalk. Each ascoma usually contains more than 25 asci.
Paraphyses scarce, mixed with the asci and exceeding them, cylindrical, 3-4 µm diam., septate, straight or slightly curved, usually not enlarged at the apex, containing a few hyaline vacuoles.
Subhymenium pseudoparenchymatous (***textura angularis***), made up of 4-10 µm diam., thin-walled, uncoloured, polygonal hyphae.
Excipulum absent.

Observations. The species belonging to the genus ***Ascodesmis*** Tiegh. are prevalently fimicolous even if they can be found on other kinds of substratum (bare soil for example, according to van Brummelen, 1981). As regards ***A. nana***, our own is probably the first official finding both from Italy and bird droppings. This species is recognizable by the very small asci as well as by the small and (sub)globous spores. Also in ***Ascodesmis sphaerospora*** Obrist (1961) the spores are globous but in comparison with the subject ***taxon*** they are larger (11-15 x 10,5-14 µm) and ornamented with ridges, which merge and form an almost complete reticulum.

50) Ascodesmis nigricans Tiegh., *Bull. Soc. Bot. Fr.* 23: 275, 1877. ***Fig. 22***

= *Ascodesmis echinulata* Bainier, *Bull. Soc. Mycol. Fr.* :139, 1908.

MATERIAL: **ITALY: 1)** LIVORNO, Quercianella, 0 m, dozens of gregarious, superficial specimens on toad (***Bufo sp.***) dung in culture, C. Doveri, 1.10.97., 284.3.-Rosignano Marittimo, CLSM 03897. **2)** COSENZA, S. Demetrio Corone (Contrada Poggio), 600 m, on sparrow (***Passer italiae***) dung in culture, C. Lavorato, 1.12.98., 552.4.-S. Demetrio Corone, CLSM 03897 bis.

Athecia 90-180 µm wide, pulvinate or discoidal, light grey in the early stages, later on darker, granulous due to the protrusion of the ripe asci, membraneous.
Spores 10-12.5 x 8.4-9.5 µm (ornamentations excluded), confusedly arranged inside the ascus, broadly ellipsoidal (Q= 1.11-1.50; Q= 1.28), at first hyaline and thick-walled, then darker and darker brown, rounded at the ends, devoid of a gelatinous perisporium and guttulae, ornamented with cyanophile (but only when not yet pigmented) spines, up to 3 µm high, flattened and enlarged at the apex, usually isolated, but also merged to build up more or less long ridges.
Asci 42-48 x 22-25 µm, clavate-sacciform, non-amyloid, 8-spored, rather thick-walled, hardly congophile, rounded at the apex, truncate at the base, which rarely appears very short-stalked.
Paraphyses mixed and exceeding the asci, 3-5 µm wide, cylindrical, straight or slightly curved, simple or ramified at the base, septate, containing numerous vacuoles, not- or slightly enlarged at the apex.

Subhymenium made up of polygonal, 3-7 µm wide, hyaline, thick-walled hyphae.
Excipulum absent.

Observations. This cosmopolitan species has been isolated not only from excrements of many herbivores and carnivores but also from soil and vegetables (van Brummelen, 1981). Singular too our finding on toad dung.
Ascodesmis nigricans differs from ***A. microscopica*** (Crouan & Crouan) Seaver in the smaller spores, ornamented with spines which usually are isolated rather than often merged to build up an almost complete reticulum. A very detailed description of the species in subject was offered by Le Gal (1949). According to Obrist (1961) the specimens studied by the French scholar should be designated as ***neotypus***.

51) Ascodesmis microscopica (Crouan & Crouan) Seaver, *Mycologia* 8: 3, 1916 (misapplied) ***fig.23***

≡ *Ascobolus microscopicus* Crouan & Crouan, *Annls Sci. Nat. (Bot.)* IV 7: 175, 1857.
≡ *Boudiera microscopica* (Crouan & Crouan) Cooke, *Grevillea* 6: 76, 1877.
= *Boudiera claussenii* P. Henn., *Hedwigia* 42: 182, 1903.
= *Ascodesmis reticulata* Bainier, *Bull. Soc. Mycol. Fr.* 23: 137, 1908.

MATERIAL: **ITALY:** MODENA, Zocca, 750 m, dozens of gregarious, superficial specimens, on hedgehog (***Erinaceus europaeus***) dung in culture, L. Piccioli, 12.99., 237.4-Savigno, CLSM 02899.

Athecia 80-150 µm diam., sessile, pulvinate to discoidal, whitish with grey shades, smooth, with an undifferentiated margin. Hymenial surface dotted due to the protrusion of the ripe asci.
Spores (11.8) 12.3-13.3 x 9.5-10.4 µm (ornamentations excluded), biseriate to conglobate inside the asci, broadly ellipsoidal (Q= 1.22-1.35; Q= 1.25), rounded at the ends, thick-walled, hyaline in the early stages, later on quite dark brown, ornamented with up to 1 µm wide and 3 µm high ridges, which merge to build up an almost complete reticulum, whose points of junction support spinules with flattened apices. A few isolated spinules are also present inside the meshes of reticulum.
Asci 8-spored, non-amyloid, unitunicate, clavate-sacciform, 57-70 x 23-31 µm, with wavy walls and a very short, hardly differentiated stalk.
Paraphyses plentiful, mixed with the asci and exceeding them, cylindrical, septate (1 or 2 septa), simple or ramified at the base, 2-3.5 µm diam., enlarged at the apex up to 5 µm, containing pale yellowish vacuolar pigments.
Subhymenium made up of 4-7 µm diam., roundish or polygonal cells.
Excipulum absent, replaced by broad (7-10 µm diam.), congophile, septate, hyaline, thin-walled hyphae.

Observations. This cosmopolitan species develops on the excrements of several herbivores and omnivores. However we think that our finding is the first one from hedgehog dung.
As already pointed out by van Brummelen (1981, *l.c.*) this ***taxon*** was often misapplied in the past, for example by Seaver (1916) himself. The American scholar in fact validly recombined in ***Ascodesmis Ascobolus microscopicus*** established by Crouan & Crouan (1857), but mistaking it for ***Ascodesmis sphaerospora*** Obrist, a species with reticulate but also globous rather than broadly ellipsoidal spores.

52) Ascozonus woolhopensis (Renny in Berk. & Broome) Boud., *Hist. Class. Disc. Europe*: 79, 1907.

Fig. 24

≡ *Ryparobius woolhopensis* Renny in Berk. & Broome, *Ann. Nat. Hist.*IV (11): 348, 1873.
≡ *Ascobolus woolhopensis* (Renny in Berk. & Broome) Renny, *J. Bot.* 12: 356, 1874.
≡ *Streptotheca woolhopensis* (Renny in Berk. & Broome) Seaver, *North Amer. Cup-fungi (Opercul.)*: 143, 1928.

MATERIAL: **ITALY:** MANTOVA, Bosco Fontana, dozens of gregarious, superficial specimens on excrements of an unidentified herbivore, G. Medardi & C. Gallinaro, 3.1.99., 144.3-Marmirolo, CLSM 00399.

Ascomata gymnohymenial, turbinate or cup-shaped, 200-500 µm high and wide, provided with a hardly outlined stipe, granulous to the lens. Hymenial surface slightly concave, whitish, dotted because of the protruding asci. Margin even, fringy due to the presence of numerous hyaline hairs, which are hardly observable also by a lens. Outer surface light greyish or dirty white, covered with hyaline hairs except the lower part.
Spores conglobate inside the asci, (12) 12.6-14.7 x 4.7-5.7 µm, fusiform (Q= 2.08-3.10; Q= 2.43), usually asymmetrical, hyaline, some ones with fine, light yellow granulations, smooth, thick-walled, devoid of both de Bary's bubbles and oil drops.
Asci 100-110 x 25-35 µm, non-amyloid, unitunicate, 64-spored, claviform or cigar-shaped, with a very short, not lobate stalk, thick-walled, provided with a subapical thickened ring and a wedge-shaped apex, which appears slightly flattened or depressed in the middle, dehiscing by a bilabiate longitudinal slit, which runs from the apex to the subapical thickening.
Paraphyses sparse, mixed with the asci and exceeding them, cylindrical, septate, 2-3 µm diam., containing a few hyaline vacuoles, not embedded in a gelatinous material, slightly enlarged at the apex.
Subhymenium not differentiated from the medullary ***excipulum***.
Medullary excipulum of a ***textura angularis***, made up of hyaline, < 10 µm diam., polygonal hyphae.
Ectal xcipulum of a ***textura globulosa-angularis*** in the basal part of the ascoma, made up of thick-walled, hyaline, 17-35 x 15-30 µm, more or less roundish hyphae, of a ***textura angularis*** in the apical part, made up of 8-17 x 7-11 µm, polygonal hyphae, from which numerous hyaline hairs arise, 30-60 x 5-8 µm, 1-2-septate, thick-walled, enlarged at the base, rounded at the apex. Several rhizoids, 3-5 µm diam., septate, ramified, thick-walled, bulbous at the base, arise from the basal part of the ascoma.

Observations. Inside the family ***Thelebolaceae***, in which it has been recently arranged (Eriksson & Hawksworth, 1998; Brummelen, 1998), the genus ***Ascozonus*** (Renny) Boud. is easily recognizable on account of the eugymnohymenial ascomata (hymenium exposed since the early stages), fusiform spores, asci provided with a thickened subapical ring and dehiscing by a longitudinal split. In turn the species belonging to this genus are distinguishable from each other esapecially by the spore number inside the asci and the shape of the excipular hairs. Kimbrough & Korf (1967) judge valid the following ***taxa***: ***A. asteriscus*** (P. Karst.) Boud., ***A. citrinus*** [***sub nomine Streptotheca citrina*** (Crouan & Crouan) Le Gal], ***A. crouani*** (Renny) Boud., ***A. cunicularius*** (Boud.) Boud., ***A. leveillanus*** (Renny) Boud., ***A. niveus*** (Fuckel) Boud., ***A. parvisporus*** (Renny) Boud., ***A. subhirtus*** (Renny) Boud., ***A. woolhopensis*** (Renny) Boud.
In comparison with ***A. woolhopensis***, ***A. subhirtus*** and ***A. leveillanus*** show asci with a larger number of spores (respectively 128 and 96), while ***S. citrina***, ***A. parvisporus*** e ***A. crouani*** with a smaller one, respectively 8 (Le Gal, 1960), 16 and 32 (Renny, 1874). ***A. niveus*** and ***A. cunicularius*** posses, as ***A. woolhopensis,*** 64-spored asci, but in the former the spores are very smaller (6-7 x 3 µm, sec. Rehm, 1887), while in the latter the apothecia are almost discoidal and sessile rather than (sub)stipitate.

Recently (van Brummelen, 1998) ***Rhyparobius solms-laubachii*** (Rabenh) Rehm has been judged a true ***Ascozonus***, so that it has been recombined in this genus: the spores are more or less equal in size to ***A. woolhopensis***, but the asci are 32-spored.
All the ***Ascozonus*** are psychrophilic, so that they are found only in winter at the natural state (van Brummelen, 1974).

53) Chalazion erinaceum Doveri, Wang, Cacialli & Caroti, *RdM* 3:204, 1998.

MATERIAL: **ITALY:** GROSSETO: Punta Ala, 0 m, eleven gregarious, superficial specimens on hedgehog (***Erinaceus europaeus***) dung in culture, F. Doveri e F. Bersan, 2.4.98., 318.3.-Punta Ala, MCVE 706.

54) Coprotus aurora (Crouan & Crouan) Kimbrough, Luck-Allen & Cain, *Can. J. Bot.* 50: 957-971, 1972.

Fig.25

≡ *Peziza aurora* Crouan & Crouan, *Fl. Finist.* 53, 1867.
≡ *Ascophanus aurora* (Crouan & Crouan) Boud., *Ann. Sci. Nat.* V (10): 248, 1869.
≡ *Aleuria aurora* (Crouan & Crouan) Gillet, *Champ. Fr. Discom.* 54, 1879.
= *Ascophanus aurantiacus* Velen., *Monogr. Discom. Bohem.* 360, 1934.

MATERIAL: **ITALY:** COSENZA, Rossano, 700 m, two superficial specimens, on cow (***Bos taurus***) dung, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 00899.

Apothecia discoidal, 200-400 µm diam., bright orange, membraneous, smooth, with a non-differentiated margin. Hymenial surface dotted, more or less of the same colour as the outer surface.
Spores uniseriate, sometimes irregularly biseriate, one-celled, 12-12.6 x 7.3-7.8 µm, ellipsoidal (Q= 1.53-1.71; Q= 1.60), rounded at the ends, thick-walled in the early stages, hyaline, smooth, containing a large de Bary's bubble.
Asci non-amyloid, slightly congophile, unitunicate, 8-spored, cylindrical or more rarely cylindrical-claviform, 75-100 x 10-15 µm, rather short-stalked, slightly flattened at the apex.
Paraphyses cylindrical-filiform, 1.5-2 µm diam., not embedded in a gelatinous material, simple or ramified (rarely in their upper part), exceeding the asci, septate, containing many orange vacuoles, slightly uncinate, enlarged at the apex (up to 5 µm).
Subhimenium and **medullary excipulum** made up of small (< 5 µm diam.) polygonal or cylindrical, light, thin-walled hyphae.
Ectal excipulum of a ***textura globulosa-angularis*** in the lower part of the ascoma, made up of 7-17 µm diam., thick-walled, polygonal or subglobous hyphae, containing orange pigments. In the upper part the hyphae turn more crowded and parallel to the hymenium, while at the margin turn cylindrical-claviform.

Observations. The differences between ***Coprotus aurora*** and ***C. luteus*** Kimbr., Luck-Allen & Cain are very small, so that according to Kimbrough *et.al.* (1972) many collections which in the past were ascribed to the former really belong to the latter.
Hitherto we have observed in Italy a ***taxon***, which we have named "***affinis luteus***", characterized by yellowish apothecia and paraphyses, cylindrical asci, uniseriate spores, middle in size (10-12 x 6,5-7 µm) between ***C. aurora*** and ***C.luteus*** (Cacialli *et al.*, 1996 b). But now we are lucky enough to have observed on the same sample of bovine dung two specimens of ***C. aurora*** mixed with many

others belonging to ***C. aff. luteus***. The following differences emerge from their study, practically superimposable to the ones pointed out by Kimbrough *et al.* (*l.c.*): in ***C. aurora*** the apotecia are smaller and bright orange rather than yellowish, the paraphyses more enlarged at the apex and less uncinate, the asci not only cylindrical but also cylindrical-claviform, the spores larger and sometimes biseriate.
On the basis of such considerations we suppose that in the future, especially if helped by further findings, we'll be able to classify as ***C. luteus*** the collections hitherto labeled as "***aff. luteus***", obviously having to widen the variability range of the spore size (length up to 12 µm rather than 10 µm).

55) Coprotus aff. *luteus* Kimbr., Luck-Allen & Cain, *Can. J. Bot.* 50: 966, 1972.

MATERIAL: **ITALY: 1)** LIVORNO, Botro delle Fontanelle, 200 m, dozens of gregarious, superficial specimens on cattle (***Bos taurus***) dung in culture, F. Doveri, 10.6.95., 284.4.-Collesalvetti, MCVE 477. **2)** GORIZIA, Isola della Cona, 0 m, on horse (***Equus caballus***) dung in culture, K. Kravos, 3.11.97., 109.131.-Monfalcone, CLSM 01595 ter. **3)** COSENZA, Rossano, 700 m, on cow dung in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 01595 quater.

56) Coprotus subcylindrosporus J. Moravec, *Ceská Mykol.* 25 (3): 155, 1971. ***Fig. 26***

MATERIAL: **ITALY:** UDINE, Sauris di Sopra, 1400 m, four gregarious specimens on horse (***Equus caballus***) dung in culture, G. Medardi, 25.6.98., 030.2.-Forni di Sopra, CLSM 04698.

Apothecia 350-450 µm wide, 120-150 µm high, obconical, turning pulvinate or almost discoidal, light yellow, membraneous, smooth, with a not differentiated margin. Hymenial surface slightly convex or flat, granulous due to the protrusion of the ripe asci.
Spores (14.1) 14.7-17.3 x 8.4-8.9 µm, subcylindrical, rounded at the ends (Q= 1,70-2,06; Q= 1,87), often subphaseoliform, sometimes narrowly ellipsoidal, irregularly uniseriate but also biseriate, smooth, hyaline, devoid of oil drops and gelatinous perisporium but provided with a large de Bary's bubble, in the early stages thick-walled and containing a yellow granulous material.
Asci 84-100 x 15-19 µm, cylindrical or cylindrical-claviform, non-amyloid, congophile, 8-spored, operculate, slightly narrowed and flattened at the apex, with a short, lobate stalk.
Paraphyses cylindrical-filiform, 1,5-2,5 µm wide, septate, often ramified, containing plentiful vacuolar, yellowish pigment, exceeding the asci, straight or more often curved and slightly enlarged at the apex, not embedded in a gelatinous material.
Subhymenium and **medullary excipulum** scarcely differentiated.
Ectal excipulum pseudoparenchymatous, of a ***textura angularis*** or ***globulosa-angularis***, made up of light yellow, 8-15 x 7-11 µm, polygonal or roundish hyphae, turning lengthened on the sides of the apothecium or claviform near the hymenium.

Observations. This species is very close to ***C. ochraceus*** (Crouan & Crouan) J. Moravec, in comparison with which it shows tendentially smaller apothecia, shorter asci as well as subcylindrical rather than broadly ellipsoidal (***fide*** Le Gal, 1960) spores.
The specimens of our finding slightly differ from the ***typus*** as they are provided with shorter asci, paraphyses containing plentiful yellowish pigment and often subphaseoliform spores (this latter characteristic unmentioned in the protologue). The absence of such pigments in the collection

described by Moravec (1971) amazes us, as all the other yellowish ***Coprotus*** possess lipidic inclusions of the same colour. The dichotomous key of the genus ***Coprotus*** suggested by Kimbrough *et al.* (1972) and afterwards accepted by other scholars was inspired by this characteristic itself.

57) Coprotus aff. ochraceus (Crouan & Crouan) J. Moravec, *Ceská Mykol.* 25: 155, 1971. ***Fig. 27***

MATERIAL: **ITALY:** BRESCIA, Lavenone, 400 m, many gregarious specimens, in small groups, on excrements of unidentified herbivore, G. Medardi, 100.4.-Vestone, CLSM 02196.

Apothecia up to 800 µm wide, sessile, in the early stages globous, later on discoidal. Hymenial surface yellowish, granulous owing to the protruding ripe asci. Margin not differentiated. Outer surface smooth, of the same colour or slightly darker.
Spores (15.7) 16.2-19 x 10.5-12 µm (Q= 1.42-1.75; Q= 1.58), irregularly biseriate, ellipsoidal, rounded at the ends, smooth, hyaline, thick-walled, containing a large de Bary's bubble.
Asci 100-117 x 22-31.5 µm, operculate, non-amyloid, 8-spored, evenly congophile, cylindrical-clavate or claviform, rounded at the apex, with a short lobate stalk.
Paraphyses unbranched or branched at the base, septate, cylindrical-filiform, 2-2.5 µm wide, containing many yellowish pigments (more concentrated at the apex), exceeding the asci, straight or slightly curved at the apex, which is hardly or even markedly enlarged (up to 6 µm).
Subhymenium almost undetectable, made up of very small, more or less isodiametrical hyphae.
Excipulum not well differentiated: medullary one made up of polygonal, up to 15 µm wide hyphae; ectal one of a ***textura globulosa-angularis***, with yellowish, 18-37 x 15-25 µm hyphae, turning wider towards the apothecium sides.

Observations. ***C. ochraceus*** is very close to ***C. leucopocillum*** Kimbr., Luck-Allen & Cain on account of the large and broadly ellipsoidal spores, but it differs in the larger apothecia and pigmented paraphyses and ***excipulum***'s hyphae, which produce the yellowish staining of the ascomata.
We conferred the epithet "***affinis ochraceus***" to the entity which we have studied as we have ascertained that a great many characteristics are superimposable to the ***typus***, as described by Kimbrough *et al.* (1972) and Barrasa (1985), but the asci are cylindrical-clavate or even claviform rather than cylindrical and consequently the spores are biseriate rather than arranged in one row. Personally (Cacialli *et al.*, 1996) we observed that in ***C. leucopocillum*** the ascus shape and the spore arrangement are close to the entity in subject, which however differs in the deep staining and usually in the larger ***excipulum***'s hyphae (typical features in ***C. ochraceus***).
Finally let us mention that after Aas (1983) the right nomenclatural definition is ***Coprotus ochraceus*** (Crouan & Crouan) J. Moravec and not ***Coprotus ochraceus*** (Crouan & Crouan) Larsen, as reported by many scholars. In fact the new combination of the preexistent ***Ascobolus ochraceus*** Crouan & Crouan made by Moravec preceded Larsen by about one month.

58) Coprotus sexdecimsporus (Crouan & Crouan) Kimbr., *Am. J. Bot.* 54: 22, 1967.

≡ *Ascobolus sexdecimsporus* Crouan & Crouan, *Ann. Sci. Nat.* 4, 10: 195, 1858.
≡ *Ascophanus sexdecimsporus* (Crouan & Crouan) Boud., *Ann. Sci. Nat.* 5, 1o: 247, 1869.
≡ *Rhyparobius sexdecimsporus* (Crouan & Crouan) Sacc., *Syll. Fung.* 8: 541, 1889.

MATERIAL: **ITALY: 1)** LIVORNO, Botro delle Fontanelle, 200 m, dozens of gregarious, superficial specimens on cattle (***Bos taurus***) dung in culture, F. Doveri, 5.5.95., 284.4.-Collesalvetti, MCVE 478. **2)** TRENTO, Malga Montagna Grande, 1700 m, on horse (***Equus caballus***) dung in culture, F. Doveri, 26.9.97., 060.120.-Frassilongo, CLSM 00695 bis. **3)** GROSSETO, Principina terra, 0 m, on horse dung in culture, F. Doveri, 331.3.-Albere, CLSM 00695 ter. **4)** UDINE, Sauris di sopra, 1400 m, on horse dung in culture, G. Medardi, 030.2.-Forni di sopra, 00695 quater. **5)** COSENZA, Orsomarso, 1300 m, on horse dung in culture, C. Lavorato, 17.5.98., 533.2.-Mormanno, CLSM 00695 penta. **6)** COSENZA, Rossano, 700 m, on wild pig (***Sus scrofa***) in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 00695 esa. **7)** VICENZA, Sarego (Monte Roccolo), 250 m, on horse dung in culture, A. Bizzi, 20.8.99., 125.3.-Longare, CLSM 00695 epta.

59) Coprotus glaucellus (Rehm) Kimbr., *Am. J. Bot.* 54: 22, 1967. ***Fig. 28***

≡ *Ascophanus glaucellus* Rehm, *Rab. Krypt. Fl.* 1(3): 1086, 1895.

MATERIAL: **ITALY: 1)** BRESCIA, Val Vestino, 1000 m, hundreds of gregarious, superficial specimens on roe deer (***Capreolus capreolus***) dung, G. Medardi, 23.9.96., 100.1.-Vestone, MCVE 568. **2)** TRENTO, Malga Montagna Grande, 1700 m, on roe deer dung in culture, F. Bersan, 26.9.97., 060.120.-Frassilongo, CLSM 05096 bis. **3)** CUNEO, Valle Pesio, 1000 m, on roe deer dung, V. Somà, 27.7.97., 210.3.-Morozzo, CLSM 05096 ter. **4)** PORDENONE, Frisanco, 500 m, on deer dung in culture, G. Zecchin, 18.6.98., 065.4.-Maniago, 05096 quater. **5)** FERRARA, Mesola, 0 m, on deer (***Cervus elaphus***) dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 05096 penta.

Apothecia subglobous to pulvinate or discoidal, 200-1000 µm wide, with a not differentiated margin. Hymenial surface translucid white, granulous owing to the protruding ripe asci. Outer surface smooth, more or less of the same colour.
Spores 8.4-9.6 (10) x 5.2-5.8 µm (Q= 1.54-1.80; Q= 1.70), uni- or irregularly biseriate (in the latter case constantly arranged in one row in the lower part of the ascus), ellipsoidal, sometimes bean-shaped, rounded at the ends, thick-walled only in the early stages, smooth, hyaline, almost always with a large gaseous de Bary's bubble, surrounded by a light halo (gelatinous material ?)
Asci cylindrical or cylindrical-claviform, 52-73 x 10-14 µm, operculate, non-amyloid, congophile, 8-spored, dome-shaped at the apex and short-stalked.
Paraphyses cylindrical-filiform, 1.5-2 µm wide, exceeding the asci, septate, unbranched or more often even ramified at the apex, with many light yellow-greenish vacuoles, sometimes not enlarged at the apex but often swollen (up to 4 µm wide) and usually decidedly uncinate.
Subhymenium undefined.
Excipulum not well differentiated in medullary and ectal one, of a ***textura angularis***, made up of polygonal, 7-14 x 5-10 µm, light yellow, thick-walled, strongly cyanophile hyphae. On the side the hyphae turn to lengthen becoming subcylindrical, but the ones close to the hymenial surface are usually smaller and more rounded.

Observations. Inside the genus ***Coprotus*** Korf ex Korf & Kimbr. (1967) the diagnosis at the species rank is chiefly based on the ascus and spore shape and size as well as on the shape and contents of the paraphyses.
Kimbrough ***et al.*** (1972) divided by a dichotomous key the entities 1) *"with yellow to orange apothecia, paraphyses provided with orange granules or guttules, weakly cyanophilous excipulum"* from those *" with translucent to white apothecia, paraphyses without pigmented guttules, sometimes strongly cyanophilous and dextrinoid excipulum"*
In our opinion it's quite difficult to distinguish a kind of pigment from another by the optical microscope, so that we think that the aforementioned key is misinterpretable, at least partly. The detailed description of the single ***taxa*** doesn't remove but on the contrary it stresses the problem, as the american scholars (*l. c.)* constantly report the presence of yellow pigments inside the

paraphyses of the species belonging to the former group but also a soft pigmentation in a few ***taxa*** belonging to the latter [see, for istance, ***C. granuliformis*** (Crouan & Crouan) Kimbr.].
Also in ***C. baeosporus*** Jeng & Krug, 1977 (a species with pale apothecia and dextrinoid ***excipulum,*** therefore with characteristics peculiar to the latter group of Kimbrough ***et al.***), the paraphyses contain *"many small light yellowish guttae"*. Personally we have observed many greenish-yellow pigments in ***C. glaucellus***, which therefore we could have easily mistaken for ***C. luteus*** Kimbr. Luck-Allen & Cain, a ***taxon*** with such pigments and a similar spore size. But this latter is provided with yellow apothecia and not so uncinate and ramified paraphyses.
C. glaucellus is also similar to ***C. lacteus*** (Cooke & W. Phillips) Kimbr., Luck-Allen & Cain, which however differs in the larger asci and less uncinate paraphyses.

60) Coprotus leucopocillum Kimbr., Luck-Allen & Cain, *Can. J. Bot.* 50: 965, 1972.

MATERIAL: **ITALY:** PISA, Calambrone, 0 m, dozens of gregarious specimens on horse (***Equus caballus***) dung in culture, F. Doveri, 1.96., 272.2.-Marina di Pisa, MCVE 550.

61) Coprotus granuliformis (Crouan & Crouan) Kimbr., *Am. J. Bot.* 54 (1): 22, 1967. ***Pl. 2-d***

≡ *Ascobolus granuliformis* Crouan & Crouan, *Ann. Sci. Nat.* 4, 10: 195, 1858.
= *Ascobolus argenteus* Currey, *Trans. Linn. Soc.* 24: 496, 1864.
≡ *Ascophanus granuliformis* (Crouan & Crouan) Boud., *Ann. Sci. Nat.* 5, 10: 245, 1869.
= *Ascophanus argenteus* (Currey) Boud., *Ann. Sci. Nat.* 5, 10: 245, 1869.
= *Ascophanus perpusillus* Speg., *Anal. Mus. Nac. Buen. Aires* 6: 309, 1898.
= *Ascophanus rosellus* Starbäck, *Bot. Notis.* 216, 1898.

MATERIAL: **ITALY: 1)** LIVORNO, Botro delle Fontanelle, 200 m, Thousands of crowded, superficial specimens on cattle (***Bos taurus***) dung, F. Doveri, 3.6.95., 284.4.-Collesalvetti, MCVE 479. **2)** TRENTO, Malga Montagna Grande, 1700 m, on cow dung in culture, F. Doveri, 26.9.97., 060.120.-Frassilongo, CLSM 00995 bis. **3)** BRESCIA, Salò, 200 m, on sheep (***Ovis aries***) dung, G. Medardi e C.Gallinaro, 16.6.97., 100.2.-Salò, CLSM 00995 ter. **4)** UDINE, Forra di Fleons, 1400 m, on cow dung in culture, F. Bersan e F. Doveri, 031.1.-Rigolato, CLSM 00995 quater.

62) Coprotus disculus Kimbr., Luck-Allen & Cain, Can. J. Bot. 50: 962, 1972. ***Fig. 29***

MATERIAL: **ITALY: 1)** TRENTO, Rifugio Marzola, 1800 m, dozens of gregarious, even crowded, superficial specimens on roe deer (**Capreolus capreolus**) dung in culture, M. Floriani, 26.9.97., 060.120.-Frassilongo, CLSM 04197. **2)** COSENZA, S. Demetrio Corone, 800 m, on goat (**Capra hircus**?) dung in culture, C. Lavorato, 4.98., 552.4.-S. Demetrio Corone, CLSM 04197 bis. **3)** COSENZA, Rossano, 700 m, on wild pig (***Sus scrofa***) dung in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 04197 ter. **4)** FERRARA, Mesola, 0 m, on deer (***Cervus elaphus***) dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 04197 quater.

Apothecia 330-500 µm wide, 200-250 µm high, pulvinate or discoidal, dirty whitish (more yellowish in the second collection), sessile, membraneous, with an undifferentiated margin and a rough hymenial surface due to the protruding ripe asci.

Spores uniseriate (sometimes biseriate in the second collection), 11.5-14 (14.7) x 6.3-8.5 (9) µm, ellipsoidal (Q= 1.41-2.00; Q= 1.72), rounded at the ends, in the early stages thick-walled, smooth, hyaline, containing a gaseous de Bary's bubble.
Asci 94-126 x 11-18 µm, non-amyloid, operculate, unitunicate, cylindrical, 8-spored, slightly flattened at the apex, with a short, lobate stalk.
Paraphyses 1.5-2 µm wide, cylindrical-filiform, not- or ramified at the base, septate, devoid of yellowish pigments, exceeding the asci, straight or curved but not uncinate at the apex, which sometimes is slightly enlarged (up to 3 µm).
Subhymenium made up of small, light, polygonal hyphae.
Excipulum not well differentiated in medullary and ectal one, of a ***textura globulosa-angularis***, made up of 5-17 µm wide hyphae, which turn to lengthen on the sides of the apothecium and to resemble the paraphyses at the margin.

Observations. No particular observation on this rather common species, sometimes mistaken for ***Coprotus lacteus*** (Cooke & Phillips) Kimbr., from which however it differs especially in the longer spores and asci (Kimbrough *et al.*, 1972; Thind *et al.*, 1978).
Also ***C. dextrinoideus*** Kimbr., Luck-Allen & Cain and ***C. glaucellus*** (Rehm) Kimbr. are quite close to ***C. disculus***. The former is distinguishable by the paraphyses less enlarged at the apex and the smaller spore Q. As regards the latter, it's absolutely the ***Coprotus*** with the smallest spores and asci. As pointed out by Thind *et al.* (*l.c.*) the collection described by Thind & Waraitch (1964) under the name ***Ascophanus lacteus*** (= ***Coprotus lacteus*****)** is really ***C. disculus***.

63)Thelebolus polysporus (P. Karst.) Otani & Kanzawa, *Trans. Mycol. Soc. Japan* 11: 45, 1970.

≡ *Ascobolus polysporus* P. Karst., *Fungi Fenn. exs.* N° 656, 1867.
≡ *Pezizula polyspora* (P. Karst.) P. Karst., *Bidr. Känn. Finl. Nat. Folk.* 19: 82, 1871.
≡ *Ryparobius polysporus* (P. Karst.) Speg., *An. Soc. cient. Argent.* 10: 24, 1880.
= *Ascozonus oligoascus* Heimerl, *Jber. k. k. Ober-Realsch. Bezirke Sechsh. Wien* 15: 27, (1889).

MATERIAL: **ITALY: 1)** BOLZANO: Paludi di Trinkstein, 1750 m, dozens of gregarious, partly immersed specimens, on horse **(*Equus caballus*)** dung, F. Doveri, 3.9.96., 003.3-Valle Aurina, MCVE 543. **2)** MESSINA, Parco dell'Etna, 1800 m, on sheep (***Ovis aries***) dung in culture, A. Bizzi, 9.11.98., 612.2.-Randazzo, CLSM 04796 bis. **3)** COSENZA, Rossano, 700 m, on wild pig (***Sus scrofa***) dung in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 04796 ter.

64) Thelebolus microsporus (Berk. & Broome) Kimbr. in Kobayasi et al., *Ann. Rept. Inst. Ferment. Osaka* 3: 50, 1967. ***fig.30***

≡ *Ascobolus microsporus* Berk. & Broome, *Ann. Mag. Nat. Hist.* 3 (15): 449, 1865. (non *A. microsporus* Velen.)
= *Ascobolus granuliformis* Coemans, *Bull. Soc. Bot. Roy. Belg.* 1: 88, 1862, ***ss.*** Massee, Rehm, Grelet, Phillips, Saccardo.
= *Peziza subfusca* Crouan & Crouan, *Fl. Finist.*: 53, 1867, ***ss.*** Brummelen, Dennis.
= *Ascobolus fallax* Auersw., *Hedwigia* 7: 52, 1868.
= *Ascophanus coemansii* Boud., *Ann. Sci. Nat. (Bot.)* V 10: 244, 1869, ***ss.*** Massee, Rehm, Grelet, Phillips, Saccardo.
? = *Ascophanus minutissimus* Boud., *Ann. Sci. Nat. Bot., Paris* V (10): 243, 1869.
= *Ascophanus subfuscus* (Crouan & Crouan) Boud., *Ann. Sci. Nat.* V, 10: 242, 1869, ***ss.*** Brummelen, Dennis.
= *Pezizula crustacea* var. *fallax* (Auersw.) P. Karst., *Myc. Fenn.* 1: 81, 1871.

= *Ascophanus fallax* (Auersw.) Sacc., *Syll. Fung.* 8: 532, 1889.
? = *Ascophanus brunnescens* P. Karst., *Medd. Soc. Fl. Fauna Fenn.* 16: 104, 1890, ***nobis.***
≡ *Ascophanus microsporus* (Berk. & Broome) Phillips, *Man. Brit. Discom.* : 307, 1893.
? = *Thelebolus coemansii* (Boud.) Brumm., *Persoonia* 16 (4): 433, 1998.

MATERIAL: **ITALY:** AOSTA, Passo Salati, 2970 m, about twenty gregarious, superficial specimens on steinbock (***Capra ibex ibex***) dung in culture, L. Levorato, 21.8.99., 071.3-Gressoney la Trinité, CLSM 03199.

Ascomata at first subglobous, when over ripe in the shape of sessile, 100-200 µm diam., discoidal or pulvinate, membraneous, smooth apothecia, with an undifferentiated margin. Outer surface bright yellow. Hymenial surface of the same colour, dotted due to the protrusion of the ripe asci.
Spores (7.6) 8.9 x 3.8-4.2 µm, narrowly ellipsoidal or ovoidal, sometimes slightly asymmetrical, (Q= 1.88-2.25; Q= 2.08), smooth, hyaline, rounded at the ends, without de Bary's bubbles, obliquely to almost horizontally uniseriate or irregularly biseriate inside the asci.
Asci numerous, cylindrical or cylindric-claviform, 62-80 x 11-15 µm, operculate, non-amyloid, 8-spored, rounded at their apex (slightly dome-shaped), short-stalked.
Paraphyses plentiful, mixed with the asci and exceeding them, cylindrical, 1.5-2 µm diam., simple or forked at their base, enlarged at the apex (up to 7 µm), septate, containing large quantities of bright yellow pigments (particularly crowded into the apical segments), sometimes straight, but usually slightly curved at the apex.
Subhymenium made up of small (2-5 µm diam.) pale, polygonal or roundish cells.
Excipulum not differentiated in medullary and ectal ones, of a ***textura globulosa*** or at intervals ***angularis***, made up of roundish or polygonal, 3-15 µm diam., yellowish, thick-walled cells, turning cylindrical on the apothecial flanks or claviform at the margin level.

Observations. According to most mycologists the morphological features of every species belonging to the genus ***Thelebolus*** are very changeable and particularly conditioned by phenotypical factors, as for example the environmental heat and brightness. So that a sudden change in the colour and size of the ascomata as well as in the number of asci in each fruit-body can take place. The only constant feature is the spore number in each ascus (Wicklow & Malloch, 1971; Brummelen, 1998).
This species is well recognizable on account of the 8-spored asci and very inflated apices of paraphyses, filled with bright yellow pigment.

65) Trichobolus zukalii (Heimerl) Kimbr., *Amer. J. Bot.* 54: 21, 1967. ***Fig. 31; Pl. 2-b***

≡ *Thelebolus zukalii* Heimerl, *Jahr. k. k. Ober-Realsch. Bezirke Sechshaus, Wien* 15:30, 1889.

MATERIAL: **ITALY: 1)** PISA, S. Rossore natural park, 0 m, dozens of scattered or gregarious specimens, at first fully immersed, later on erumpent, superficial or semi-immersed in the substratum, that is to say excrements of fallow deer (***Dama dama***) in culture, V. Caroti, 23.2.97., 271.1-Migliarino, MCVE 576. **2)** UDINE, Passo del Pura, 1400 m, on marten (***Martes martes***) dung in culture, F. Bersan, 11.9.97., 031.3.-Ampezzo, CLSM 00397 bis. **3)** TREVISO, Scalon, 230 m, on sheep (***Ovis aries***) dung in culture, E. Bizio, 6.6.97., 083.1.-Valdobbiadene, CLSM 00397 ter. **4)** BELLUNO, Forcella Negher, 2280 m, on marmot (***Marmota marmota***) dung in culture, E. Bizio, 2.9.97., 045.1.-Cencenighe Agordino, CLSM 00397 quater. **5)** COSENZA, San Demetrio Corone (Contrada Calamaia), 800 m, on goat (***Capra sp.***) dung in culture, C. Lavorato, 16.5.98., 552.3.-S. Demetrio Corone. **6)** UDINE, Forra di Fleons, 1400 m, on chamois (***Rupicapra rupicapra***) dung in culture, F. Bersan e F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 00397 esa. **7)** COSENZA, Corigliano Calabro (Contrada Tenimento), 300 m, on goat dung in culture, C. Lavorato, 16.5.98., 544.3.-Sibari, CLSM 00397 epta. **8)** MESSINA, Novara di Sicilia, on cervine dung in culture, G. Robich, 11.11.98., 613.4.-Francavilla di Sicilia, CLSM 00397 octo. **9)** COSENZA, Rossano, 700 m, on wild pig (***Sus scrofa***) dung in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 00397 ena. **10)** FERRARA, Mesola, 0 m, on deer (***Cervus***

elaphus) dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 00397 deca. **11)** BELLUNO, Canale d'Agordo (località Pisoliva), 1100 m, on roe deer (***Capreolus capreolus***) dung, E. Bizio, 14.6.98., 046.3.-Agordo, CLSM 00397-XI. **12)** BELLUNO, Forcella Venegia, 2250 m, on leporid dung in culture, E. Bizio, 045.4-Soraga, CLSM 00397-XII. **13)** AOSTA, Passo Salati, 2970 m, on steinbock (***Capra ibex ibex***) dung, L. Levorato, 21.8.99., 071.3-Gressoney la Trinité, CLSM 00397-XIII.

Ascomata cleistohymenial, pyriform, 300-450 µm high, 180-325 µm wide, hairy due to the presence of 10-15 hyaline, long setae, evenly arranged, usually running upward but sometimes also in other directions, observable even by a low magnifying lens; the upper one third of the ascomata is quite light yellow, while the lower two thirds are granulous and olive brown with reddish shades.
Spores conglobate and taking up the whole volume of the ascus, sometimes deformed owing to the reciprocal squeeze, (10.5) 11.5-12.6 x 9.4-10.2 (10.5) µm, usually broadly ellipsoidal, sometimes subglobous, unusually just globous (Q= 1.00-1.26; Q= 1.19), smooth, hyaline, rounded at the ends, thick-walled (about 1 µm), devoid of oil drops or de Bary's bubbles but containing a light yellowish, finely scurfy material. The number of spores inside the ascus is hardly calculable, but certainly higher than two- or three-thousand (6.000-7.000 according to Samuelson & Kimbrough, 1978).
Each receptacle is provided with only one pyriform or ovoidal **ascus**, 250-450 x 200-325 µm, non-amyloid, inoperculate, fully congophile, 3-4 µm wide at the base, thinner towards the apex, which irregularly tears at dehiscence.
Paraphyses not observed (only a small piece, enlarged at the apex, was seen).
Excipulum about 30 µm wide at the base, thinner and thinner towards the apex, fully covering the ascus (only an apical piece of the ripe ascus turns out uncovered): 1) **medullary excipulum** very thin, light yellow, of a ***textura prismatica***; 2) **ectal excipulum** of a ***textura angularis*** (made up of polygonal hyphae, up to 15 µm wide) layered at the two lower thirds, light yellow inside, but strongly stained, brownish outside, owing to a pigment which frequently coagulates, building up a kind of shell, and subsequently tears, making the ascomata granulous. From the outer hyphae, particularly at the base, numerous hyaline rhizoids arise, 3-7 µm wide, sometimes branched, septate, thick-walled, rounded at the apex.
Setae arising from the outside, 180-350 x 7-17 µm, straight, pointed, usually 2-7-septate, very light yellow-walled (2.5-4 µm thick), polymorphous but not bulbous at the base.

Observations. The receptacles of the genus ***Trichobolus*** (Sacc., 1892) Kimbr. & Cain (in Kimbrough & Korf, 1967) are very similar to ***Thelebolus*** Tode, but differ especially on account of their high, hyaline setae. Usually these latter are poly-septate and, on the basis of this characteristic, easily distinguishable from the undivided ***Lasiobolus***'s Sacc. (1884) setae. Only in ***Lasiobolus monascus*** Kimbr. (1974) and **L.** ***trichoboloides*** Kahn & Bezerra (in Bezerra & Kimbrough, 1975) setae with one or two basal septa and undivided other ones are observable at the same time. The former of these two ***taxa*** possesses, like ***T. zukalii***, receptacles provided with only one ascus, but it's distinguishable by the smaller spores and the bulbous setae (Kimbrough, *l. c.*; van Brummelen, 1984), while the latter is provided with many 8-spored asci and stands out for the cupulate apothecia and vertical arrangement of the ectal ***excipulum***'s hyphae (Bezerra & Kimbrough, *l. c.*).
T. zukalii usually grows on deer dung (Saccardo, 1892; Tóth, 1963 e 1965; Kimbrough 1966a-b; Ellis & Ellis, 1988), as also many other ***Trichobolus***, including ***T. octosporus*** Krug. The quite recent establishment of this entity, provided with many (25-40 in each receptacle) 8-spored asci, meant an emendation (Krug, 1973) of the genus to which it belongs (at first, in fact, ***Trichobolus*** included only species with few (1-3) poly-spored asci).
Many dichotomous keys (Kimbrough & Korf, *l. c.*; Krug, *l. c.*; Barrasa Gonzales, 1985) distinguish ***T. zukalii*** from ***T. sphaerosporus*** Kimbr. not only by the spore shape (subglobous to usually ellipsoidal in the former, globous or subglobous in the latter) but also by their contents (de Bary's

bubbles present in ***T. zukalii*** but not in ***T. sphaerosporus***). However let us specify that such gaseous bubbles can be highlighted only by certain aqueous stains and that in our collections of ***T. zukalii*** (except 00397 epta) they aren't present at all. But in our opinion the species which we have studied, although devoid of de Bary's bubbles, obviously differs from ***T. sphaerosporus***, al least from ***T. sphaerosporus*** described in the protologue (Kimbrough in Kimbrough & Korf, *l. c.*), in the indoubtedly larger spore Q (length\ width ratio) and asci as well as in the higher setae. So we have been astonished to notice that a few mycologists assigned the epithet ***T. sphaerosporus*** to a species which, according to drawings enclosed in the respective works, shows broadly ellipsoidal spores. In this connection we consider important some Richardson's (1972) statements, who, after having compared the length\width ratio of a few collections respectively classified as ***T. sphaerosporus*** and ***T. zukalii***, assumed that the resulting readings (expression of tendentially globous spores on the one hand, ellipsoidal ones on the other hand) could take their place at the opposite ends in the variability range of a single species.
We remind the interested reader that a good colour photograph of ***T. zukalii*** is observable on the seventh volume of "I funghi dal vero" (Cetto, 1993) and another one on Ayel's article (*l.c.*) concerning this species.

66) Trichobolus sphaerosporus Kimbr. in Kimbr. & Korf, *Amer. J. Bot.* 54 (1): 21, 1967.

fig.32

MATERIAL: **ITALY:** TRENTO, Cort Montagne, 1100 m, about ten scattered, semi-immersed specimens, on roe deer (***Capreolus capreolus***) dung, M. Castoldi & G. Robich, 3.5.99., 059.3.-Tione di Trento, CLSM 01499.

Ascomata cleistohymenial (hymenium exposed during a late stage), pyriform or ovoidal, 200-300 x 150-200 µm, dirty white to light yellow, hairy due to the presence of 5-10 upturned setae, which arise from the lower or middle part of the receptacles.
Spores conglobate inside the asci, (8.9) 9.2-9.9 x 8.4-8.9 (9.4) µm, globous or subglobous, rarely broadly ellipsoidal, (Q= 1.00-1.16; Q= 1.07), smooth, hyaline or very light yellow, finely granulous, thick-walled, devoid of both oil drops and de Bary's bubbles. The spore number inside each ascus is hardly calculable but undoubtedly higher than 1000.
Asci pyriform, 150-212 x 120-166 µm, non-amyloid, congophile, dehiscing by splitting, very thick-walled (about 3 µm), thinner upward. Each ascoma is provided with a single ascus.
Paraphyses plentiful, cylindrical-filiform, 2.5-3 µm diam., septate, wavy, often ramified, slightly enlarged at the apex, not pigmented.
Excipulum made up of an inner layer of ***textura prismatica*** and an outer one of ***textura angularis***, the latter with quite thin, 8-15 x 5-10 µm, polygonal hyphae.
Setae superficial, 125-350 x 4-10 µm, straight or slightly curved, with very light yellow walls (2-2.5 µm diam.), polyseptate (up to 12 septa), pointed (exceptionally rounded at the apex), with a 12-19 µm diam., polymorphous but not bulbous base.

Observations. The species which we have studied is superimposable to the one originally described by Kimbrough & Korf (1967), even if we are of the opinion (already expressed and fully matching Richardson, 1972) that ***Trichobolus sphaerosporus*** can be considered as an extreme form of ***T. zukalii*** (Heimerl) Kimbr., provided with more globous and tendentially smaller spores and usually shorter setae (Richardson & Watling, 1997).

67) Lasiobolus cuniculi Velen., *Monogr. Discom. Bohem.* 1: 363, 1934.

= *Lasiobolus brachytrichus* Velen., *Monogr. Discom. Bohem.* 1: 362-363, 1934.
= *Lasiobolus leporinus* Velen., *Monogr. Discom. Bohem.* 1: 413, 1934.

MATERIAL: **ITALY: 1)** REGGIO CALABRIA, Roccella Jonica, 0 m, dozens of superficial, gregarious specimens on wild rabbit (***Oryctogalus cuniculus***) dung, F. Bersan e F. Doveri, 30.10.95., 591.4-Roccella Jonica, CLSM 03796. **2)** PISA, Calambrone, 0 m, on horse (***Equus caballus***) dung in culture, F. Doveri, 18.2.97., 272.2.-Marina di Pisa, CLSM 03695 bis. **3)** PISA, S. Rossore, 0 m, on wild pig (***Sus scrofa sp***.) dung in culture, V. Caroti, 4.97., 272.1.-Migliarino, CLSM 03695 ter. **4)** ROVIGO, Porto Caleri, 0 m, on horse dung in culture, F. Doveri, 11.5.97., 169.2.-Contarina, CLSM 03695 quater. **5)** GORIZIA, Cona isle, 0 m, on horse dung in culture, F. Bersan, 1.8.97., 109.131.-Monfalcone, 03695 penta. **6)** COSENZA, Corigliano Calabro, 300 m, on goat (***Capra hircus*** ?) dung in culture, C. Lavorato, 16.5.98., 544.3.-Sibari, CLSM 03695 esa. **7)** MESSINA, Novara di Sicilia, on cervine dung, G. Robich, 9.11.98., 613.4.-Francavilla di Sicilia, CLSM 03695 epta. **8)** CATANIA, Parco dell'Etna, 1800 m, on sheep dung (***Ovis aries***), A. Bizzi, 9.11.98., 612.2.-Randazzo, CLSM 03695 octo. **9)** COSENZA, Rossano, 700 m, on wild pig dung in culture, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 03695 ena. **10)** COSENZA, Corigliano Calabro, 0 m, on sheep dung in culture, C. Lavorato, 22.12.98., 544.3.-Sibari, CLSM 03695 deca. **11)** FERRARA, Mesola, 0 m, on deer (***Cervus elaphus***) dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 03695-XI. **12)** ROVIGO, isola di Albarella, 0 m, on deer dung, G. Robich, 14.6.99., 170.3-Porto Levante, CLSM 03695-XII. **13)** BRESCIA, Passo del Tonale, 2200 m, on deer dung, G. Robich, 8.9.99., 0412-Ponte di Legno, CLSM 03695-XIII. **14)** VICENZA, Sarego (Monte Cocco), 230 m, on horse dung in culture, A. Bizzi, 20.8.99., 125.3.-Longare, CLSM 03695-XIV. **15)** AOSTA, Passo Salati, 2970 m, on steinbock (***Capra ibex ibex***) dung in culture, L. Levorato, 21.8.99., 071.3-Gressoney la Trinité, CLSM 03695-XV.

68) Lasiobolus intermedius Bezerra & Kimbr., *Can. J. Bot.* 53: 1218, 1975. ***Fig. 33***

MATERIAL: **ITALY:** COSENZA, Orsomarso (Parco Nazionale del Pollino), 1300 m, two specimens on donkey (***Equus asinus***) dung in culture, C. Lavorato, 17.5.98., 533.2.-Mormanno, CLSM 04498.

Apothecia 500-700 µm wide, 180-250 µm high, sessile, subconical or pulvinate when over-ripe, membraneous, yellowish. Margin scarcely differentiated. Outer surface covered with very light yellowish hairs, wich usually arise from the basal or medial part of the ascomata (never from the margin). Hymenial surface of the same colour, granulous due to the protrusion of the ripe asci.
Spores (14.1) 14.7-16.2 (16.8) x 8.9-9.9 µm, ellipsoidal (Q= 1.42-1.76; Q= 1.60), uniseriate, smooth, hyaline, containing yellowish granulous material, thick-walled (especially in the early stages), rounded at the ends. De Bary's bubbles not observed.
Asci 130-160 x 12-16 µm, cylindrical, operculate, 8-spored, non-amyloid, congophile, thick-walled, flattened or slightly pointed at the apex.
Paraphyses cylindrical-filiform, 1.5-2 µm wide, septate, containing a few light yellow vacuoles, exceeding the asci, sometimes ramified and usually enlarged at the apex.
Subhymenium not differentiated.
Medullary excipulum made up of small (5-7 µm wide), light, polygonal hyphae.
Ectal excipulum of a ***textura epidermoidea*** in the upper part of the apothecium, with hyphae running parallel to the hymenial surface, of a ***textura angularis*** (hyphae congophile, polygonal, 7-15 x 5-10 µm) at the base.
Hairs superficial, very light yellow, 288-630 x 16-40 µm, usually straight, pointed, subventricose at the base, devoid of septa, with 4-5 µm thick walls.
Rhizoids numerous, arranged at the base, septate, pigmented, sometimes ramified, 2.5-4 µm wide.

Observations. ***L. intermedius*** is quite close, as regards the main features, to ***L. ciliatus***, but it's distinguishable by the smaller and constantly uniseriate spores. Besides it differs from ***L. macrotrichus*** in the slightly smaller and ellipsoidal (Q= 1.60) rather than narrowly ellipsoidal or subfusiform (Q > 2.0) spores. We suppose it's a quite rare species, at least in Italy, as we have observed it only once during this long period devoted to the study of fimicolous fungi. In Europe it was described especially by the Spanish scholars (Guarro, 1983; Barrasa, 1985; Valldosera, 1991;)

but also by Aas (1978).

69) Lasiobolus ciliatus (J.C. Schmidt: Fr.) Boud., *Hist. Class. Discom. Eur.* 78, 1907.

≡ *Ascobolus ciliatus* Schmidt, *Mykol. Hefte* I: 90, 1817.
≡ *Ascobolus ciliatus* Schmidt: Fr., *Syst. Mycol.* II:164, 1822.
= *Peziza equina* O.F. Müll. ex S.F. Gray, *Nat. Arrang. Br. Pl.,*1: 666, 1821.
? = *Peziza papillata* Pers: Fr., *Syst. Mycol.* II: 88, 1822.
= *Ascobolus pilosus* Fr., *Syst. Mycol.* II: 164, 1822.
= *Peziza cervina* Pers., *Mycol. Eur.* 1: 254, 1822.
= *Peziza diversicolor* Fr., *Syst. Mycol.* II: 88, 1822.
= *Peziza stercorea* Pers.: Fr. var. *equina* Pers. (*ss.* Boud.,1869), *Mycol. Eur.* 1: 247, 1822.
? = *Ascobolus papillatus* (Pers.: Fr.) Wallr., *Fl. Crypt. Germ.* 2: 514, 1833.
≡ *Ascophanus ciliatus* (Schmidt: Fr.) Boud., *Ann. Sci. Nat.(Bot.)* 5, 10: 354, 1869.
? = *Ascophanus papillatus* (Pers.: Fr.) Boud., *Ann. Sci. Nat. (Bot.)* 5, 10: 252, 1869.
= *Ascophanus pilosus* (Fr.) Boud., *Ann. Sci. Nat. (Bot.)* 5, 10: 254, 1869.
= *Ascophanus pilosus* (Fr.) Boud. var. *equinus* (Pers.) Boud. *Ann. Sci. Nat. (Bot.)* 5, 10: 255, 1869.
= *Ascophanus pilosus* (Fr.) Boud. var. *vaccinus* Boud., *Ann. Sci. Nat. (Bot.)* 5, 10: 255, 1869.
= *Ascobolus equinus* (Müll. ex S.F. Gray) P. Karst., *Notis. Sällsk. Fauna Fl. fenn.* 11: 209, 1870.
= *Ascobolus equinus* (Müll. ex S.F. Gray) P. Karst. subsp. *Ascobolus pilosus* (Fr.) P.Karst., *Notis. Sällsk. Fauna Fl. fenn.* 11: 210, 1870.
≡ *Peziza equina* Müll. ex S.F. Gray var. *ciliata* (Schmidt: Fr.) P. Karst., *Mycol. fenn.* 1: 73, 1871.
= *Peziza equina* Müll. ex S.F. Gray var. *pilosa* (Fr.) P. Karst., *Mycol. fenn.* 1: 73, 1871.
= *Lachnea diversicolor* (Fr.) Gillet, *Champ. Fr., Discom.* 81: 1880.
= *Ascophanus pilosus* (Fr.) Boud. fo. *equinus* (Pers.) Rehm, *Ber. naturhist. Ver. Augsburg* 26: 28, 1881.
= *Ascophanus pilosus* (Fr.) Boud. fo. *vaccinus* (Boud.) Rehm, *Ber. naturhist. Ver. Augsburg* 26: 28, 1881.
? = *Lasiobolus papillatus* (Pers.: Fr.) Sacc., *Bot. Cbl.* 18: 220, 1884.
= *Lasiobolus pilosus* (Fr.) Sacc., *Bot. Cbl.* 18: 220, 1884.
= *Lasiobolus equinus* (Müll. ex S.F. Gray) P. Karst., *Acta Soc. Fauna Fl. fenn.* 2: 122, 1885.
≡ *Ascophanus pilosus* (Fr.) Boud. var. *ciliatus* (Schmidt: Fr.) Phill., *Man. Br. Ascom.* 312, 1887.
= *Scutellinia diversicolor* (Fr.) Lambotte, *Fl. mycol. Belg*., suppl. 1: 301, 1887.
= *Lasiobolus equinus* (Müll. ex S.F. Gray) P. Karst. subsp. *Lasiobolus ciliatus* (Schmidt: Fr.) Sacc., *Syll. Fung.* 8: 537, 1889 [*ut Lasiobolus ciliatus* (Berk.) Sacc.].
= *Lasiobolus pilosus* (Fr.) Sacc. var. *vaccinus* Gamundí, *Darwiniana* 13: 602, 1964.

MATERIAL: **1) ITALY:** BOLZANO, Val di Funes, 1300 m, hundreds of superficial, gregarious specimens on cattle (***Bos taurus***) dung, G. Medardi, 4.89., 015.3-Funes, MCVE-ERB2 10742**. 2)** VERCELLI, Zeroltu-Alagna, 1800 m, more than three hundred, very clustered specimens on old cattle dung, F. Doveri, 071.2-AlagnaValsesia, CLSM 03794. **3)** ROMA, Manziana, 300 m, thousands of specimens on horse (***Equus caballus***) dung, F. Doveri, 364-IV. Manziana, CLSM 03794 bis. **4)** GROSSETO, Principina terra, 0 m, on horse dung in culture, F. Doveri, 2.4.98., 331.3.-Albere, CLSM 03794 penta. **5)** COSENZA, Rossano, 700 m, on cow dung, C. Lavorato, 22.12.98., 552.1.-Corigliano Calabro, CLSM 03794 esa. **6)** BRESCIA, Passo del Tonale, 2200 m, on deer dung, G. Robich, 8.9.99., 0412-Ponte di Legno, CLSM 03794 epta. . **7)** BELLUNO, Forcella Negher, 2360 m, on steinbock (***Capra ibex ibex***) dung in culture, E. Bizio, 6.9.99., 045.1.-Cencenighe Agordino, CLSM 03794 octo. **8)** TRENTO, Malga Giumella (Valle di Pejo), 1700 m, on goat (***Capra hircus ?***) dung, M. Zugna, 8.9.99., 0411-Corno dei Tre Signori, CLSM 03794 ena.

70) Lasiobolus diversisporus (Fuckel) Sacc., *Syll. Fung.* 8: 538, 1889. ***Fig. 34***

≡ *Ascobolus diversisporus* Fuckel, *Jb. Nassau. Ver. Naturk.* 23-34: 289, 1870.
≡ *Humaria diversispora* (Fuckel) Speg., *Michelia* 1: 236, 1878.

MATERIAL: **ITALY:** UDINE, Monte Crostis, 2000 m, hundreds of gregarious, often crowded, superficial specimens, on cow (***Bos taurus***) dung, F. Bersan, 27.6.98., 031.1.-Fontana Panzit, CLSM 05198.

Apothecia 340-500 µm wide, 200-250 µm high, at first globous, later on cupulate, turning slightly to flatten when ripe, membraneous, bright orange, with the outer surface clothed with short, hyaline, rather dense hairs. Margin not well differentiated, not hairy. Hymenial surface of the same colour, dotted.
Spores usually biseriate, (25.2) 28.3-32.5 (36.2) x 12-14 µm, narrowly ellipsoidal to subcylindrical (Q= 1.84-2.87; Q= 2.31), rounded or slightly flattened (never pointed) at the ends, very thick-walled, smooth, hyaline or more often yellowish due to a granulous material of such a colour, provided with a large, gaseous de Bary's bubble.
Asci cylindrical to cylindrical-claviform, 157-180 x 24-30 µm, 8-spored, unitunicate, non-amyloid, slightly flattened at the apex, short-stalked.
Paraphyses 2-3 µm wide, cylindrical-filiform, septate, containing plentiful orange vacuolar pigment, simple or often furcate especially on their upper part, exceeding the asci, enlarged at the apex up to 5 µm.
Subhymenium not differentiated.
Medullary excipulum of a ***textura angularis***, made up of light, 4-7 µm wide, polygonal hyphae.
Ectal excipulum of a ***textura epidermoidea*** in the upper part of the apothecium (hyphae parallel to the hymenium), of a ***textura angularis*** in the lower one and in this case made up of pigmented, 8-30 x 8-20 µm, polygonal hyphae.
Hairs hyaline, stiff, straight or slightly wavy, not rooting, 200-375 x 18-30 µm, sometimes ventricose, not septate, with a truncate or attenuate base, with 2-4 µm thick walls, pointed or rarely rounded at the apex.
Rhizoids present at the base, septate, wavy, thick-walled.

Observations. Rehm (1895) and Seaver (1928) synonymyzed this species with ***L. ciliatus***, but Rifai (1968) had an opportunity to observe a specimen of the typus collection and to state that the spores are noticeably larger in ***L. diversisporus.*** Let us add that also the spore Q (length/width ratio) is larger in this latter.
L. ruber, which in our opinion is the closest species to ***L. diversisporus***, differs especially in the longer hairs and pointed spores.

71) Lasiobolus ruber (Quél.) Sacc., *Syll. Fung*. 8:537, 1889.

≡ *Ascophanus ruber* Quél., *Grevillea* 8: 117, 1880.
= *Lasiobolus capreoli* Velen., *Monogr. Discom. Bohem*., 1: 413, 1934.

MATERIAL: **ITALY: 1)** BOLZANO, Val di Funes, 1500 m, several gregarious, superficial specimens on roe deer (***Capreolus capreolus***) excrement, G. Medardi, 6.89., 015.3-Funes, MCVE 584. **2)** BRESCIA, Gaver, 1500 m, on cattle (***Bos taurus***) dung, G. Medardi, 6.89., 079.3-Bagolino, MCVE-ERB2 10750. **3)** BOLZANO, Val di Funes, 1500 m, on roe deer excrement, G. Medardi, 8.93., 015.3-Funes, CLSM 01896 ter. **4)** UDINE, Forra di Fleons, 1400 m, on chamois (***Rupicapra rupicapra***) dung in culture, F. Bersan e F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 01896 quater. **5)** UDINE, Val Bruna, 1700 m, on deer (***Cervus elaphus***) dung, A. Bizi, 28.6.98., 033.4.-Malborghetto Valbruna, CLSM 01896 penta. **6)** FERRARA, Mesola, 0 m, on deer dung, A. Bizzi & G. Zecchin, 17.4.99., 187.1.-Mesola, CLSM 01896 esa.

72) Lasiobolus macrotrichus Rea, *Trans. Br. Mycol. Soc.* 16: 440, 1917.

= *Lasiobolus longisetosus* Povah, *Pap. Mich. Acad. Sci. Arts Lett.* 9: 258, 1929.

MATERIAL: **ITALY: 1)** LIVORNO, Valle Benedetta, 100 m, about fifteen gregarious specimens on goat (***Capra***

aegagrus hircus) dung, G. Medardi, 26.4.96., 284.IV-Collesalvetti, MCVE 585. **2)** UDINE, Passo del Pura, 1400 m, on marten (***Martes martes***) dung in culture, F. Bersan, 11.9.97., 031.3.-Ampezzo, CLSM 02496 bis. **3)** TRENTO, Malga Montagna Grande, 1700 m, on roe deer (***Capreolus capreolus***) dung in culture, F. Bersan, 26.9.97., 060.120.-Frassilongo, CLSM 02496 ter. **4)** PORDENONE, Frisanco, 500 m, on deer dung in culture, G. Zecchin, 18.6.98., 065.4.-Maniago, CLSM 02496 quater.

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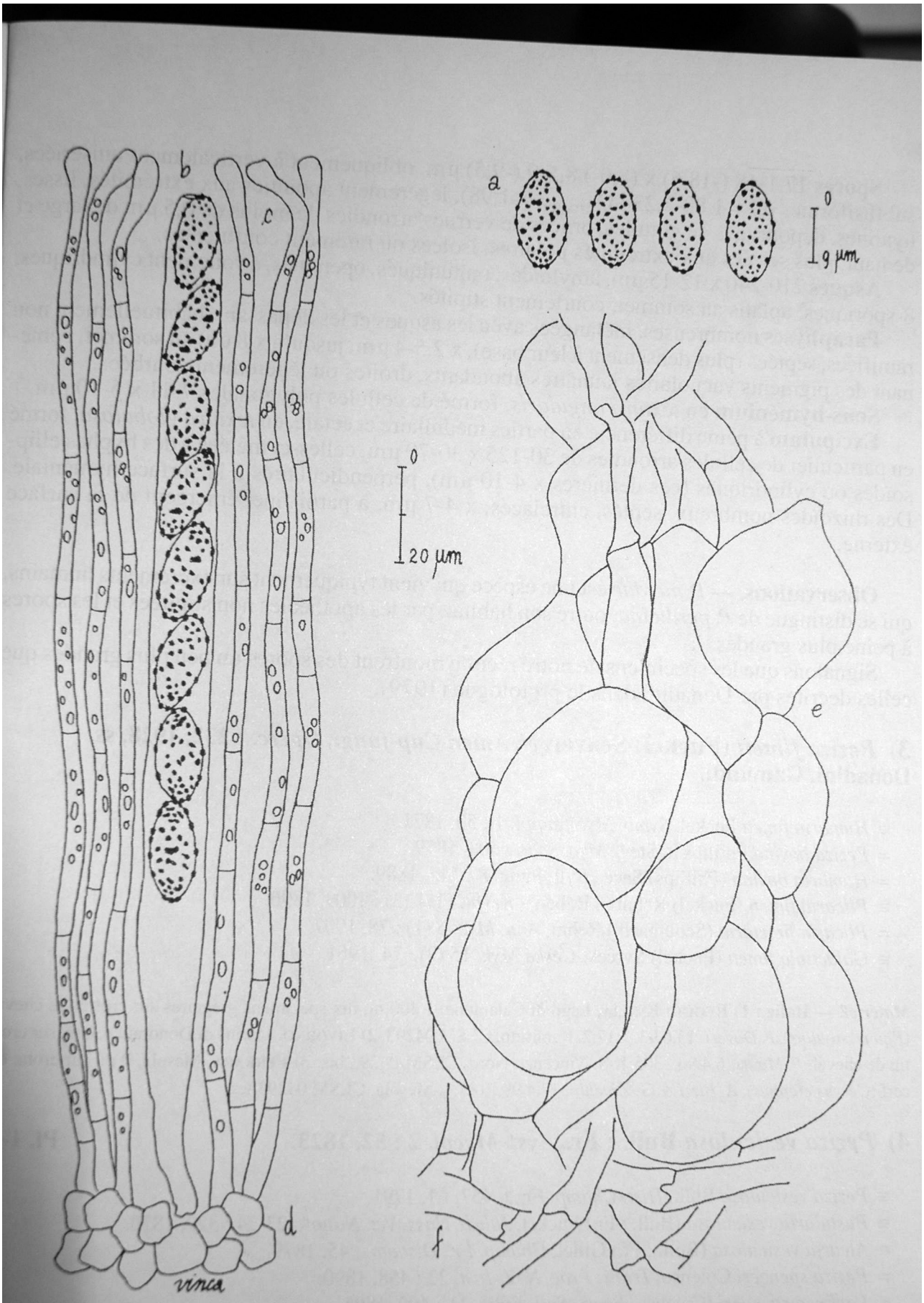
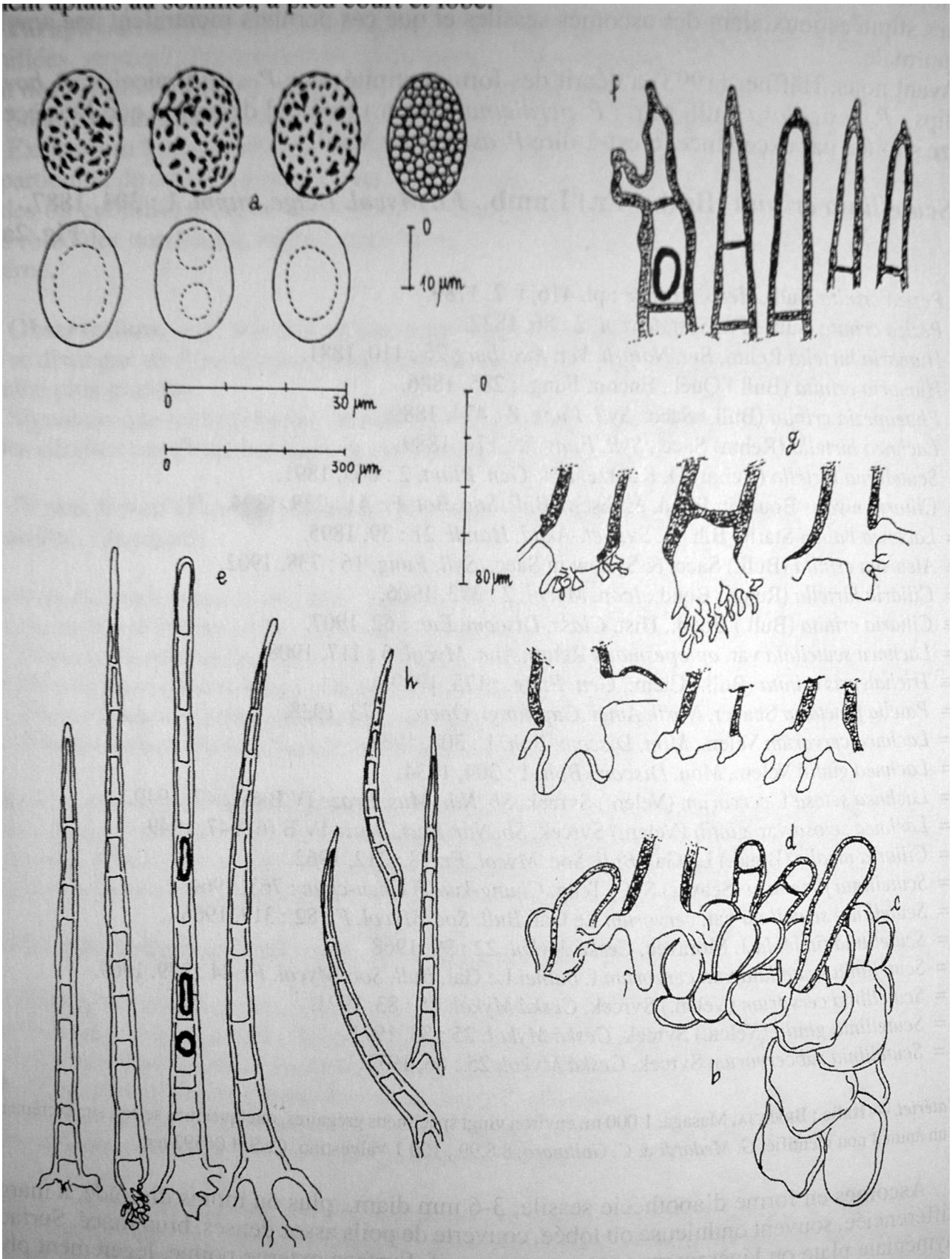


. 1. — *Peziza merdae* : a = spores ; b = asque avec spores mûres ; c = paraphyses ; d = sous-hymé-
m ; e = excipulum ; f = poils hyphoïdes.

Fig.1 (Peziza merdae) : a = spores ; b = ascus with ripe spores ; c = paraphyses ; d = subhymenium ; e = excipulum ; f = hyphoid hairs.



g. 2a. — *Scutellinia crinita* : a = spores ; b = excipulum ectal ; c = hyphes marginales ; d = poils
phoïdes ; e-g = poils marginaux ; h = poils latéraux.

Fig.2a (Scutellinia crinita): a = spores ; b = ectal excipulum ; c = marginal hyphae ; d = hyphoid hairs ; e-g = marginal hairs ; h = lateral hairs.

des pigments vacuolaires jaune verdâtre abondants, parfois à pigment pariétal, presque toujours diverticulées et à paroi épaisse au niveau du segment apical, lequel est élargi jusqu'à x 11 µm. Quelques paraphyses présentent le phénomène du *« fortoulisme »*.

Sous-hyménium entièrement développé, en *textura globulosa-angularis,* formé de cel-

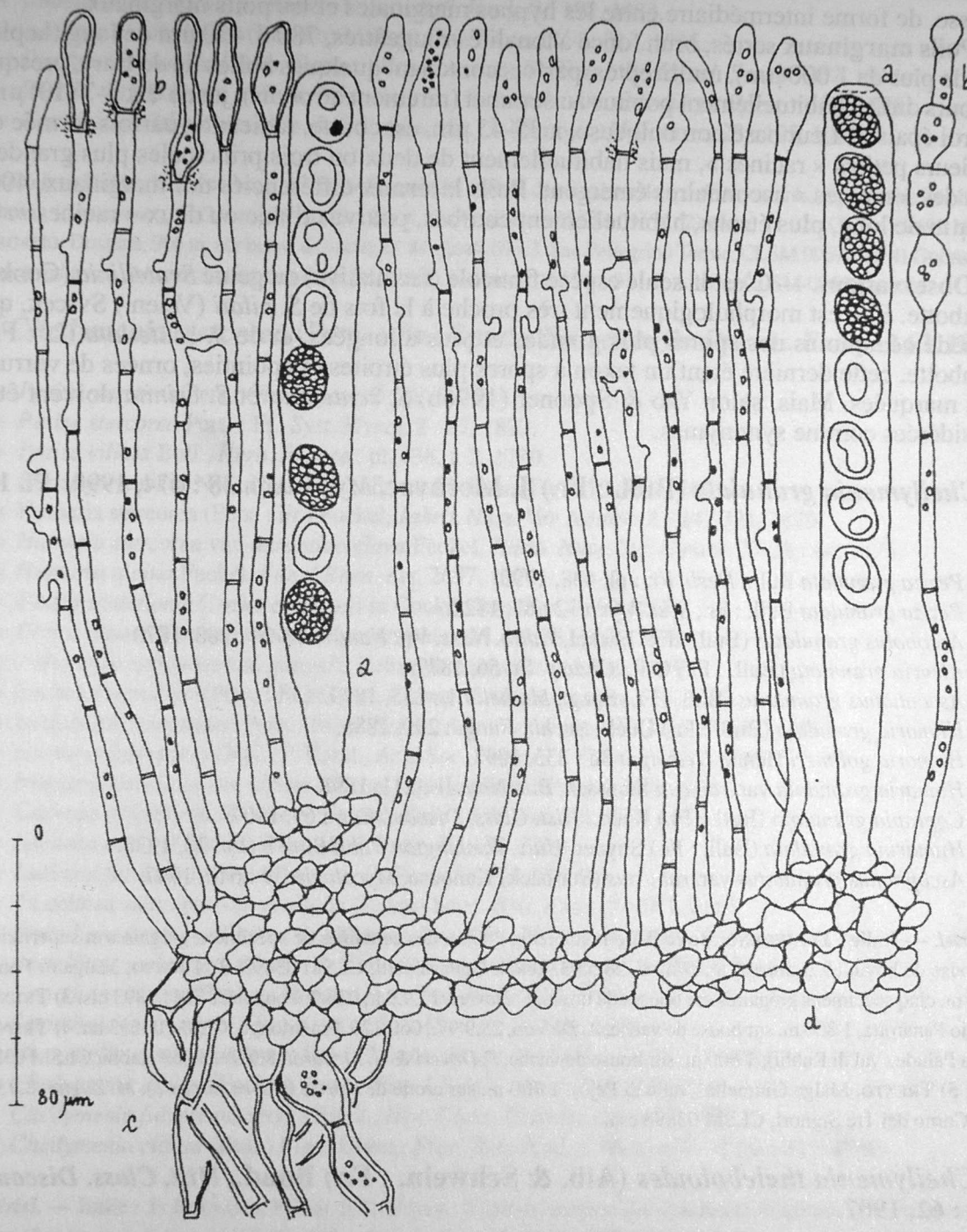


Fig. 2b. — *Scutellinia crinita* : a = asques ; b = paraphyses ; c = excipulum médullaire ; d = sous-hyménium.

Fig.2b (Scutellinia crinita): a = asci; b = paraphyses; c = medullary excipulum; d = subhymenium.

≡ *Scutellinia michiganensis* (Povah) Povah, *Papers Mich. Acad. Sci.* 20 : 130, 1935.
≡ *Humaria coprinaria* (Cooke) Kanouse, *Mycologia* 39 : 655, 1947.

Matériel. — **Italie : 1) BERGAMO,** Schilpario, 1 250 m, quelques spécimens grégaires, superficiels, sur bouses de bovins (*Bos taurus*), *G. Medardi*, 10.89., 057.3. Schilpario, MCVE 575. **2) LIVORNO,** Botro delle Fontanelle, 200 m, quelques

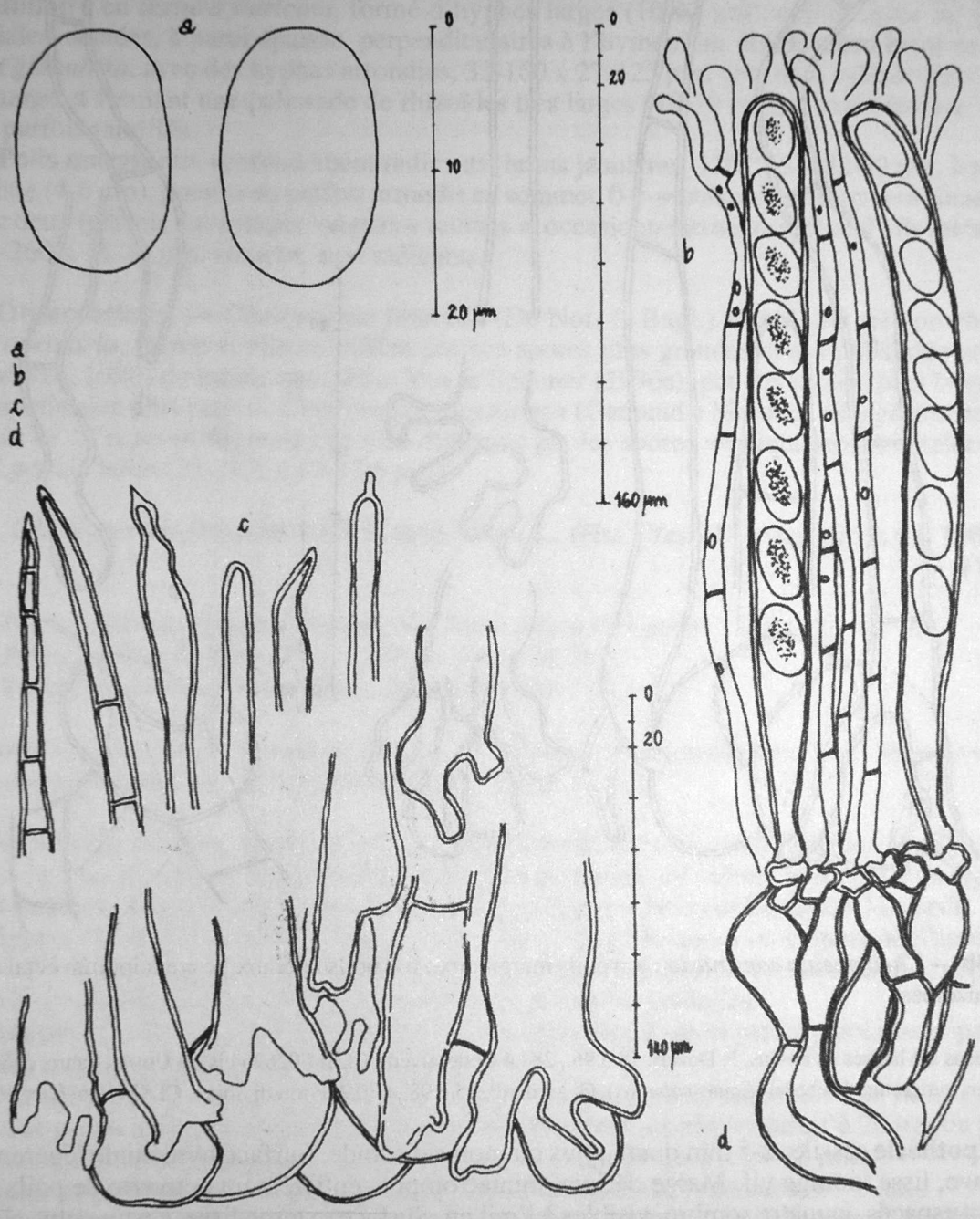


Fig. 3a — ***Cheilymenia coprinaria*** : a = spores ; b = asques et paraphyses ; c = sommets et bases des poils marginaux ; d = excipulum médullaire.

Fig.3a (Cheilymenia coprinaria): a= spores; b= asci and paraphyses; c= apices and bases of the marginal hairs; d= medullary excipulum.

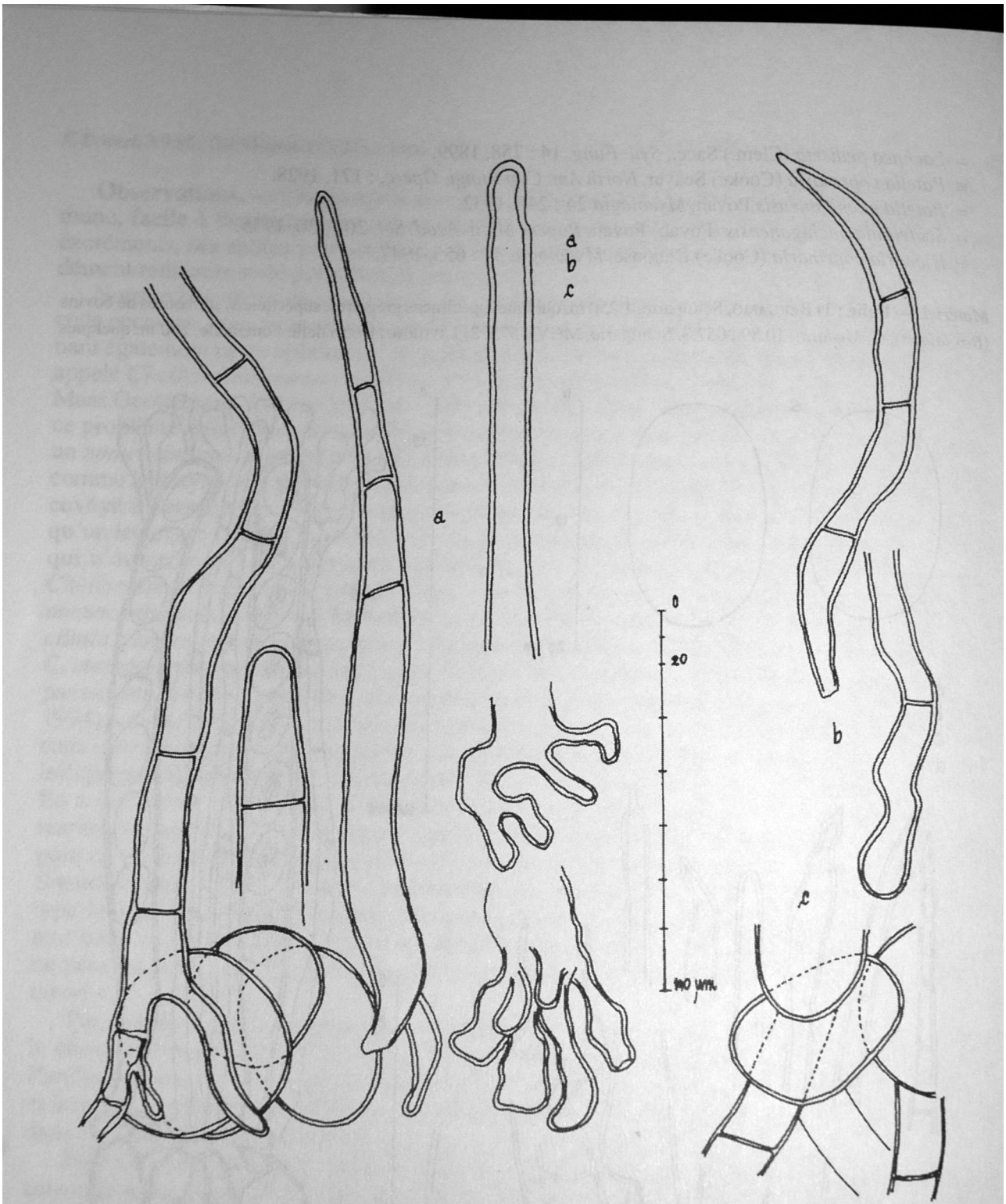


Fig. 3b — *Cheilymenia coprinaria* : a = poils marginaux ; b = poils latéraux ; c = excipulum ectal avec des rhizoïdes.

spécimens sur bouses de bovins, F. Doveri, 18.5.96., 284.4 Collesalvetti, CLSM 02696 bis. 3) UDINE, Sauris di Sopra, 1 400 m, sur crottin de cheval (*Equus caballus*), G. Medardi, 25.6.98., 030.2. Forni di Sopra, CLSM 02696 ter.

Apothécie sessile, 2-5 mm diam., plus ou moins discoïde. Surface hyméniale légèrement concave, lisse, orange vif. Marge définie, ininterrompue, entièrement couverte de poils nettement espacés, jaunâtre sombre, visibles à l'œil nu. Surface externe lisse, à peine plus claire.

Spores 16,8-18,3 x 9,4-10,5 (-11) µm (Q = 1,60-2,00 ; Q_{moyen} = 1,78), uniseriées, ellip-

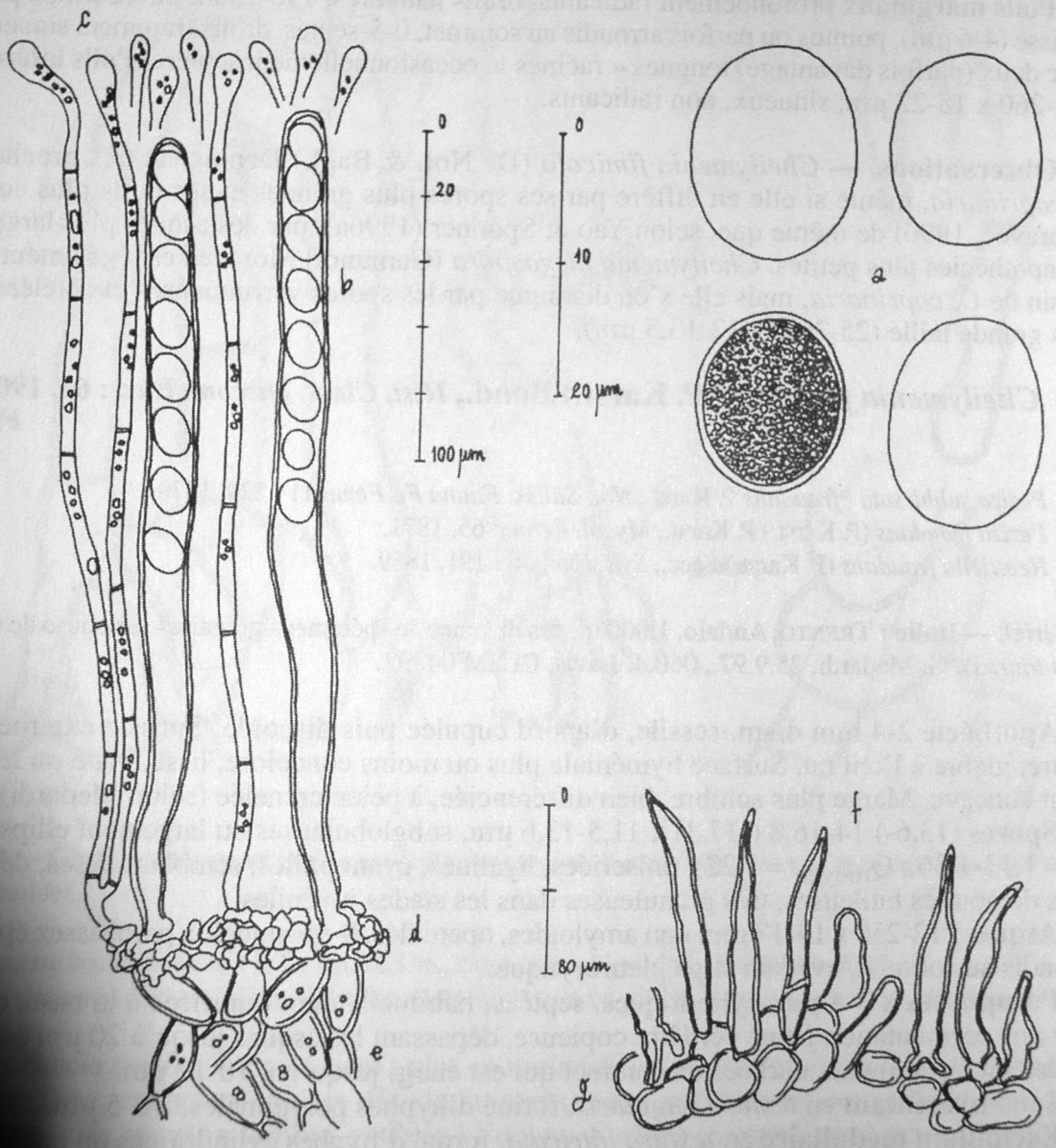
Fig.3b (Cheilymenia coprinaria): a= marginal hairs; b= lateral hairs; c= ectal excipulum with rhizoids.

100 µm, s'étirant vers la marge.

Poils marginaux sétuliformes, 50-200 x 15-19 µm, brun jaunâtre clair, non septés (parfois avec une cloison), à paroi épaisse (1-2 µm), pointus ou rarement arrondis au sommet, légèrement courbés ou sinueux, habituellement à base simple, aplatie ou légèrement pointue (parfois avec deux « racines »). On observe aussi quelques poils intermédiaires entre les soies et les hyphes marginales étirées.

Observations. — En ce qui concerne les caractères différentiels avec *C. rubra*, nous renvoyons aux observations figurant sous cette dernière.

Moravec (1988) a révisé le matériel-type de *C. fraudans* et, de sa description, nous déduisons que notre récolte diffère par quelques détails : les spores sont légèrement plus petites et apparemment lisses, même dans le bleu Coton, alors que les poils sont à peine septés. Moravec (l.c.) a également établi que l'espèce décrite par Gamundí (1960) sous le nom *C. fraudans* ne correspond pas du tout au sens original de Karsten. En fait, les illustrations figurant dans ce



— ***Cheilymenia fraudans*** : a = spores ; b = asques ; c = paraphyses ; d = sous-hyménium ; e = excipulum médullaire ; f = poils marginaux ; g = excipulum ectal.

Fig.4 (Cheilymenia fraudans): a= spores; b= asci; c= paraphyses; d= subhymenium; e= medullary excipulum; f= marginal hairs; g= ectal excipulum.

pourvues de parois devenant lâches après un traitement par ce colorant.

La Section *Pseudoscutelliniae* a été subdivisée en deux séries : 1) ser. *Coprinariae* J. Moravec, caractérisée par de grands poils (jusqu'à 1 200 x 55 µm) et des apothécies jaune-

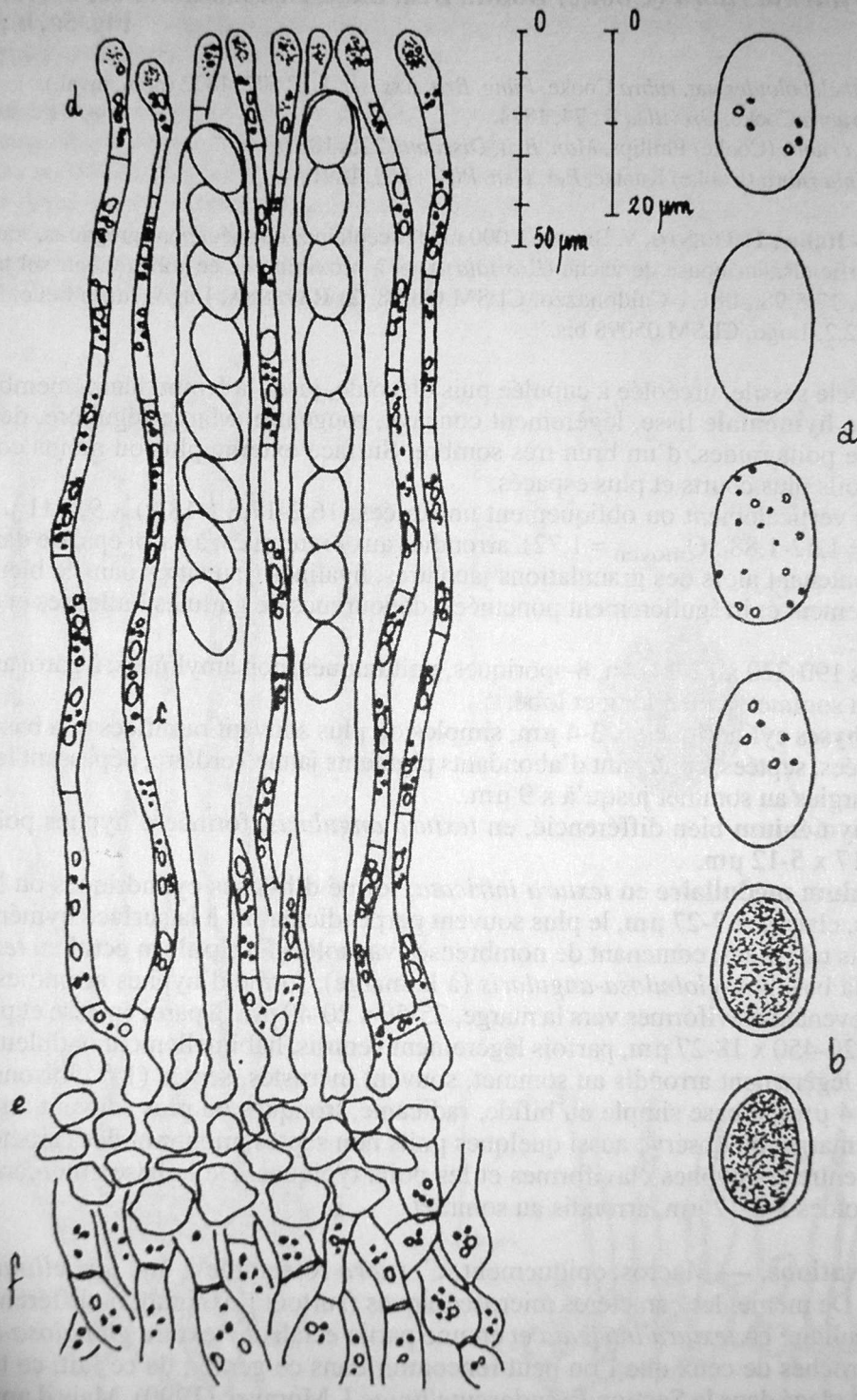


Fig. 5a — *Cheilymenia rubra* : a = spores mûres ; b = spores immatures ; c = asques ; d = paraphyses ; e = sous-hyménium ; f = excipulum médullaire.

Fig.5a (Cheilymenia rubra): a= ripe spores; b= unripe spores; c= asci; d= paraphyses; e= subhymenium; f= medullary excipulum.

orange [*C. coprinaria*, décrit ci-dessus – n° 9 –, appartient à ce groupe, et, sur la base de ses caractères, est facilement séparable des autres *Pseudoscutelliniae* énumérés dans ce travail] ; 2) ser. *Pseudoscutelliniae* J. Moravec, érigés pour les apothécies rouges à orange rougeâtre (très rarement orangé vif) ainsi que pour les poils qui ne dépassent pas 600 µm de long [comme représentants de cette dernière série, nous mentionnons, aux côtés de *C. rubra*, *C. fraudans* (P. Karst.) Boud., *C. humarioides* (Rehm) Gamundí, *C. pseudohumarioides* Dissing, J. Moravec & Sivertsen, *C. liskae* J. Moravec, Fellner & Landa]. Les trois dernières de ces espèces diffèrent de *C. rubra* par leurs spores plus grandes et leurs poils incomplètement pigmentés mais hyalins dans leur tiers sommital (Moravec, 1989a). *C. humarioides*, quand à elle diffère de *C. rubra* aussi par ses apothécies plus petites, moins densément poilues à la marge, de même que par ses spores à paroi formée de trois couches et ornées de verrues plus grossières. Quand à *C. pseudohumarioides*, elle se distingue tant par ses apothécies plus petites et ses poils marginaux plus dispersés que par ses spores largement ellipsoïdes. Finalement, *C. liskae* possède une ornementation sporale plus proéminente et aussi des poils à base multifourchue. Mais chez cette dernière espèce, la taille des apothécies et la densité des poils est très comparable à ce que l'on rencontre chez *C. rubra*. *C. fraudans* mérite une mention spéciale car elle diffère notablement des autres entités appartenant à cette série, et particulièrement de *C. rubra*, par ses spores plus petites et largement ellipsoïdes ou même subglobuleuses, souvent ornées

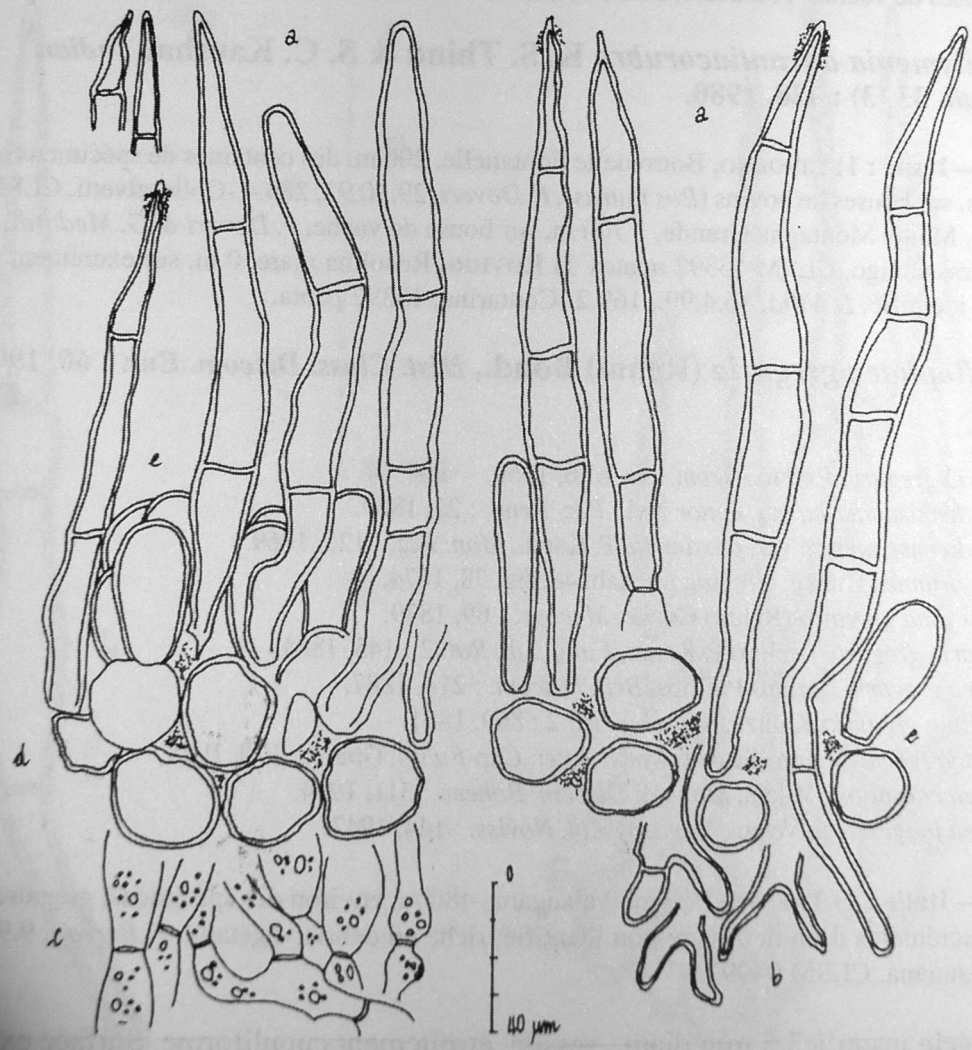


Fig. 5b — *Cheilymenia rubra* : a = poils marginaux ; b = bases des poils ; c = excipulum médullaire ; d = excipulum ectal ; e = excipulum ectal à la marge.

Fig.5b (Cheilymenia rubra): a= marginal hairs, b= bases of the hairs; c= medullary excipulum; d= ectal excipulum; e= ectal excipulum at the margin.

devenant brun foncé en séchant.

Spores obliquement unisériées, 20-24,5 (-28,3) x (10,5-) 11-12 (-13,5) µm, étroitement ellipsoïdes à fusiformes (Q = 1,81-2,36 ; Q_{moyen} = 2,02), arrondies ou légèrement apointies aux extrémités, à paroi épaisse, hyalines, lisses mais ornées à maturité de petites (longueur et largeur vers 0,5 µm) verrues arrondies et épaisses, contenant une ou deux grandes guttules huileuses.

Asques 212-225 x 12,5-15 µm, non amyloïdes, operculés, cylindriques, 8-sporiques, facilement collapsés et, en conséquence, difficilement observables.

Paraphyses x 2,5-3,5 µm, cylindriques, septées, dépassant seulement les asques de quelques µm, ramifiées ou non à la base, renfermant peu de vacuoles non pigmentées, légèrement clavées au sommet (jusqu'à x 5 µm).

Excipulum médullaire en *textura intricata*. **Excipulum ectal** en *textura angularis*, évoluant en *textura globulosa-angularis* vers l'extérieur, formé d'hyphes subglobuleuses ou polygonales, brun sombre, à parois épaisses, x 17-38 µm, devenant cylindriques ou claviformes vers la marge.

Poils marginaux 190-388 x 12-17,5 µm, souvent fasciculés, brun sombre, faiblement

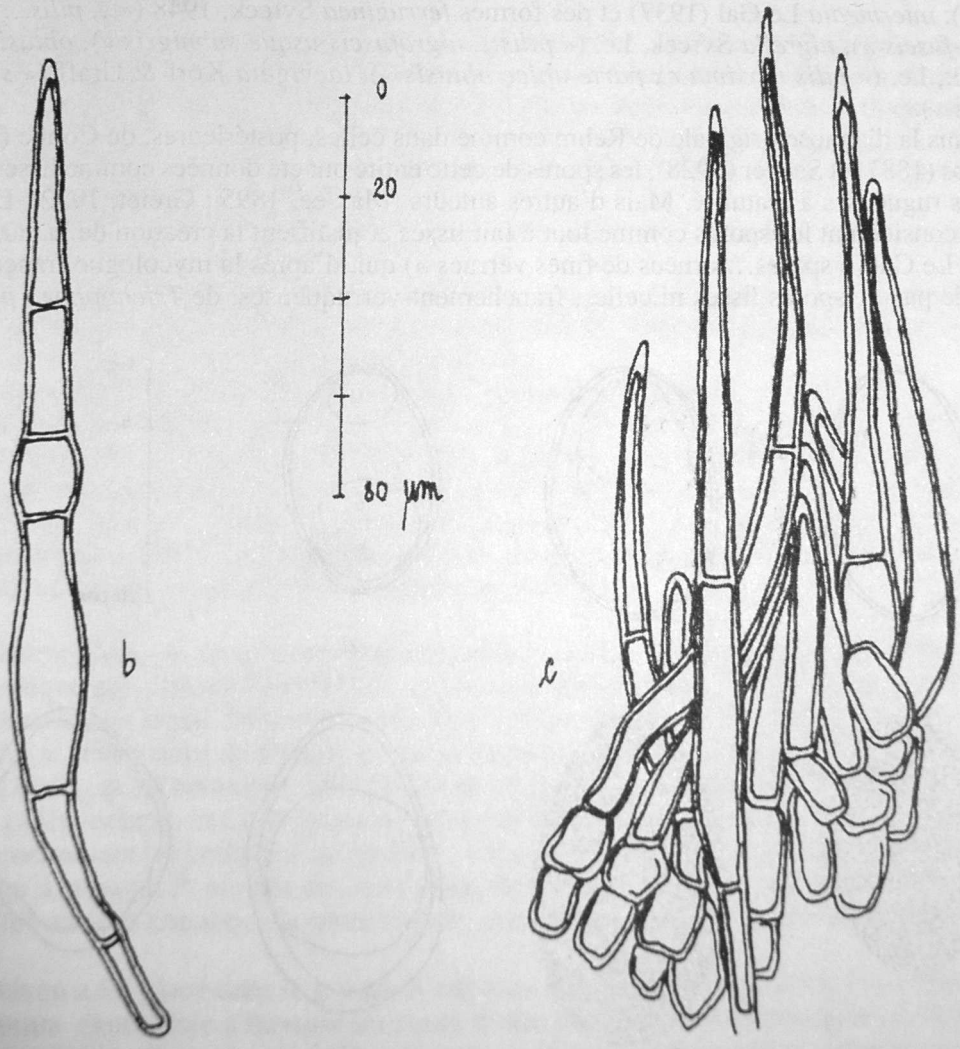


Fig. 6a — Trichophaea gregaria : a = section longitudinale d'une apothécie ; b-c = poils marginaux.

Fig.6a (Trichophaea gregaria): a= longitudinal section of an apothecium; b-c= marginal hairs.

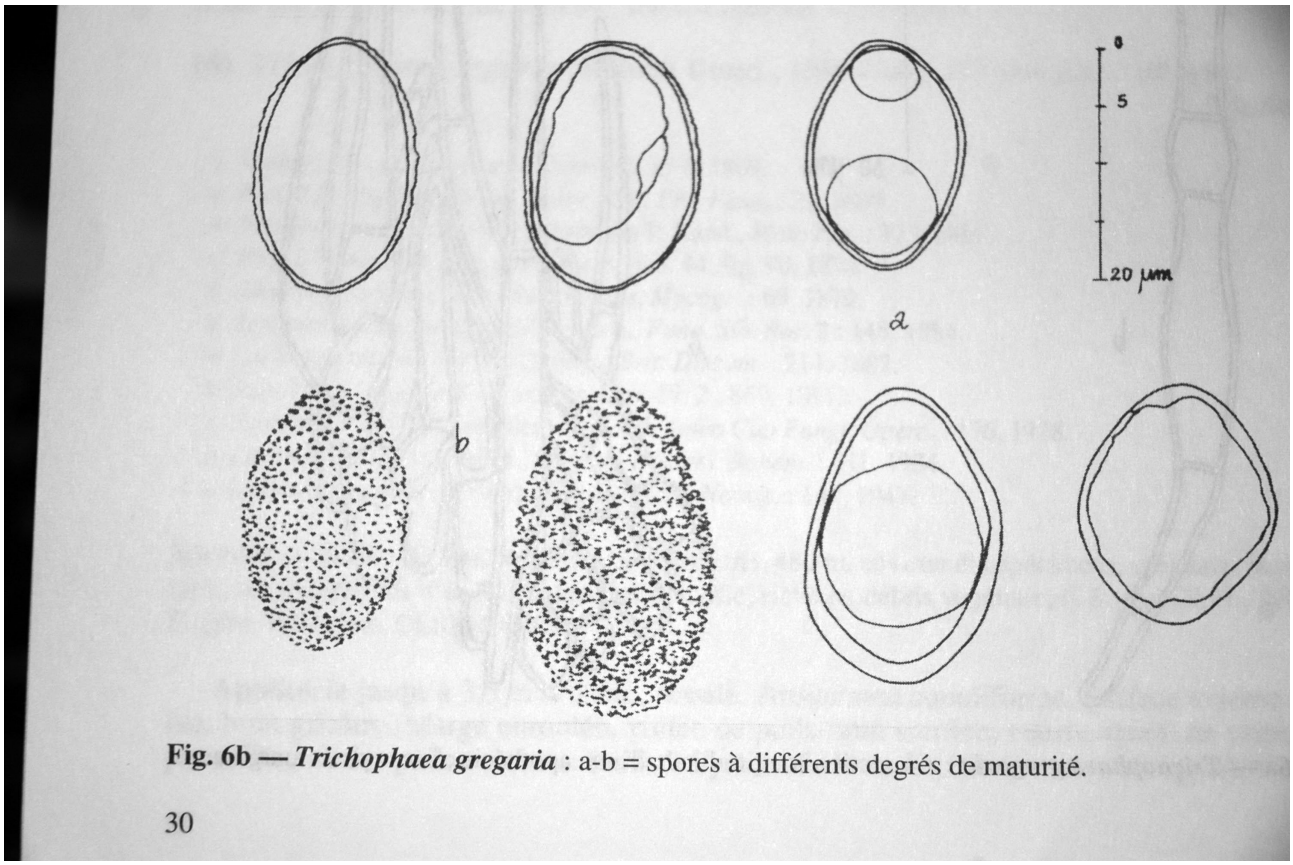


Fig. 6b — *Trichophaea gregaria* : a-b = spores à différents degrés de maturité.

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Fig.6b (Trichophaea gregaria): a-b= spores in various ripening stages.

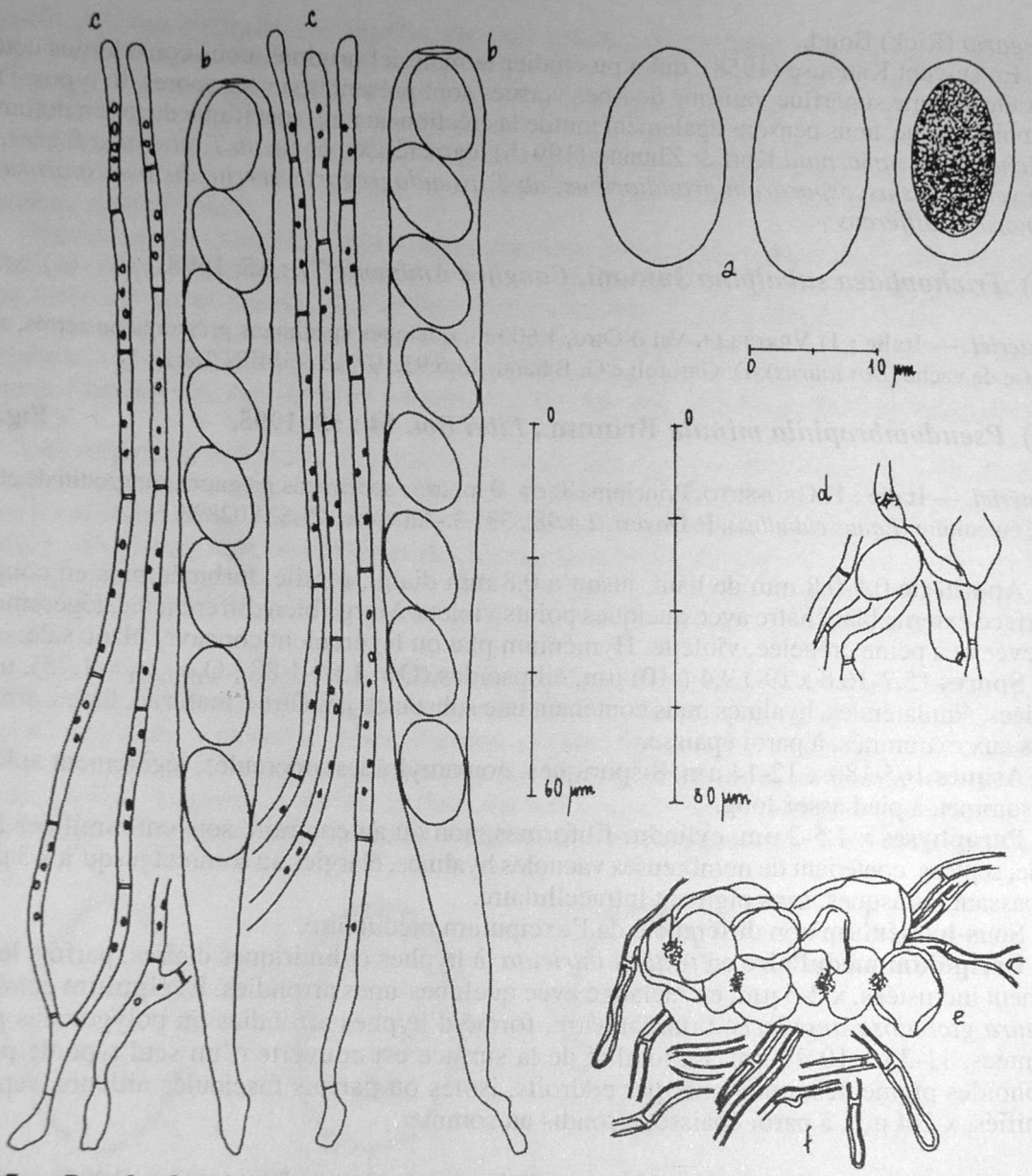


Fig. 7 — *Pseudombrophila minuta* : a = spores ; b = asques ; c = paraphyses ; d = excipulum médullaire ; e = excipulum ectal ; f = poils.

ginea (Svrcek & Moravec) Brumm. et de *Pseudombrophila theioleuca* Rolland (les deux autres espèces de ce groupe) par ses apothécies très petites. En comparaison, le premier montre également des spores nettement plus grandes, alors que le second a des spores plus larges et donc un rapport longueur/largeur plus petit (van Brummelen, 1995).

Les spécimens de notre récolte sont plus clairs et légèrement plus grands que le typus et possèdent des asques plus longuement stipités. Les autres caractères sont complètement superposables.

17) *Pseudombrophila merdaria* (Fr.) Brumm., *Libri Bot.* 14 : 45, 1995.

Fig. 8 ; Pl. 2-a

Fig.7 (Pseudombrophila minuta): a= spores; b= asci; c= paraphyses; d= medullary excipulum; e= ectal excipulum; f= hairs.

Apothécie jusqu'à 1,5 mm diam., d'abord subglobuleux, ensuite subconique, discoïde ou pulviné en mûrissant, courtement stipité. Surface hyméniale aplatie ou convexe, lisse, rose très clair ou blanchâtre. Surface externe tomenteuse, brun clair. Marge brunâtre, crénelée. Mycélium peu abondant. Sclérote absent.

Spores 12,6-14,1 x 7,3-8,4 µm, ellipsoïdes (Q = 1,52-1,84 ; Q_{moyen} = 1,67), à peine appointies aux extrémités, unisériées, hyalines, lisses (imperceptiblement ponctuées à maturité), contenant souvent une bulle gazeuse de de Bary, à paroi assez épaisse, parfois s'épaississant à une extrémité qui ressemble alors à un apicule.

Asques 110-130 (-150) x 8-11 µm, 8-sporiques, operculés, non amyloïdes, cylindriques, longuement stipités et arrondis au sommet.

Paraphyses x 1,5-2,0 µm, cylindro-filiformes, contenant quelques vacuoles jaunâtres très clair, septées, ramifiées à tous les niveaux mais particulièrement au sommet où elles s'épais-

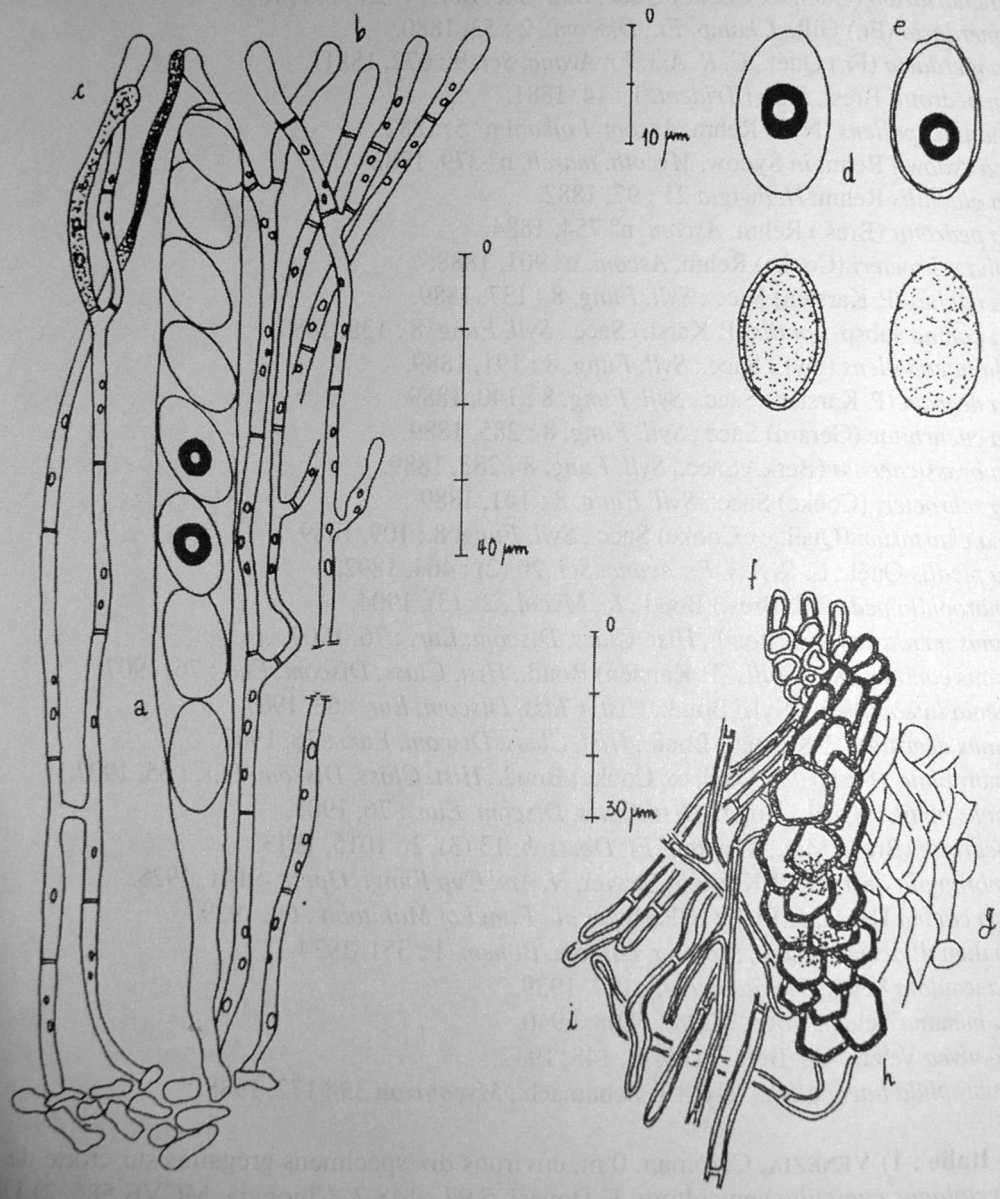


Fig. 8 — *Pseudombrophila merdaria* : a = asque ; b-c = paraphyses ; d-e = spores ; f = poils moniliformes de la marge ; g = excipulum médullaire ; h = excipulum ectal ; i = poils.

Fig.8 (Pseudombrophila merdaria): a= ascus; b-c= paraphyses; d-e= spores; f= moniliform hairs at the margin; g= medullary excipulum; h= ectal excipulum; i= hairs.

coupe aplatie ou parfois discoïde. Surface hyméniale lisse, concave ou plate, parfois ombiliquée, brun rougeâtre. Marge bien différenciée, régulière mais crénelée en mûrissant, rarement lobée, brun sombre. Surface externe brunâtre, tomenteuse, parfois également pruineuse.

Spores 16,8-20,4 x (7,8-) 8,4-9,4 µm (Q = 1,88-2,43 ; Q_{moyen} = 2,06), étroitement ellipsoïdes, rarement subcylindriques, parfois légèrement asymétriques, arrondies (parfois à peine apointies) aux extrémités, hyalines, lisses, ponctuées à maturité, à paroi épaisse, dépourvues de guttules huileuses et de bulles gazeuses, régulièrement et obliquement unisériées.

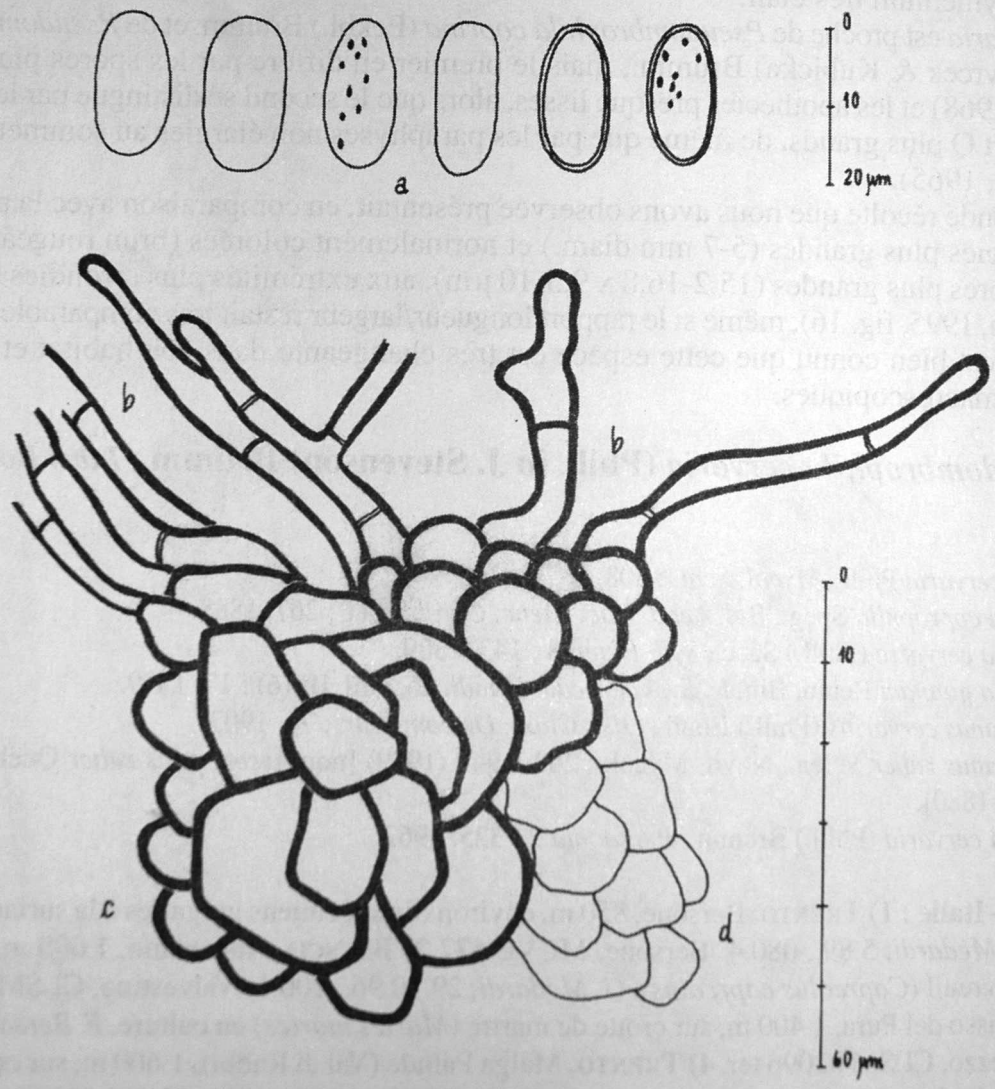
Asques non amyloïdes, cylindriques, 8-sporiques, jusqu'à 180 µm x 12-13 µm.

Paraphyses cylindriques, septées, légèrement élargies au sommet, ramifiées.

Excipulum médullaire en *textura angularis,* formé d'hyphes polygonales, à paroi claire.

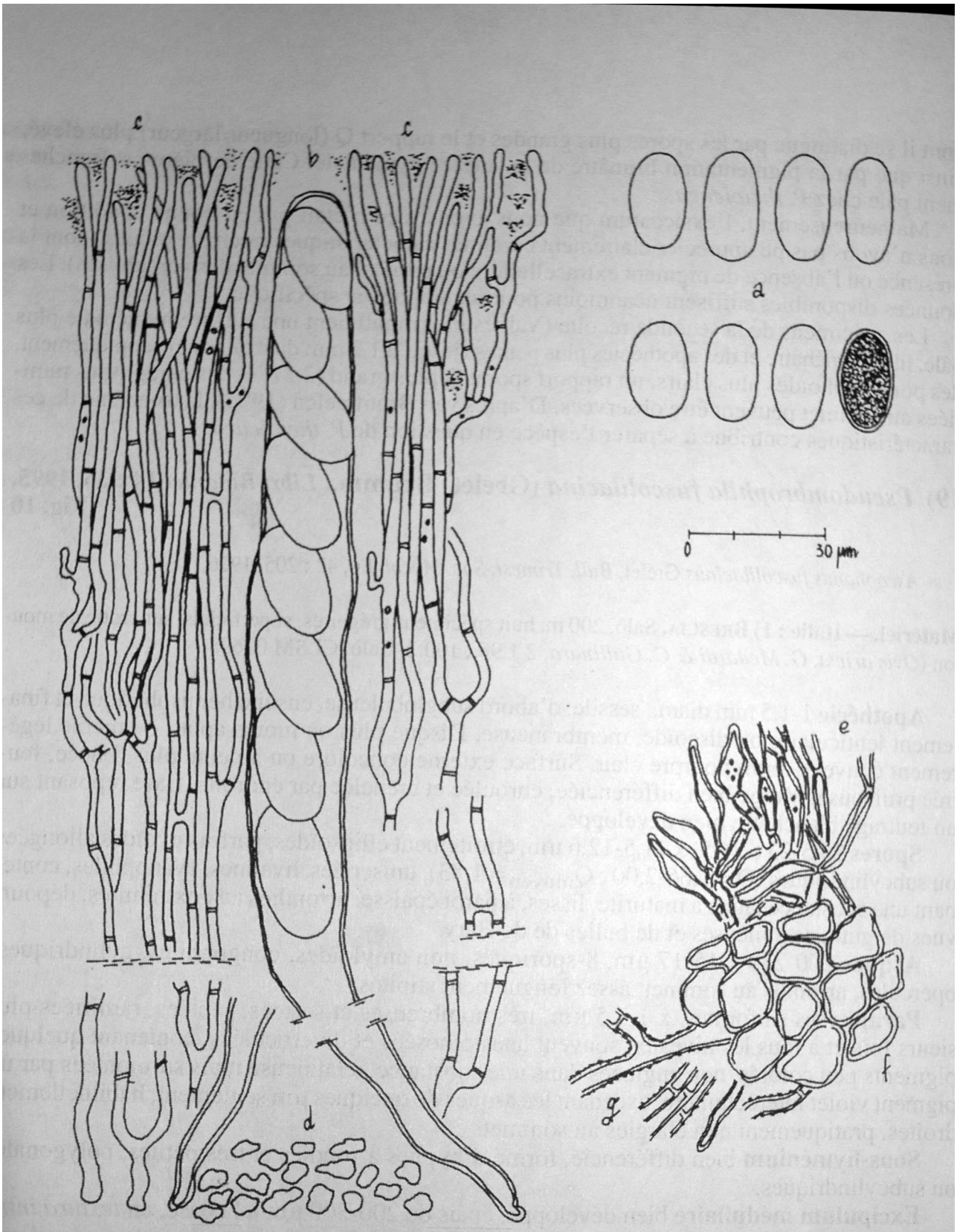
Excipulum ectal en *textura globulosa-angularis,* à hyphes polygonales ou arrondies, 15-50 x 11-45 µm, à paroi épaisse et brunâtre. Les hyphes externes et marginales sont plus petites et à tendance globuleuse (7-12 x 7-9 µm). La surface externe est entièrement couverte de poils hyphoïdes brunâtres, sinueux, septés, ramifiés, arrondis au sommet, à paroi épaisse, plus épars et plus courts à la marge, souvent fasciculés, dépassant 100 µm de long, x 3-6 µm.

Observations. — *P. cervaria* est très proche de *Pseudombrophila theioleuca* Rolland,



9 — ***Pseudombrophila cervaria*** : a = spores ; b = poils ; c = excipulum ectal ; d = excipulum médul-

Fig.9 (Pseudombrophila cervaria): a= spores; b= hairs; c= ectal excipulum; d= medullary excipulum.



. 10 — ***Pseudombrophila fuscolilacina*** : a = spores ; b = asque ; c = paraphyses ; d = sous-hyménium ; e = excipulum médullaire ; f = excipulum ectal ; g = poils.

e la taille des spores était superposable à celle que nous avons mesurée. L'espèce la plus che de *P. fuscolilacina* est *Pseudombrophila hepatica* (Batsch) Brumm., qui se distingue nmoins par les apothécies et les spores plus grandes (le rapport sporal longueur/largeur

Fig.10 (Pseudombrophila fuscolilacina): a= spores; b= ascus; c= paraphyses; d= subhymenium; e= medullary excipulum; f= ectal excipulum; g= hairs.

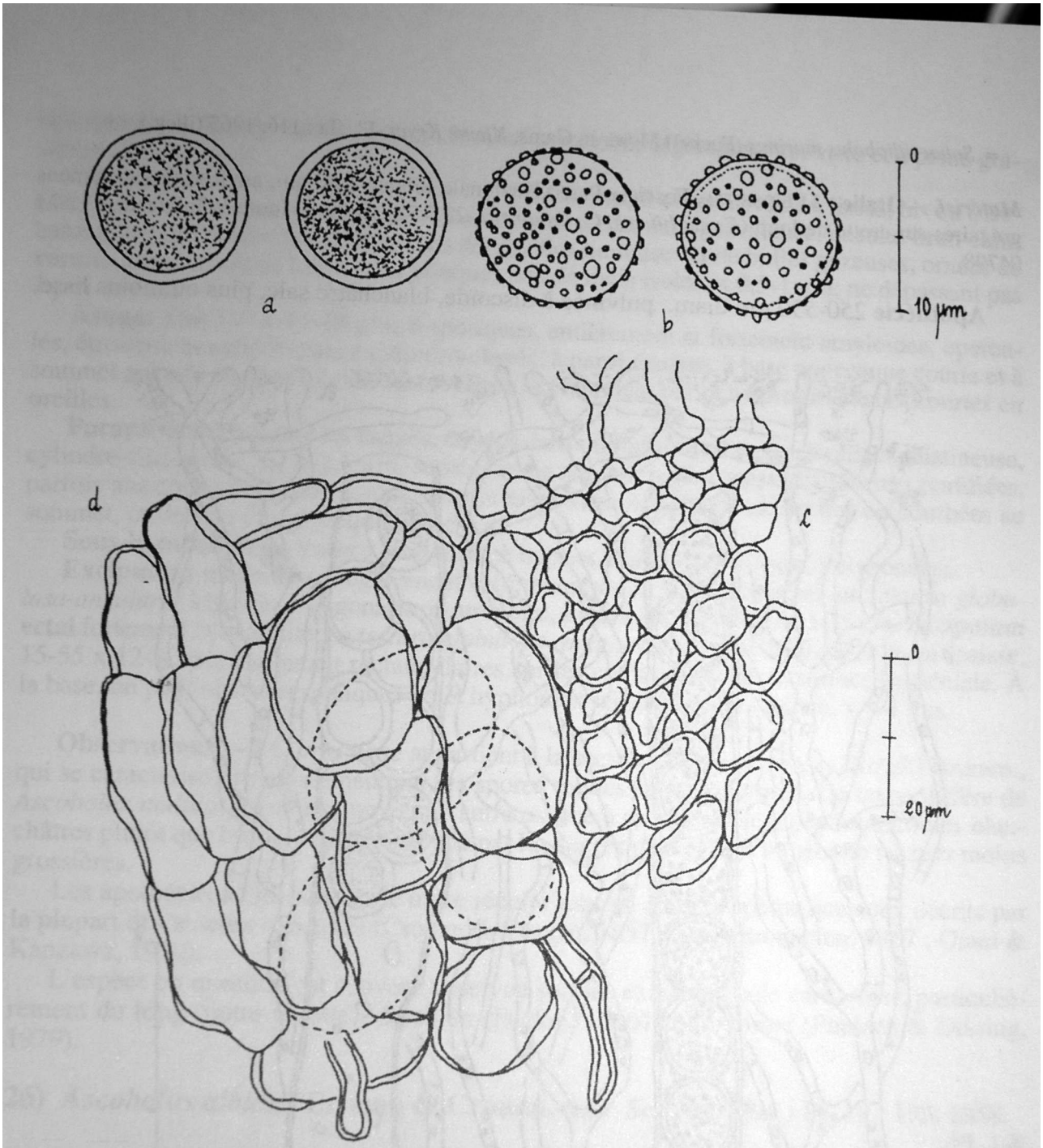


Fig. 11a. — ***Ascobolus brassicae*** : a = spores immatures ; b = spore mûre ; c = sous-hyménium et excipulum médullaire ; d = excipulum ectal.

= *Sphaeridiobolus hyperboreus* (P. Karst.) Heimerl, *Jber. k. k. Ober-Realschule Bez. Sechshaus Wien* 15 : 12, 1889.
= *Boudiera hyperborea* (P. Karst.) Sacc., *Syll. Fung.* 8 : 513, 1889.
= *Cubonia boudieri* (Renny) Sacc., *Syll. Fung.* 8 : 528, 1889.
= *Boudiera canina* (Fuckel) J. Schröt., *Krypt.-Fl. Schles.* 3 (2) : 55, 1893.
= *Boudiera kirschsteinii* Henn., *Verh. Bot. Ver. Prov. Brandenburg* 40 : 26, 1898.
≡ *Sphaeridiobolus brassicae* (Crouan & Crouan) Boud., *Hist. Class. Discom. Eur.* : 74, 1907.
= *Sphaeridiobolus albofuscus* var. *murinus* (Fuckel) Boud., *l. c.* : 74, 1907.
= *Sphaeridiobolus albofuscus* (Crouan & Crouan) Boud., *l. c.* : 74, 1907.
= *Sphaeridiobolus hyperboreus* var. *niveus* (Quél.) Boud., *l. c.* : 73, 1907.
= *Sphaeridiobolus kirschsteinii* (Henn.) Boud., *l. c.* : 73, 1907.

Fig.11a (Ascobolus brassicae): a= unripe spores; b= ripe spore; c= subhymenium and medullary excipulum; d= ectal excipulum.

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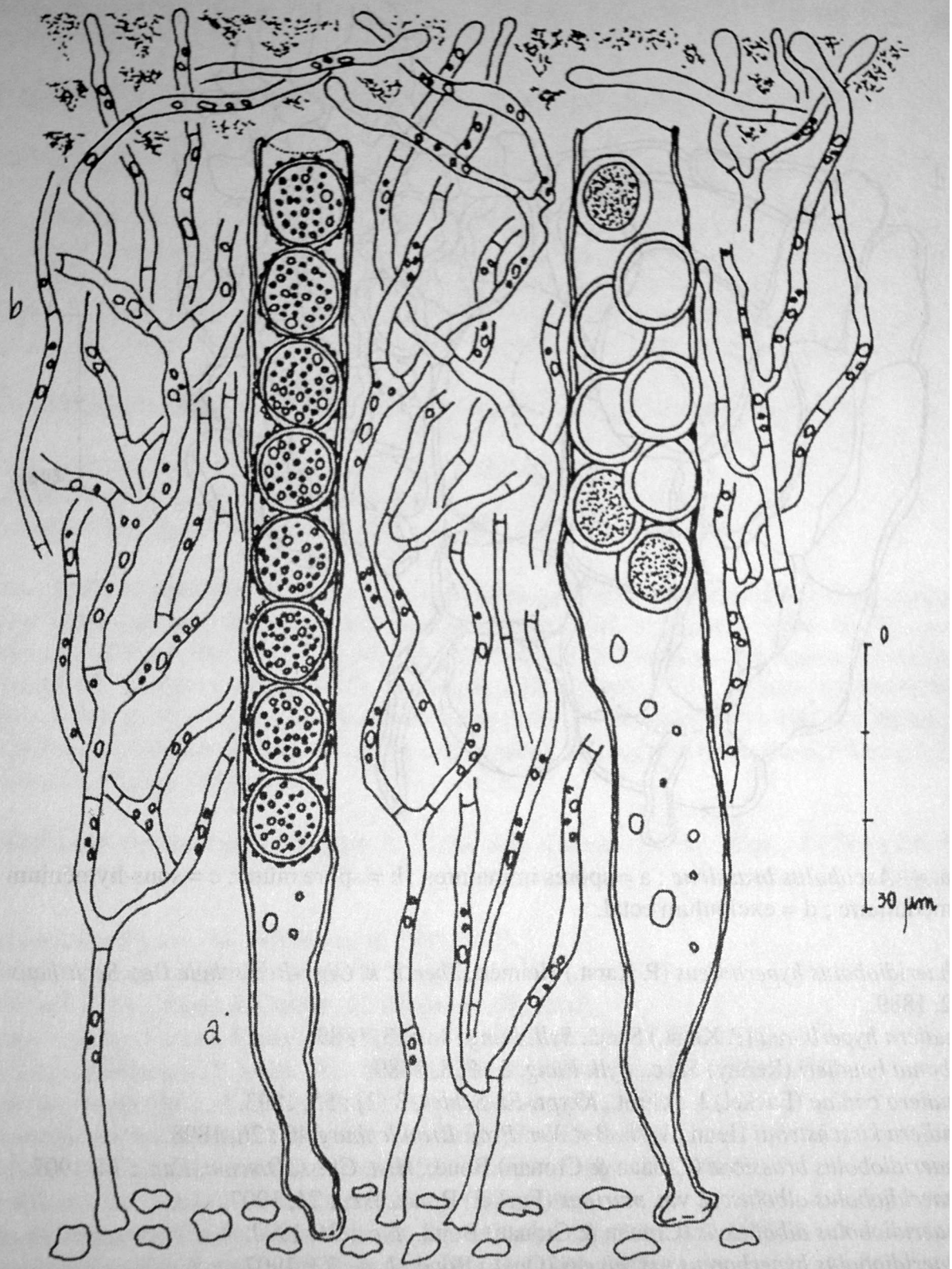
Apothécie 250-550 µm diam., pulvinée à discoïde, blanchâtre sale, plus ou moins

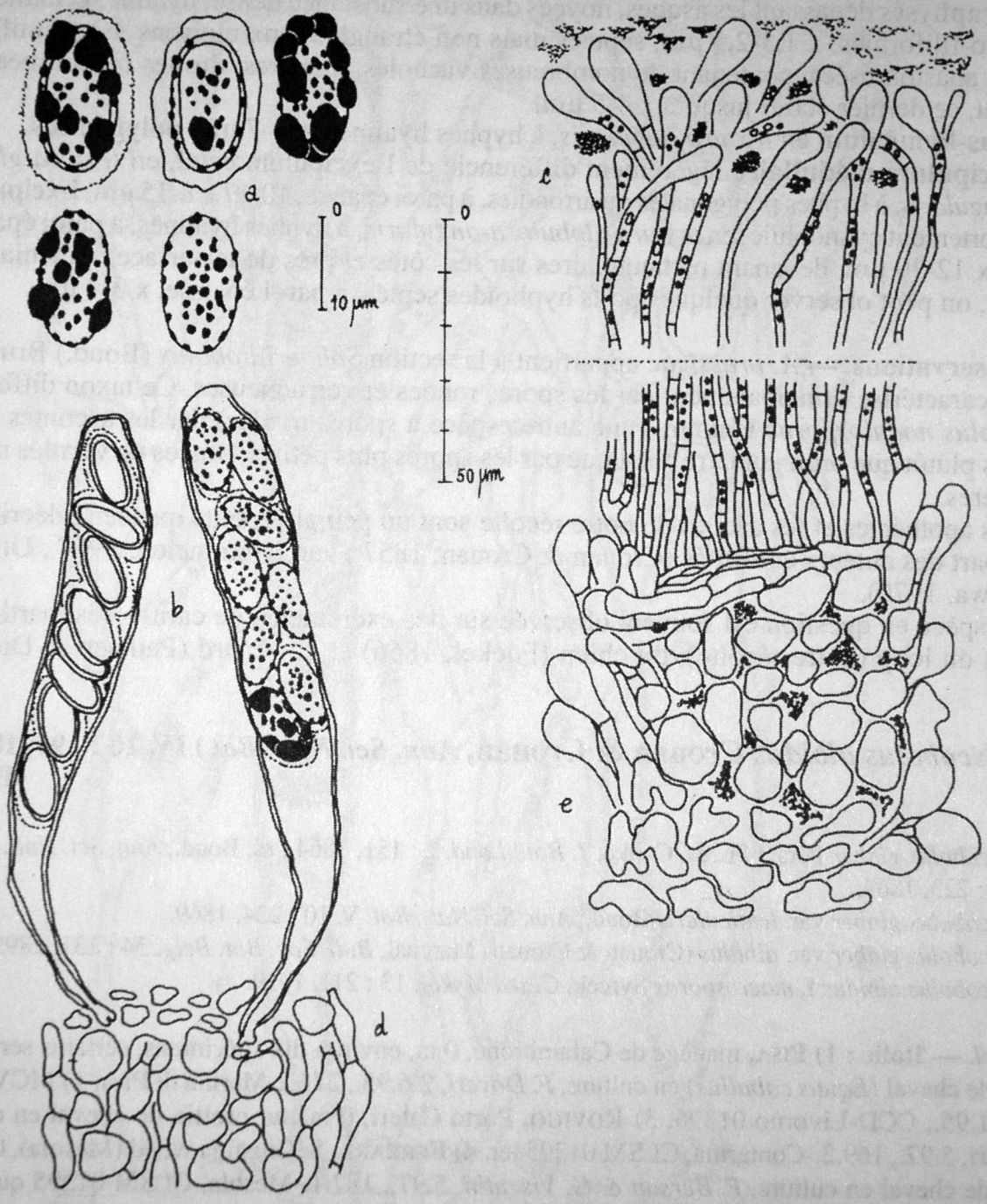


g. 11b — *Ascobolus brassicae* : a = asque ; b = paraphyses.

Fig.11b (Ascobolus brassicae): a= ascus; b= paraphyses.

***Matériel.* — Italie : 1) UDINE,** Forra di Fleons, 1 400 m, environ dix spécimens grégaires, superficiels, sur crotte de cerf (Cervus elaphus) en culture, F. Bersan & F. Doveri, 26.6.98., 031.1.-Rigolato, CLSM 04998.

Apothécie sessile, 500-750 µm diam., 300-400 µm de haut, en cône renversé, s'aplatissant en vieillissant, membraneuse. Surface externe violet clair, couverte de granules pourpre, spécialement près de la marge qui est bien différenciée, à peine crénelée. Surface hyméniale violette, légèrement concave, granuleuse par les asques mûrs qui font saillie à maturité.



12 — *Ascobolus aff. cainii* : a = spores ; b = asques ; c = paraphyses ; d = excipulum médullaire ; excipulum ectal.

Fig.12 (Ascobolus aff. cainii): a= spores; b= asci; c= paraphyses; d= medullary excipulum; e= ectal excipulum.

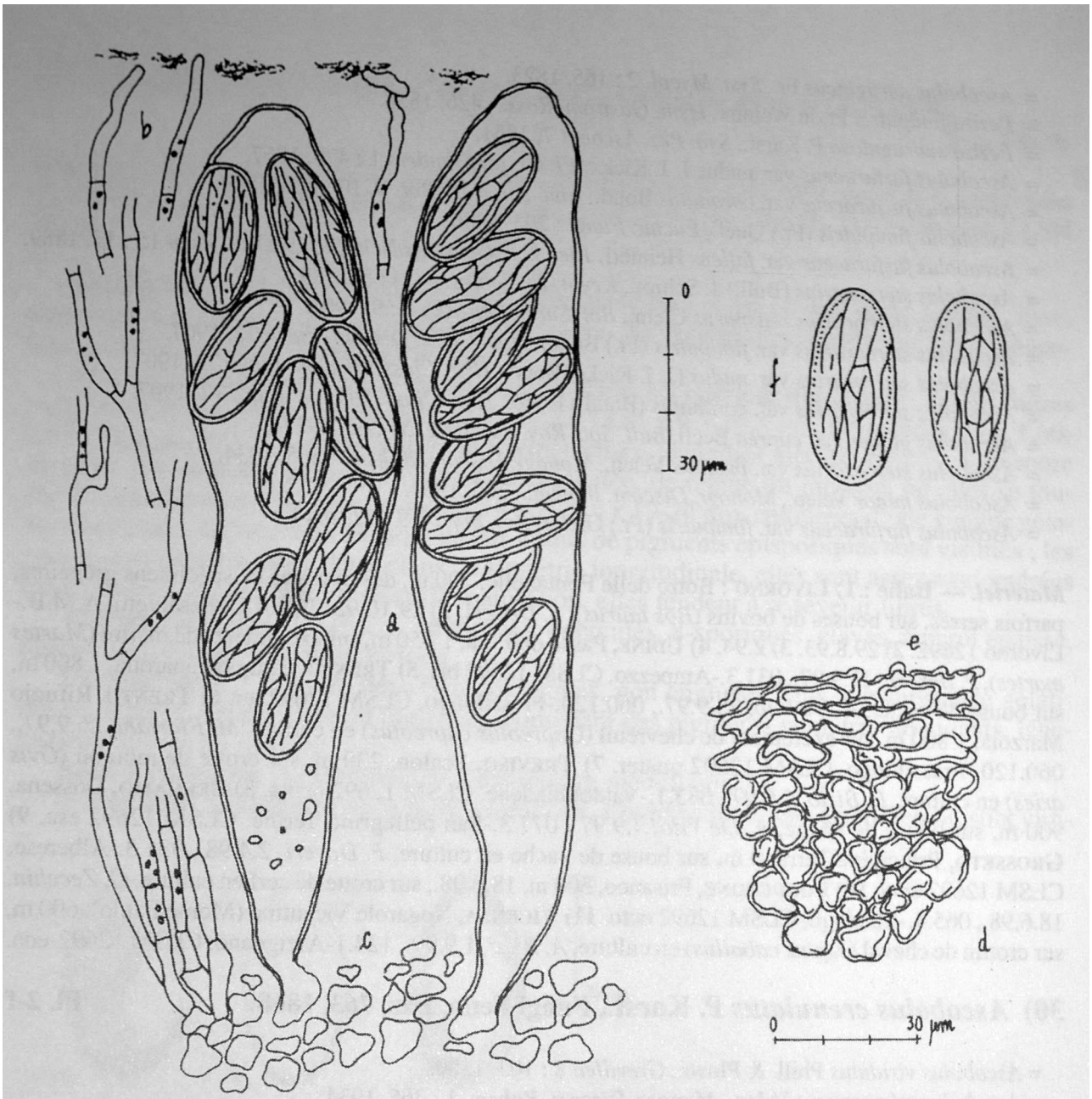


Fig. 13 — ***Ascobolus roseopurpurascens*** : a = asque mûr et spores ; b = paraphyses ; c = sous-hyménium et excipulum médullaire ; d = excipulum ectal dans la partie inférieure de l'ascome ; e = excipulum ectal sur la partie supérieure de l'ascome ; f = spores.

29) *Ascobolus furfuraceus* Pers. : Fr., *Syst. Mycol.* 2 : 163, 1823. **Pl. 1-c**

= *Elvella fimetaria* Scop., *Ann. Hist. Nat.* 4 : 149, 1770.
= *Peziza atra* Huds., *Fl. Angl.* : 637, 1778.
= *Peziza stercoraria* Bull., *Herb. Fr.* : pl. 376, 1787.
= *Peziza fusca* Bolton, *Hist. Fung. Halifax* 3 : tav. 109, 1789.
= *Peziza stercoraria* var. lutea Bull., *Hist. Champ. Fr.* : 256, 1791.
= *Peziza stercoraria* var. *violacea* Bull., *Hist. Champ. Fr.* : 256, 1791.
= *Ascobolus pezizoides* Pers. *in* J. F. Gmel., *C. Linn. Syst. Nat.* 2 : 1461, 1791.
= *Peziza violacea* (Bull.) Rehlan, *Fl. Catabrigiensis, Suppl.* 3 : 31, 1793.
≡ *Ascobolus furfuraceus* Pers., *Obs. Mycol.* 1 : 33, 1796.
= *Ascobolus marginatus* Schumach., *Enum. Pl. Saell.* 2 : 437, 1803.

Fig. 13 (Ascobolus roseopurpurascens): a= ripe asci and spores; b= paraphyses; c= subhymenium and medullary excipulum; d= ectal excipulum on the lower part of the ascoma; e= ectal excipulum on the higher part of the ascoma; f= spores.

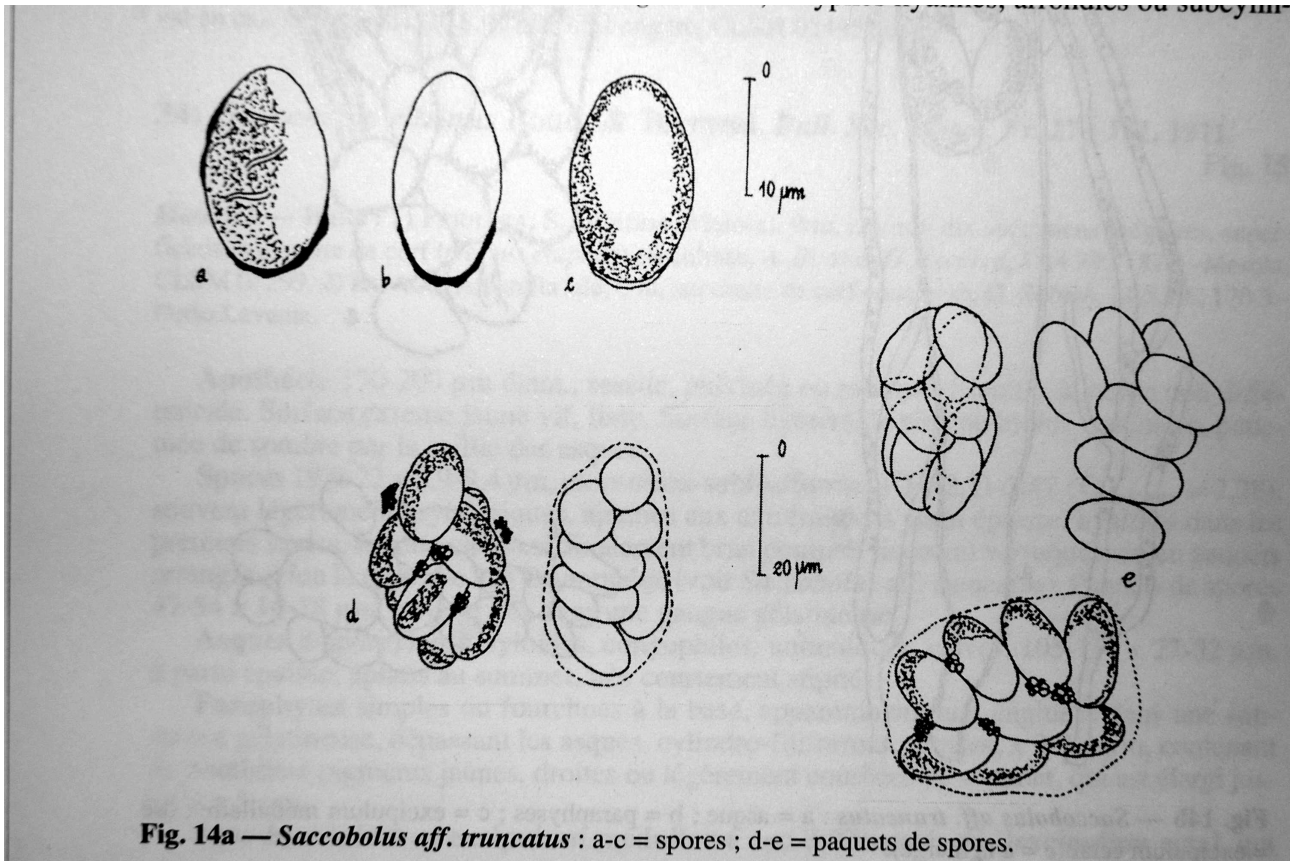


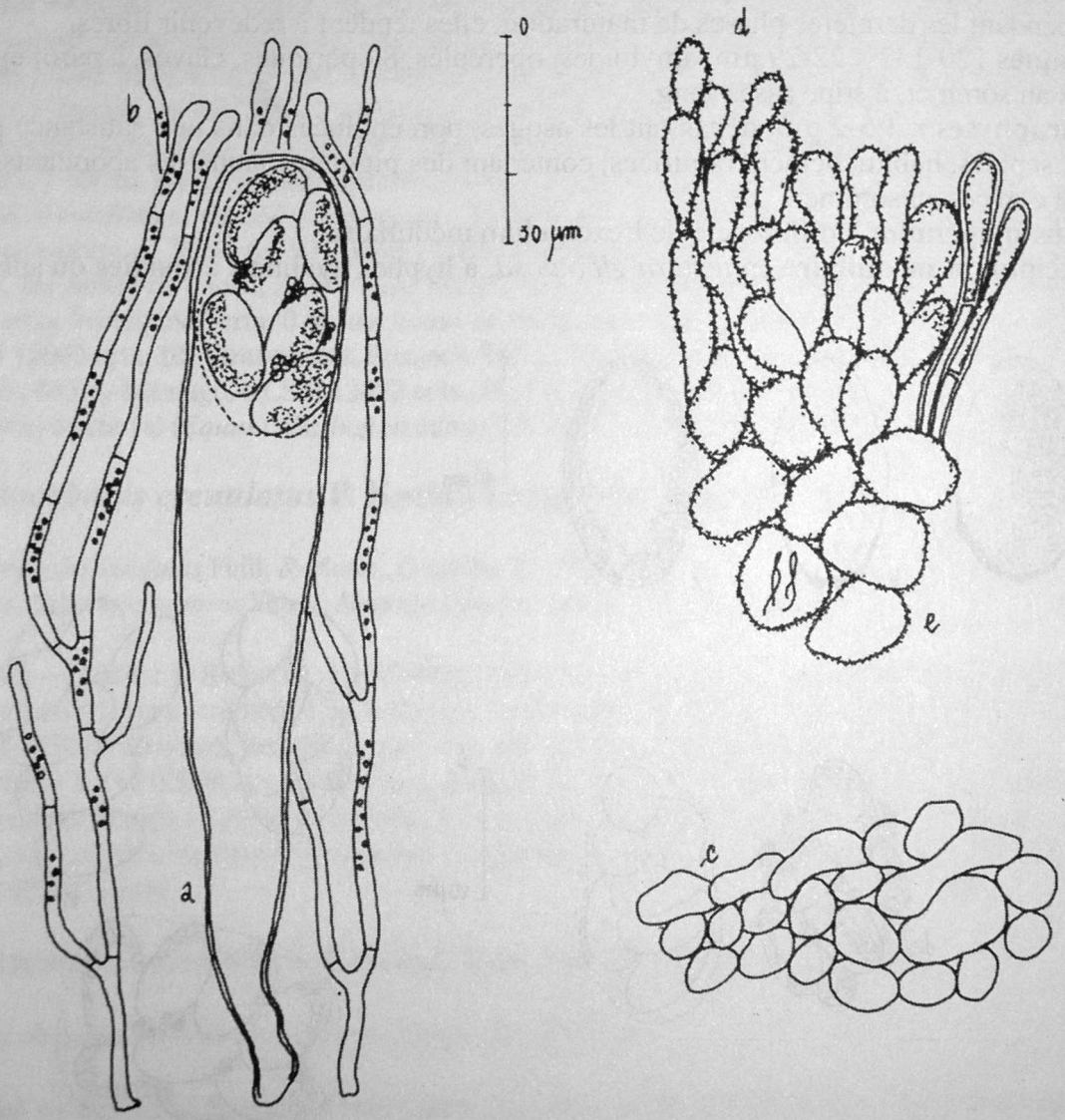
Fig. 14a — *Saccobolus aff. truncatus* : a-c = spores ; d-e = paquets de spores.

Fig.14a (Saccobolus aff. truncatus): a-c= spores; d-e= spore clusters.

driques, 7-15 x 4-9 µm. **Excipulum ectal** en *textura globulosa-angularis*, à hyphes arrondies ou polygonales, 10-20 x 8-16 µm, à pigment pariétal jaunâtre, s'allongeant et finalement clavées (semblables aux paraphyses) près de la marge.

Observations. — L'espèce en question appartient indubitablement à la section *Saccobolus*, caractérisée, d'après van Brummelen (1967), par des apothécies d'une jaune plus ou moins profond, des paraphyses contenant des pigments de cette couleur, des spores disposées en quatre rangées et selon deux plans de symétrie (= « pattern I or Ia » d'après l'auteur hollandais). À l'intérieur de cette section, notre espèce peut être placée entre *Saccobolus truncatus* (tel qu'il est décrit par van Brummelen l.c.) et *S. succineus* Brumm. (1969). Comme le premier, elle montre non seulement des spores ellipsoïdes et symétriques, arrondies aux extrémités mais aussi des apothécies d'un jaune assez profond, qui se développent isolément dans des cavités du substrat, ce qui les rend difficilement visibles. Mais la taille des asques est plus proche de celle de *S. succineus*.

Nous pensons utile de mentionner l'arrangement des spores à l'intérieur de l'asque, qui,



ig. 14b — *Saccobolus aff. truncatus* : a = asque ; b = paraphyses ; c = excipulum médullaire ; d-e excipulum ectal (e = à la marge).

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Fig.14b (Saccobolus aff. truncatus): a= ascus; b= paraphyses; c= medullary excipulum; d-e= ectal excipulum (e= at the margin).

est très mince, en *textura globulosa*, à hyphes x 5-7 µm, jaune clair, arrondies, devenant cylindriques vers la marge où elles s'organisent en rangées serrées.

Observations. — La couleur jaune citron et la très petite taille des apothécies, de même que l'arrangement, la forme et le type d'ornementation des spores caractérisent parfaitement cette espèce.

Saccobolus diffusus Kaushal & Virdi est un taxon très proche de *S. citrinus,* dont il se distingue par les spores un peu plus grandes (20,5-24,5 x 9-10,5 µm) et non ornées.

35) *Saccobolus glaber* (Pers. : Fr.) Lambotte, *Fl. Mycol. Belg., suppl.* 1 : 284, 1887.

≡ *Ascobolus glaber* Pers., *Obs. Mycol.* 1 : 34, 1796.
= *Ascobolus kervernii* Crouan & Crouan, *Ann. Sc. Nat., Bot.* IV, 10 : 193, 1858.
= *Saccobolus kervernii* (Crouan & Crouan) Boud., *Ann. Sc. Nat., Bot.* V, 10 : 229, 1869.
= *Saccobolus granulispermus* Soppitt & Crossl., *Naturalist,* 1899.
≡ *Ascobolus stercorarius* var. *glaber* (Pers. : Fr.) Velen., *Monogr. Discom. Bohem.* 1 : 365, 1934.

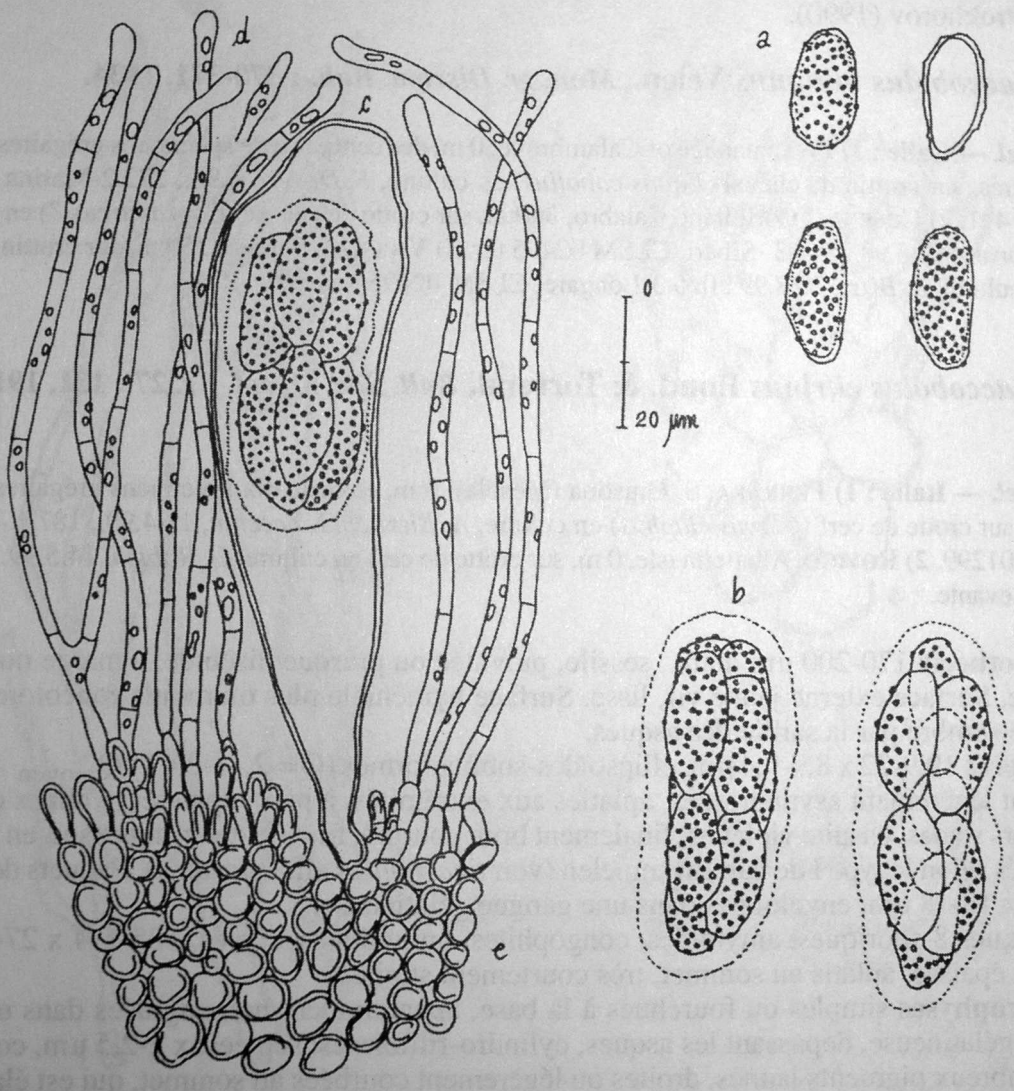


Fig. 15 — ***Saccobolus citrinus*** : a = spores ; b = paquets de spores ; c = asque ; d = paraphyses ; e = excipulum.

Fig.15 (Saccobolus citrinus): a= spores; b= spore clusters; c= ascus; d= paraphyses; e= excipulum

***Matériel.* — Italie : 1) BRESCIA** : Lavenone, 400 m, des dizaines de spécimens grégaires, superficiels, quelques-uns serrés, sur excréments d'un herbivore non identifié, *G. Medardi*, 4.91., 100.4-Vestone, MCVE-ERB2 10748. **2) COSENZA**, San Demetrio Corone (Contrada Poggio), 600 m, sur excrément de sanglier (*Sus scrofa*) en culture, C. Lavorato, 16.5.98., 552.4.-San Demetrio corone, CLSM 02596 ter.

36) *Saccobolus dilutellus* (Fuckel) Sacc., Syll. Fung. 8 : 526, 1889. Fig. 16

≡ *Ascobolus dilutellus* Fuckel, *Hedwigia* 5 : 4, 1866.
= *Saccobolus globulifer* Boud., *Ann. Sci. Nat., Bot.* V, 10 : 232, 1869.
= *Ascobolus globulifer* (Boud.) Gillet, *Champ. Fr., Discom.* : 142, 1883.
= *Ornithascus corvinus* Velen., *Monogr. Discom. Bohem.* 1 : 369, 1934.

***Matériel.* — Italie : 1) ROVIGO,** Porto Caleri, 0 m, des dizaines de spécimens grégaires, superficiels, sur crotte de lapin (*Oryctolagus cuniculus*), *E. Bizio*, 22.11.97., 169.2.-Contarina, CLSM 01098.

Apothécie discoïde, 200-300 µm diam., blanc translucide, membraneuse, lisse. Marge non différenciée. Hyménium plat, ponctué de violet par la saillie des asques mûrs.

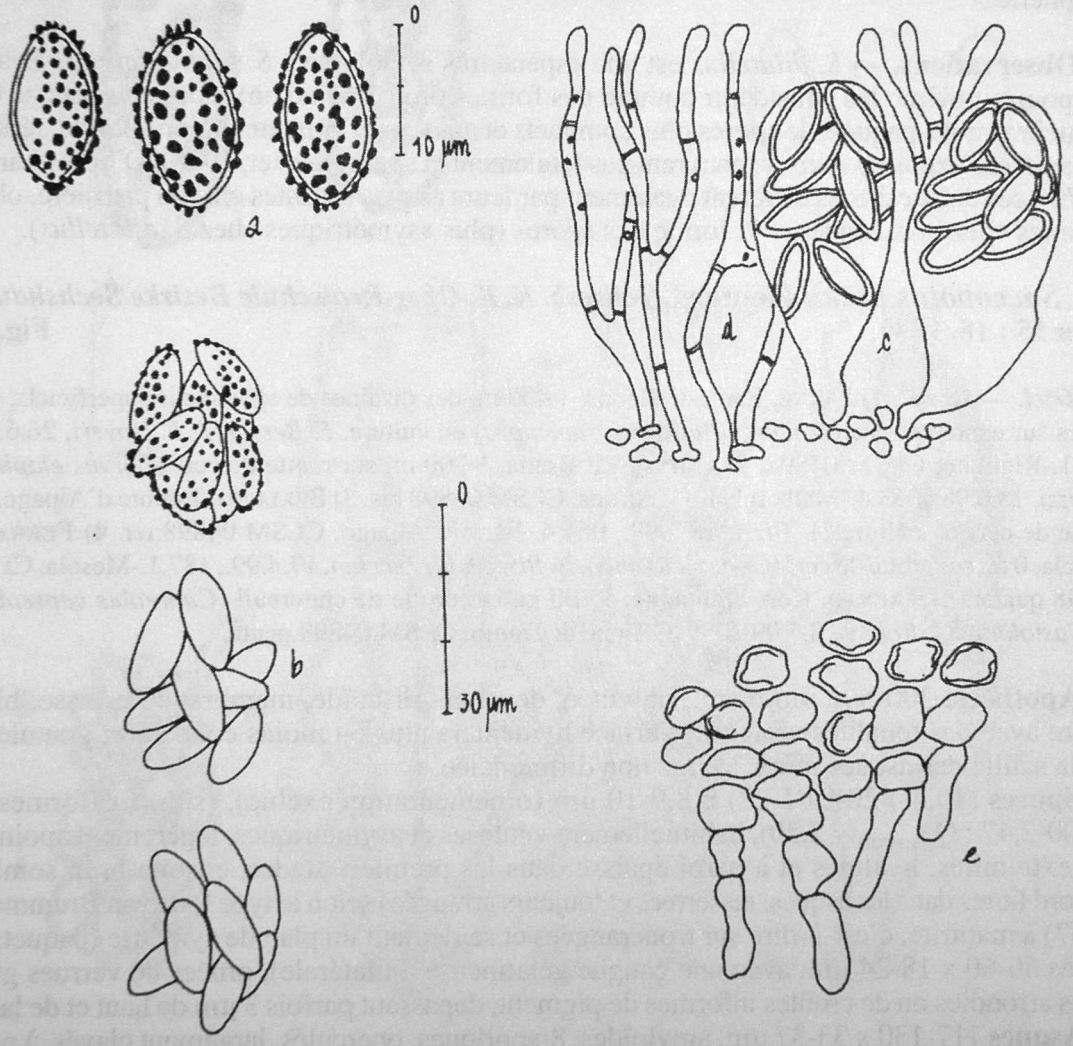


Fig. 16 — *Saccobolus dilutellus* : a = spores mûres ; b = paquets de spores ; c = asque avec spores immatures ; d = paraphyses ; e = excipulum.

Fig.16 (Saccobolus dilutellus): a= ripe spores; b= spore clusters; c= asci with unripe spores; d= paraphyses; e= excipulum.

dans une substance gélatineuse, sans vacuoles colorées mais avec un pigment intracellulaire violet discret, dépassant les asques, élargies au sommet jusqu'à x 6 µm.

Sous-hyménium formé d'hyphes très petites, polygonales ou étroitement cylindriques.

Excipulum médullaire non différencié de l'**excipulum ectal**, celui en *textura globulosa-angularis,* à hyphes arrondies, 5-20 x 5-14 µm, polygonales avec un pigment intercellulaire violet. On observe également quelques hyphes allongées, à extrémités globuleuses ou clavées, semblables aux paraphyses mais à paroi plus épaisse.

Observations. — *S. beckii* se reconnaît, au sein de la section *Eriobolus* Sacc. (apothécies blanches ou violettes, paraphyses sans pigment jaunâtre) par les spores comparativement grandes, ornées de verrues grossières et de croûtes et organisées selon le type II de van Brummelen.

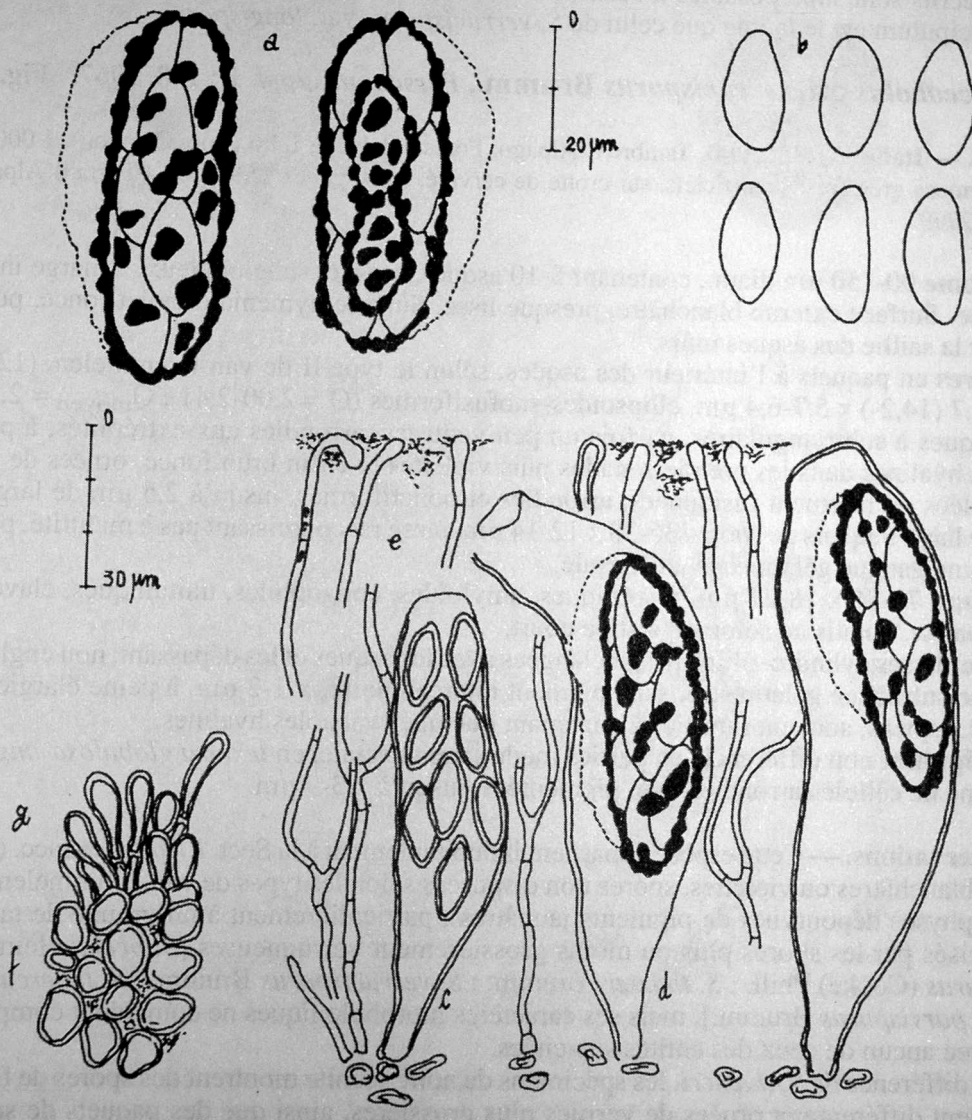


Fig. 17 — ***Saccobolus beckii*** : a = paquets de spores ; b = spores ; c = asque immature avec spores ; d = asque mûr et spores ; e = paraphyses ; f-g = excipulum.

Fig.17 (Saccobolus beckii): a= spore clusters; b= spores; c= unripe ascus and spores; d= ripe asci and spores; e= paraphyses; f-g= excipulum.

spores plus grandes et des paquets de spores avec deux gangues gélatineuses polaires. Chez *S. beckii*, les spores sont comparativement plus grandes et couvertes d'un pigment plus épais (jusqu'à 3 µm). *S. parvisporus* (Brummelen, 1976) possède des spores plus petites et des asques très longuement pédicellées.

D'une manière générale, l'espèce que nous avons étudiée est plus proche de *S. verrucisporus* (en raison de la taille des ascomes et de la forme et de l'arrangement des paquets de spores), qui en diffère néanmoins par les spores et les asques plus grands ainsi que par l'excipulum légèrement pigmenté, en *textura intricata*. Néanmoins, la taille des asques, des spores et des paquets de spores mentionnés par Larsen (1970) sont très proches de celle des nôtres.

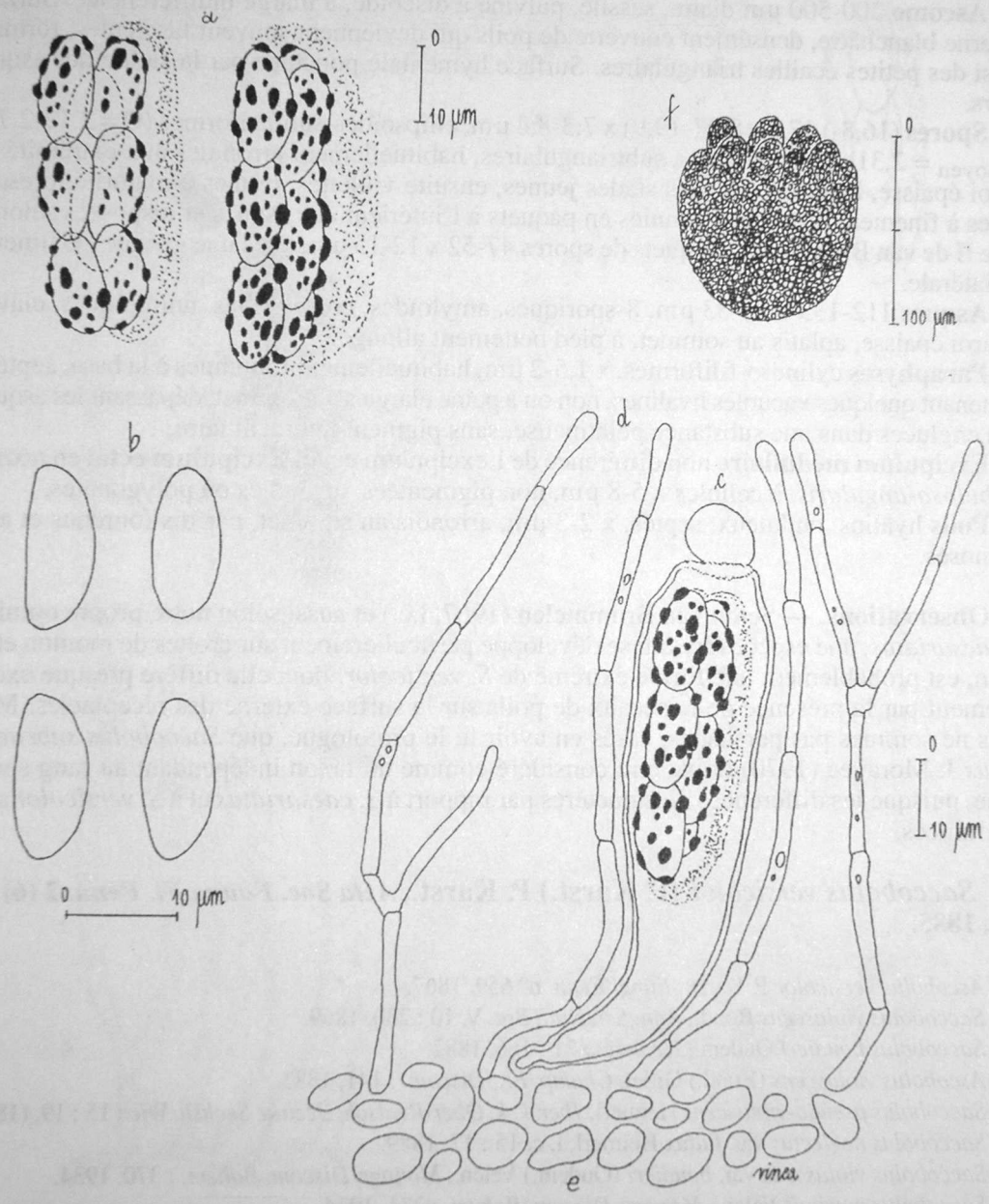


Fig. 18 — *Saccobolus aff. verrucisporus* : a = paquets de spores ; b = spores mûres sans pigment ; c = asque mûr avec spores ; d = paraphyses ; e = excipulum ; f = ascome.

Fig.18 (Saccobolus aff. verrucisporus): a = spore clusters ; b = ripe spores without pigment; c = ripe ascus with spores ; d = paraphyses ; e = excipulum ; f = ascoma.

de bovins (*Bos taurus*), *G. Medardi*, 5.96., 042.3-Madonna di Campiglio, MCVE 578. **2) Venezia,** Alberoni, 0 m, sur crotte de lapin (*Oryctolagus cuniculus*) en culture, E. Bizio, 5.97., 148.1.-Alberoni, CLSM 04696 bis. **3) Venezia,** Caroman, 0 m, sur crotte de lapin, en culture, *F. Doveri*, 5.97., 148.2.-Chioggia, CLSM 04696 ter. **4) Trento,** rifugio Panarotta, 1 800 m, sur bouse de vache, en culture, *A. De Vito*, 25.9.97, 060.120.-Frassilongo, CLSM 04696 quater. **5) Cosenza,** Orsomarso, 1 300 m, sur crottin d'âne (*Equus asinus*) en culture, C. Lavorato, 17.5.98., 533.2-Mormanno, CLSM 04696 penta. **6) Udine,** Monte Crostis, 2 000 m, sur bouse de vache en culture, *F. Bersan*, 26.6.98., 031.1.-Fontana Panzit, CLSM 04696 esa. **7) Cosenza,** Fossiata, 1 400 m, sur crotte de loup (*Canis lupus*) en culture,

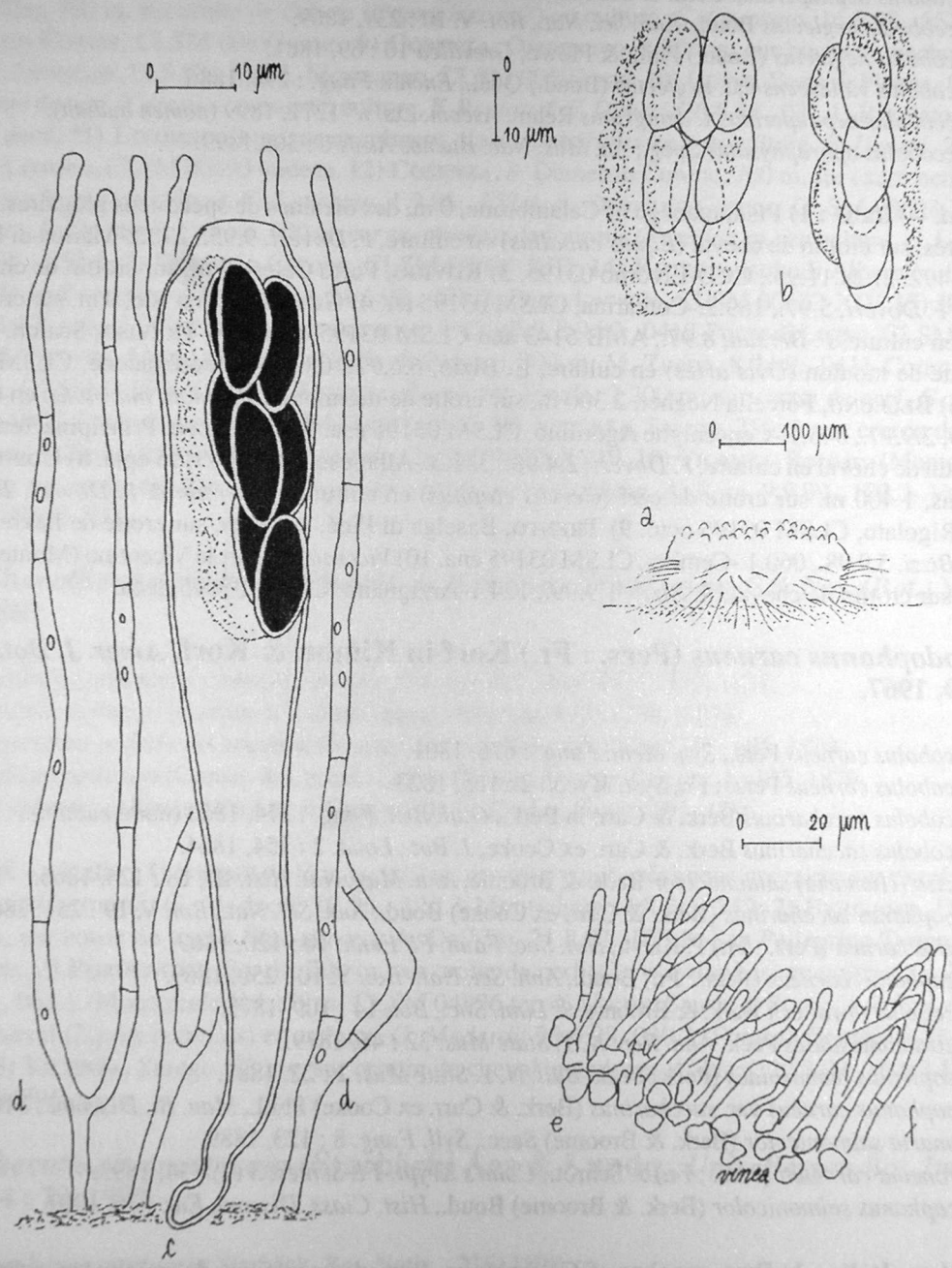


Fig. 19 — *Saccobolus caesariatus* : a = apothécie ; b = paquets de spores ; c = asque avec spores mûres ; d = paraphyses ; e = excipulum ectal ; f = poils.

Fig.19 (Saccobolus caesariatus): a = apothecium ; b = spore clusters ; c = ascus with ripe spores ; d = paraphyses ; e = ectal excipulum ; f = hairs.

nant au genre *Thecotheus* Boud. dont les spores possèdent les caractères énumérés ci-dessus mais aucune n'est complètement superposable à la nôtre. Par exemple, *T. africanus* Khan & Krug diffère par les spores plus petites (12-15 x 7,5-9 µm) et par la présence d'une collerette à la base de l'apicule (Krug & Khan, 1987). De plus, il a été trouvé sur excrément d'éléphant exclusivement. Les spores, décrites comme lisses à l'origine, montrent, selon Aas (1992), une fine ornementation granuleuse si on les observe au microscope optique sous fort grossissement. *T. perplexans* (Faurel & Schotter) Krug & Khan est une autre espèce possédant une collerette à la base des apicules, distincte également par les spores plus grandes (20-22 x 10-12 µm). Le matériel type en est pratiquement impossible à obtenir, de sorte qu'il est impossible d'en savoir plus sur la forme des spores,

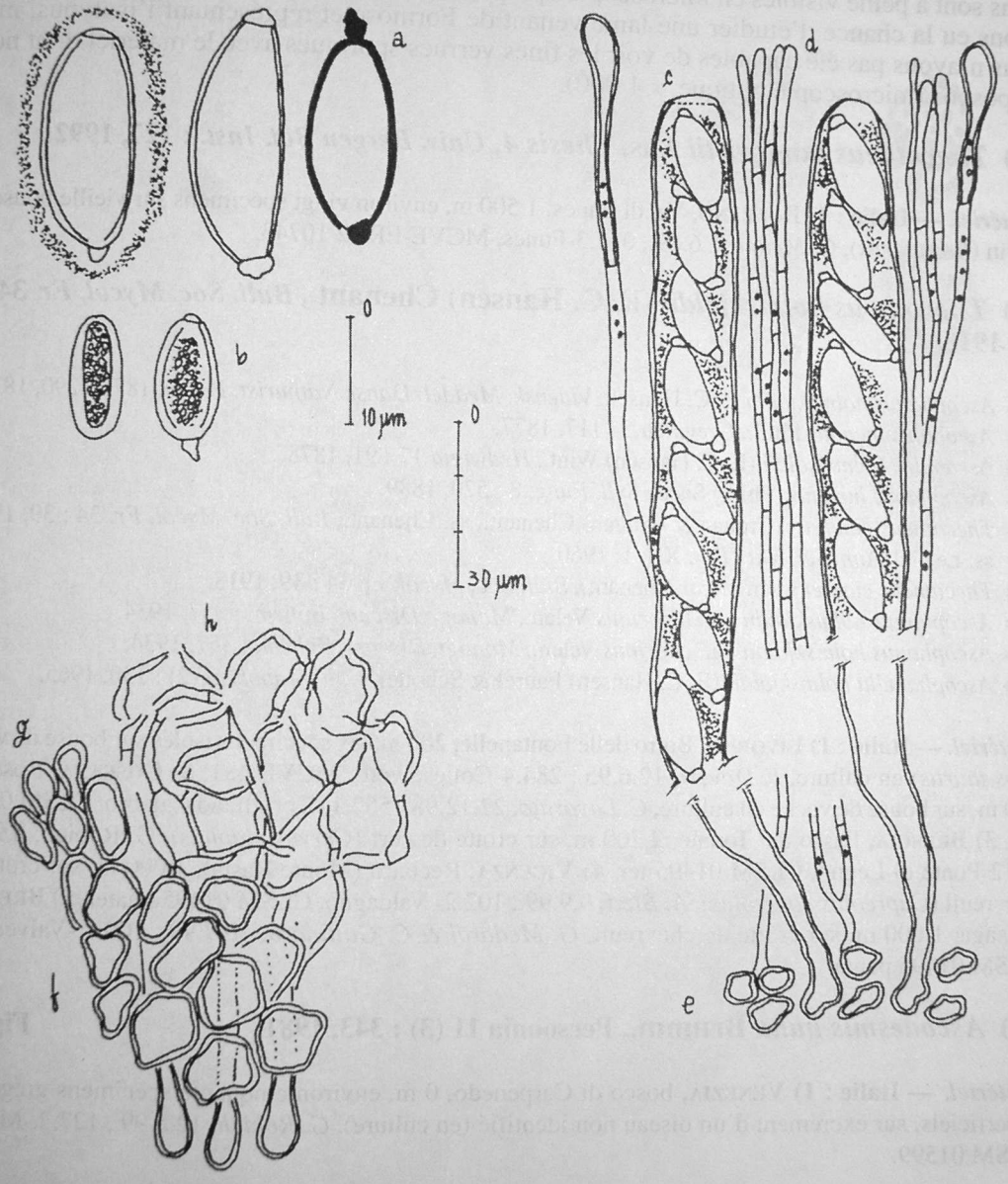


Fig. 20 — *Thecotheus formosanus* : a = spores mûres ; b = spores immatures ; c = asques ; d = paraphyses ; e = sous-hyménium ; f = excipulum ectal ; g = ectal excipulum à la marge ; h = excipulum médullaire.

Fig. 20 (Thecotheus formosanus): a= ripe spores; b= unripe spores; c= asci; d= paraphyses; e= subhymenium; f= ectal excipulum; g= ectal excipulum at the margin; h= medullary excipulum.

Spores irrégulièrement sériées ou agglomérées dans les asques, (8,9) 9,4-10,5 (11) x 8,6-10 µm (ornementation exclue), la plupart subglobuleuses mais aussi globuleuses et parfois largement ellipsoïdes (Q = 1,00-1,21 ; Q_{moyen} = 1,08), à paroi assez épaisse, spécialement dans les stades précoces, ensuite à paroi plus fine, à périspore facile à observer, contenant parfois une grande bulle de de Bary, d'abord hyalines, ensuite brunes, à ornementation cyanophile devenant brune à maturité et ne se colorant plus, alors, dans le bleu Coton. Ornementations sous forme de verrues rondes et de tubercules pointus ou aplatis (jamais élargis au sommet), jusqu'à 2 µm de haut et de large, isolés ou reliés pour former des crêtes courtes et simples ou au contraire parfois plus allongées et ramifiées.

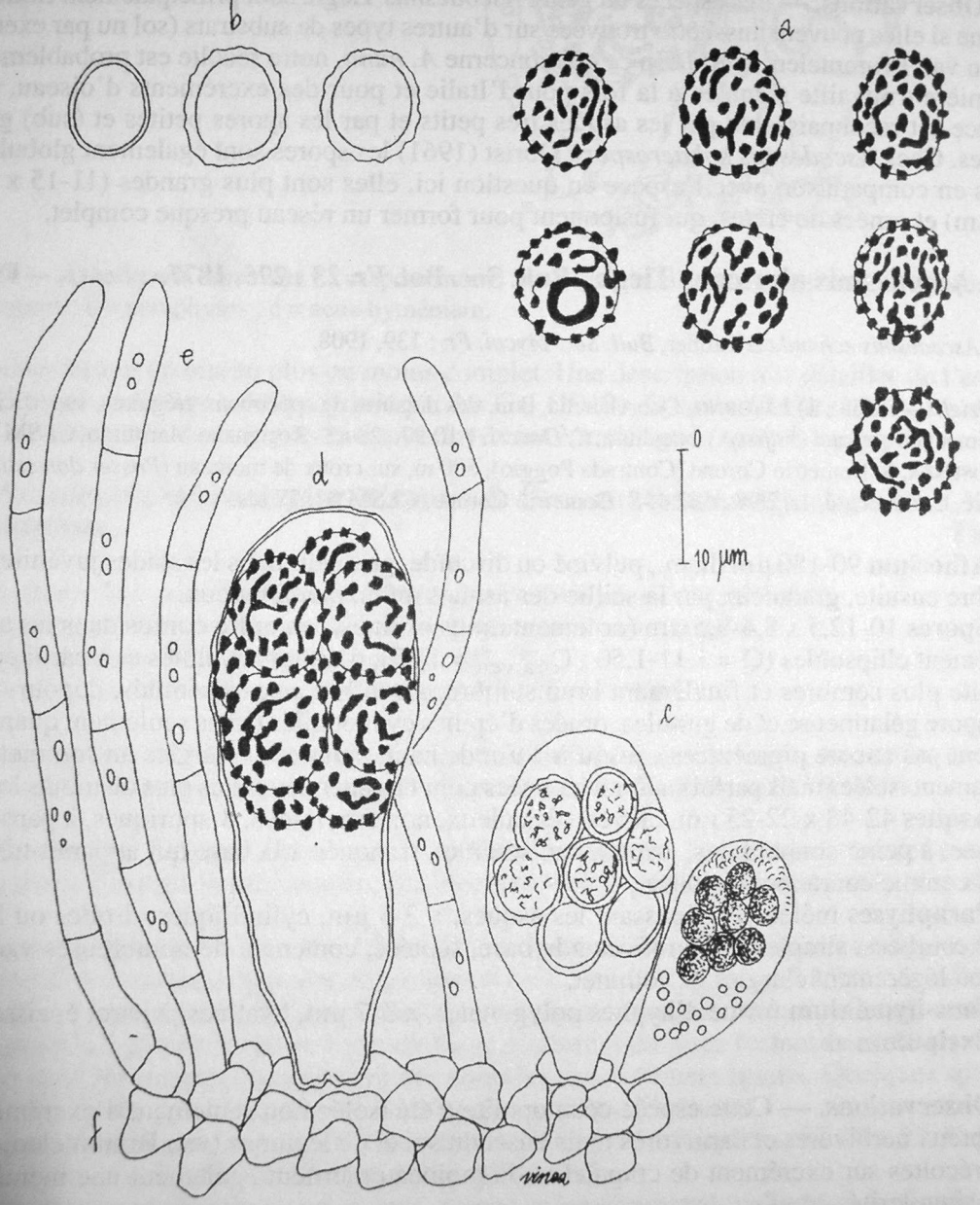


Fig. 21 — *Ascodesmis nana* : a = spores mûres (flèches = périspore) ; b = spores immatures ; c = asques immatures avec spores ; d = asque mûr avec spores ; e = paraphyses ; f = sous-hyménium.

Fig.21 (Ascodesmis nana): a = ripe spores (arrows = perisporium); b = unripe spores ; c = unripe asci with spores ; d = ripe ascus and spores ; e = paraphyses ; f = subhymenium.

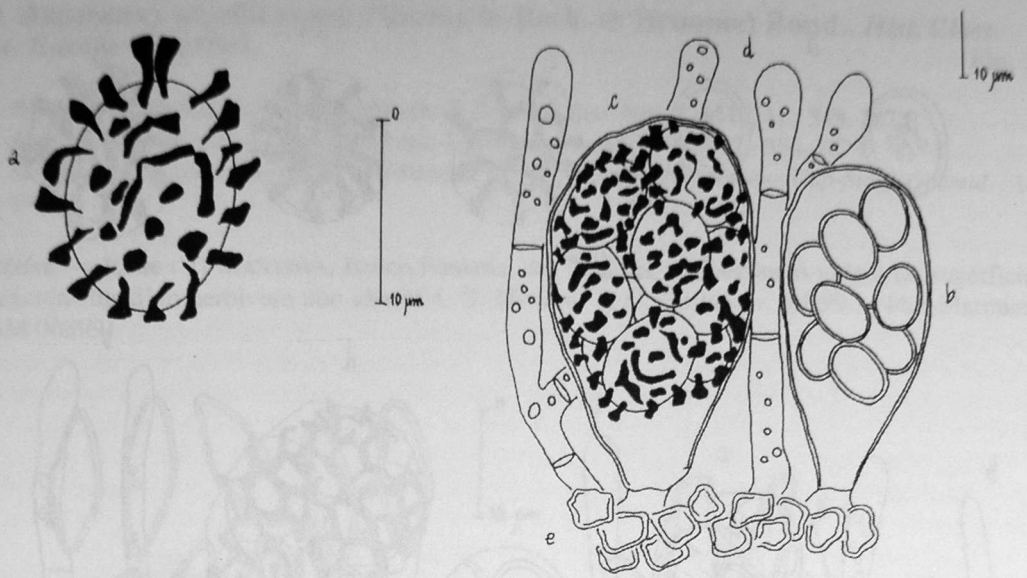


Fig. 22 — *Ascodesmis nigricans* : a = spore mûre ; b = asque immature avec spores ; c = asque mûr avec spores ; d = paraphyses ; e = sous-hyménium.

nées pour former un réseau plus ou moins complet. Une description très détaillée de l'espèce dont il est ici question a été proposée par Le Gal (1949). D'après Obrist (1961), les spécimens étudiés par la mycologue française devraient être désignés comme neotypus.

51) *Ascodesmis microscopica* (Crouan & Crouan) Seaver, *Mycologia* 8 : 3, 1916 (mal appliqué) Fig. 23

≡ *Ascobolus microscopicus* Crouan & Crouan, *Ann. Sci. Nat., Bot.* IV, 7 : 175, 1857.
≡ *Boudiera microscopica* (Crouan & Crouan) Cooke, *Grevillea* 6 : 76, 1877.
= *Boudiera claussenii* P. Henn., *Hedwigia* 42 : 182, 1903.
= *Ascodesmis reticulata* Bainier, *Bull. Soc. Mycol. Fr.* 23 : 137, 1908.

***Matériel.* — Italie : 1) MODENA,** Zocca, 750 m, des dizaines de spécimens grégaires, superficiels, sur crotte de hérisson (*Erinaceus europaeus*) en culture, L. Piccioli, 12.99., 237.4-Savigno, CLSM 02899.

Athecium 80-150 µm diam., sessile, pulviné à discoïde, blanchâtre avec des tonalités grises, lisse, à marge indifférenciée. Surface hyméniale ponctuée par la saillie des asques mûrs.

Spores (11,8-) 12,3-13,3 x 9,5-10,4 µm (ornementation exclue), bisériées à agglomérées à l'intérieur des asques, largement ellipsoïdes (Q = 1,22-1,35 ; Q_{moyen} = 1,25), arrondies aux extrémités, à paroi épaisse, hyalines dans les stades précoces puis brun très foncé, ornées de crêtes jusqu'à 1 µm de large et 3 µm de haut, se réunissant pour former un réseau presque complet dont les intersections portent des spinules aux sommets aplatis. Quelques spinules isolées sont également présentes à l'intérieur des mailles du réseau.

Asques 8-sporiques, non amyloïdes, unituniqués, clavé-vésiculeux, 57-70 x 23-31 µm, à paroi onduleuse et à pied très court, à peine différencié.

Paraphyses nombreuses, mêlées aux asques et les dépassant, cylindriques, septés (1 ou 2 cloisons), simples ou ramifiés à la base, x 2-3,5 µm, élargies au sommet jusqu'à 5 µm, contenant un pigment vacuolaire jaunâtre pâle.

Fig.22 (Ascodesmis nigricans): a= ripe spore; b= unripe ascus and spores; c= ripe ascus and spores; d= paraphyses; e= subhymenium.

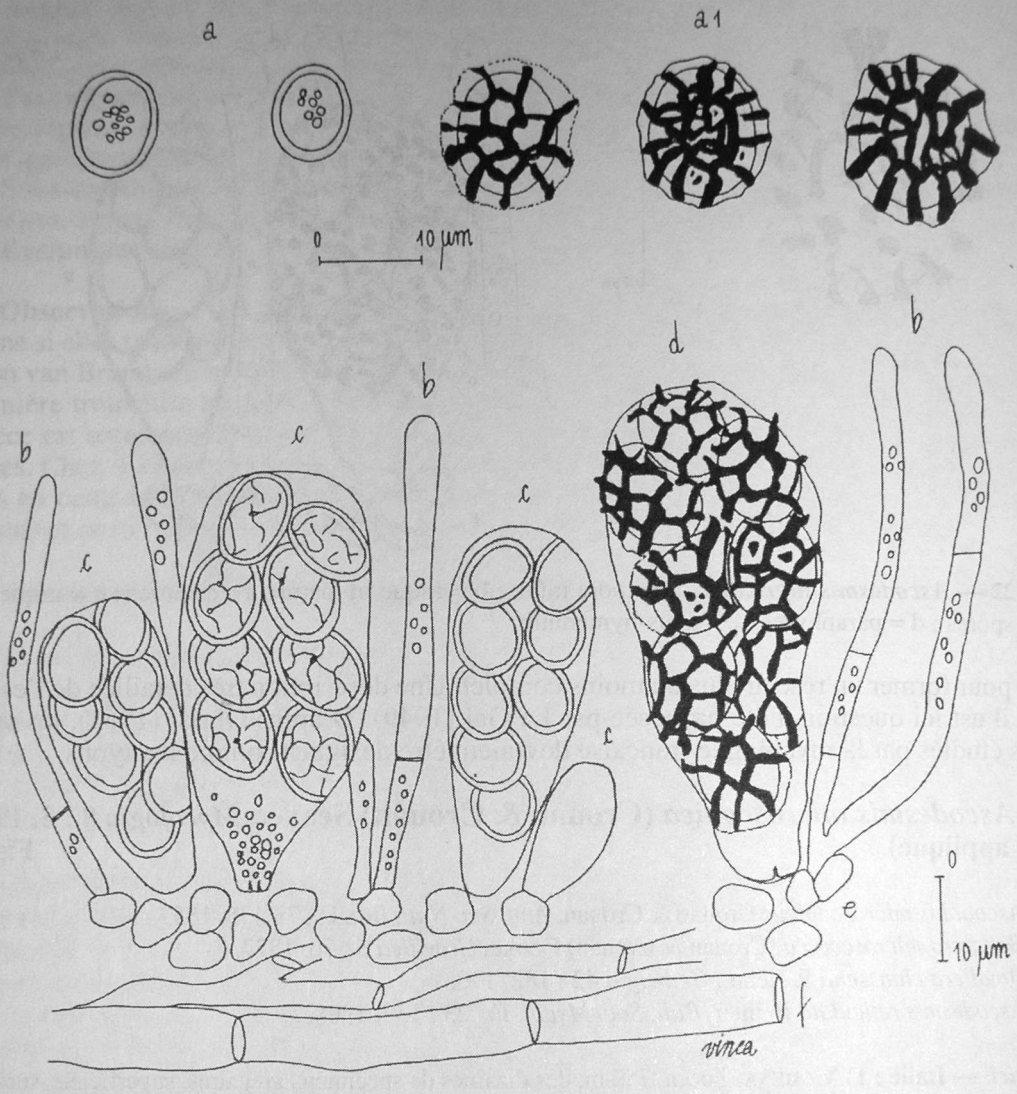


Fig. 23 — *Ascodesmis microscopica* : a = spores immatures ; a1 = spores mûres ; b = paraphyses ; c = asques immatures ; d = asque mûr ; e = sous-hyménium ; hyphes basales.

Sous-hyménium formé de cellules arrondies ou polygonales, jusqu'à x 4-7 µm.
Excipulum absent, remplacé par des hyphes larges (x 7-10 µm), congophiles, septées, hyalines, à paroi fine.

Observations. — Cette espèce cosmopolite se développe sur les excréments de plusieurs herbivores ou omnivores. Néanmoins, notre récolte est la première sur excréments de hérisson.

Comme van Brummelen (1981, l.c.) l'a déjà signalé, ce taxon a souvent été mal interprété par le passé, par exemple par Seaver (1916) lui-même. L'auteur américain a en fait valide-ment recombiné *Ascobolus microscopicus*, décrit par Crouan & Crouan (1857), dans le genre *Ascodesmis*, mais l'a confondu avec *Ascodesmis sphaerospora* Obrist, une espèce à spores réticulées mais plus globuleuses qu'ellipsoïdes.

Fig.23 (Ascodesmis microscopica): a = unripe spores ; a1 = ripe spores ; b = paraphyses ; c = unripe asci ; d = ripe ascus ; e = subhymenium ; basal hyphae.

52) *Ascozonus woolhopensis* (Renny in Berk. & Broome) Boud., *Hist. Class. Disc. Europe* : 79, 1907. **Fig. 24**

≡ *Ryparobius woolhopensis* Renny *in* Berk. & Broome, *Ann. Nat. Hist.* IV, 11 : 348, 1873.
≡ *Ascobolus woolhopensis* (Renny *in* Berk. & Broome) Renny, *J. Bot.* 12 : 356, 1874.
≡ *Streptotheca woolhopensis* (Renny *in* Berk. & Broome) Seaver, *North Amer. Cup-fungi, Opercul. :* 143, 1928.

***Matériel.* — Italie : 1) MANTOVA,** Bosco Fontana, des dizaines de spécimens grégaires, superficiels, sur excréments d'un herbivore non identifié, *G. Medardi & C. Gallinaro*, 3.1.99., 144.3-Marmirolo, CLSM 00399.

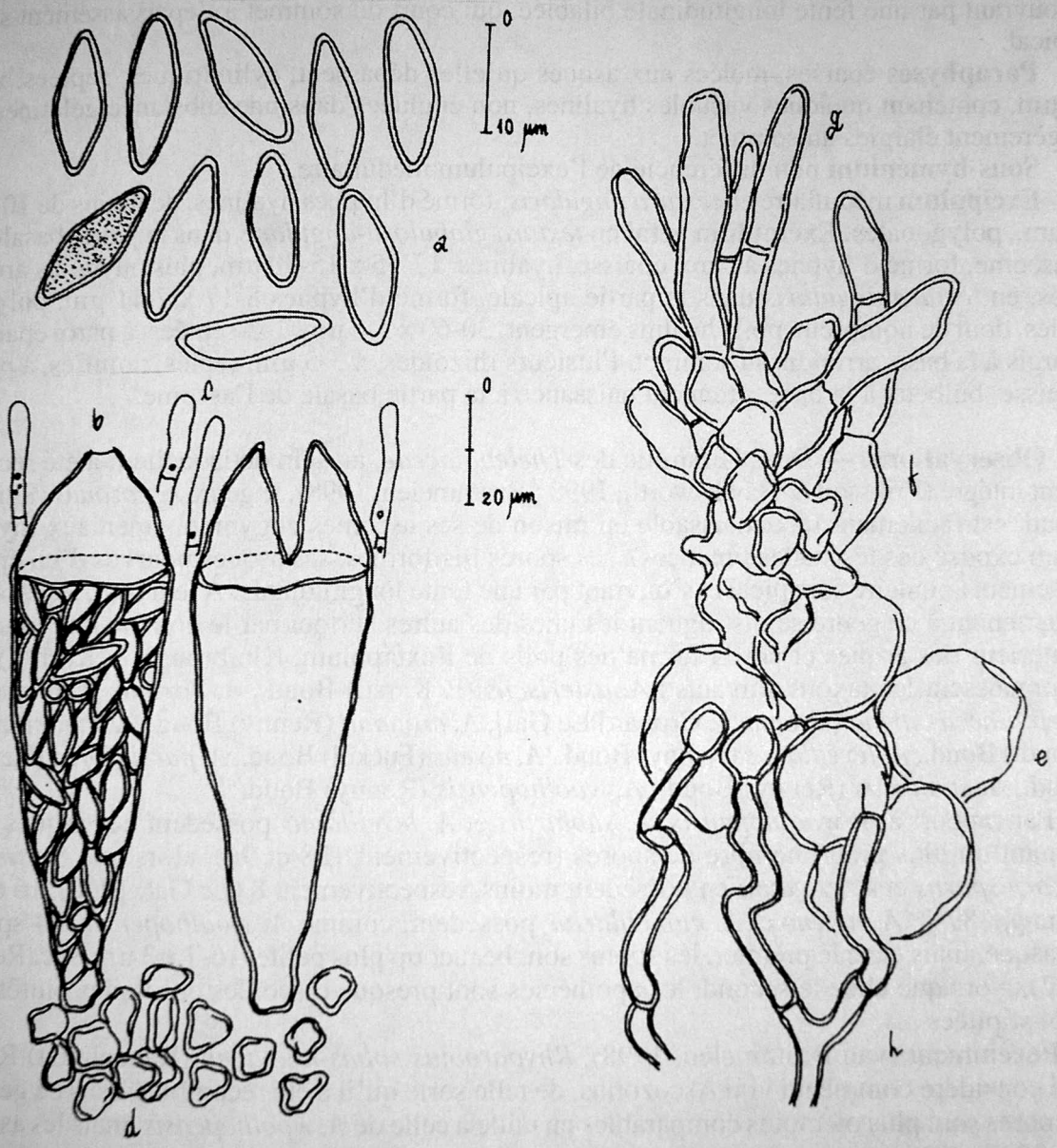


Fig. 24 — *Ascozonus woolhopensis* : a = spores ; b = asques ; c = paraphyses ; d = sous-hyménium et excipulum médullaire ; e = excipulum ectal dans la partie inférieure de réceptacle ; f = excipulum ectal à la partie supérieure du réceptacle ; g = poils ; h = rhizoïdes.

Fig. 24 (Ascozonus woolhopensis): a= spores; b= asci; c= paraphyses; d= subhymenium and medullary excipulum; e= ectal excipulum on the lower part of the receptacle; f= ectal excipulum on the higher part of the receptacle; g= hairs; h= rhizoids.

jusqu'ici étiquetées comme « aff. *luteus* », en ayant évidemment à élargir la gamme de variation des tailles sporales (longueur jusqu'à 12 µm plutôt que seulement 10 µm).

55) *Coprotus* aff. *luteus* Kimbr., Luck-Allen & Cain, *Can. J. Bot.* 50 : 966, 1972.

Matériel. — **Italie : 1) Livorno,** Botro delle Fontanelle, 200 m, des dizaines de spécimens grégaires, superficiels sur bouse de bovin (*Bos taurus*) en culture, *F. Doveri,* 10.6.95., 284.4.-Collesalvetti, MCVE 477. **2) Gorizia,** Isola della Cona, 0 m, sur crottin de cheval (*Equus caballus*) en culture, *K. Kravos,* 3.11.97., 109.131.-Monfalcone, CLSM 01595 ter. **3) Cosenza,** Rossano, 700 m, sur bouse de vache en culture, *C. Lavorato,* 22.12.98., 552.1.-Corigliano Calabro, CLSM 01595 quater.

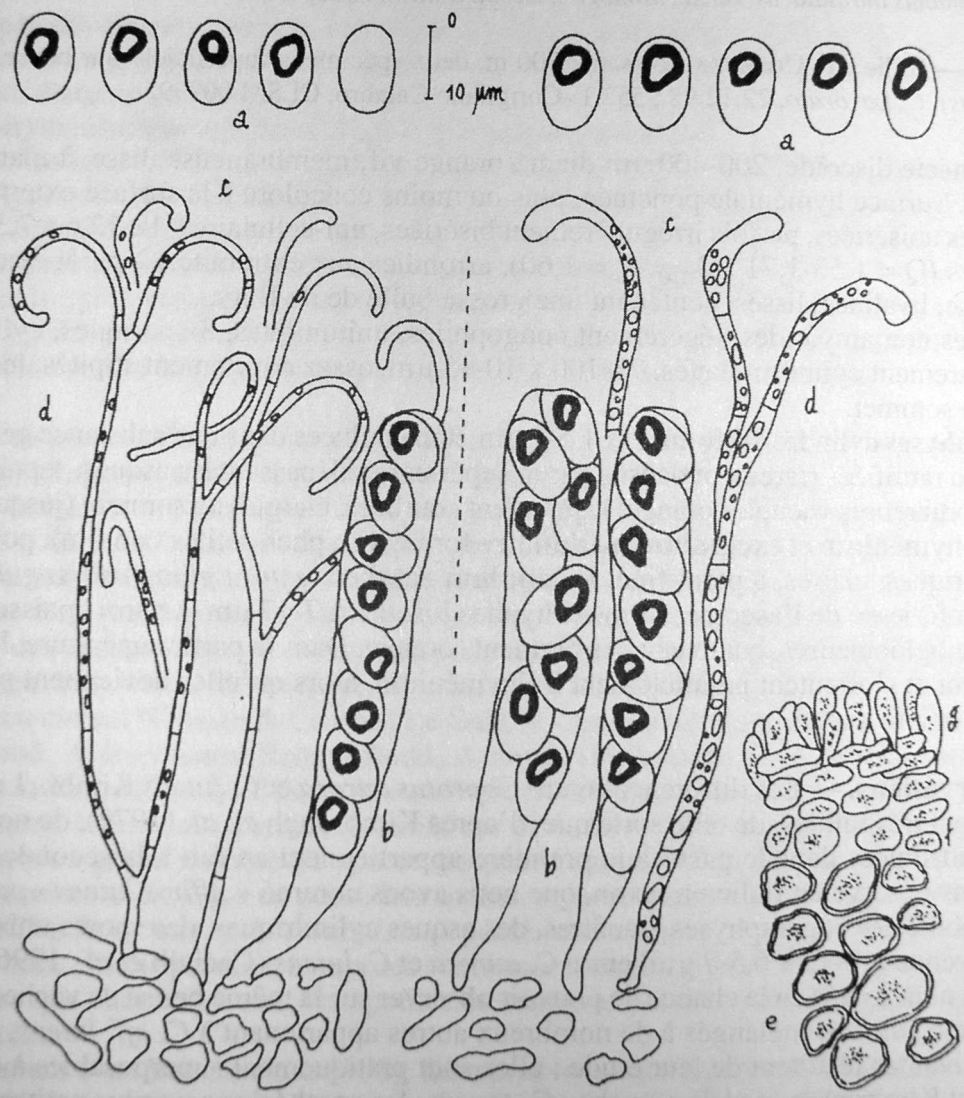


Fig. 25 — *Coprotus aurora* [et ***C. aff. luteus***] : a = spores ; b = asques avec spores mûres [les dessins situés à gauche du trait pointillé correspondent à C. aff. luteus] ; c = paraphyses ; d = sous-hyménium et excipulum médullaire ; e = excipulum ectal dans la partie inférieure de l'ascome ; f = excipulum ectal dans la partie supérieure de l'ascome ; g = excipulum ectal à la marge.

Fig. 25 (Coprotus aurora): a= spores; b= asci with ripe spores; c= paraphyses; d= subhymenium and medullary excipulum; e= ectal excipulum in the lower part of the ascoma; f= ectal excipulum in the upper part of the ascoma; g= ectal excipulum at the margin.

56) *Coprotus subcylindrosporus* J. Moravec, *Ceská Mykol.* 25 (3) : 155, 1971.
Fig. 26

***Matériel.* — Italie : 1) UDINE,** Sauris di Sopra, 1 400 m, quatre spécimens grégaires, sur crottin de cheval (*Equus caballus*) en culture, *G. Medardi*, 25.6.98., 030.2.-Forni di Sopra, CLSM 04698.

Apothécie 350-450 µm diam., 120-150 µm de haut, obconique, devenant pulvinée ou presque discoïde, jaune clair, membraneuse, lisse, à marge différenciée ou non. Surface hyméniale légèrement convexe ou plate, granuleuse par la saillie des asques mûrs.

Spores (14,1-) 14,7-17,3 x 8,4-8,9 µm, subcylindriques, arrondies aux extrémités (Q = 1,70-2,06 ; Q_{moyen} = 1,87), souvent subphaséoliformes, parfois étroitement ellipsoïdes, irrégulièrement unisériées mais aussi bisériées, lisses, hyalines, dépourvues de guttules huileuses et de périspore gélatineuse mais pourvues d'une grande bulle de de Bary, à paroi épaisse dans la jeunesse et contenant une substance granuleuse jaune.

Asques 84-100 x 15-19 µm, cylindriques ou cylindro-clavés, non amyloïdes, congophiles, 8-sporiques, operculés, légèrement rétrécis et aplatis au sommet, a pied court et lobé.

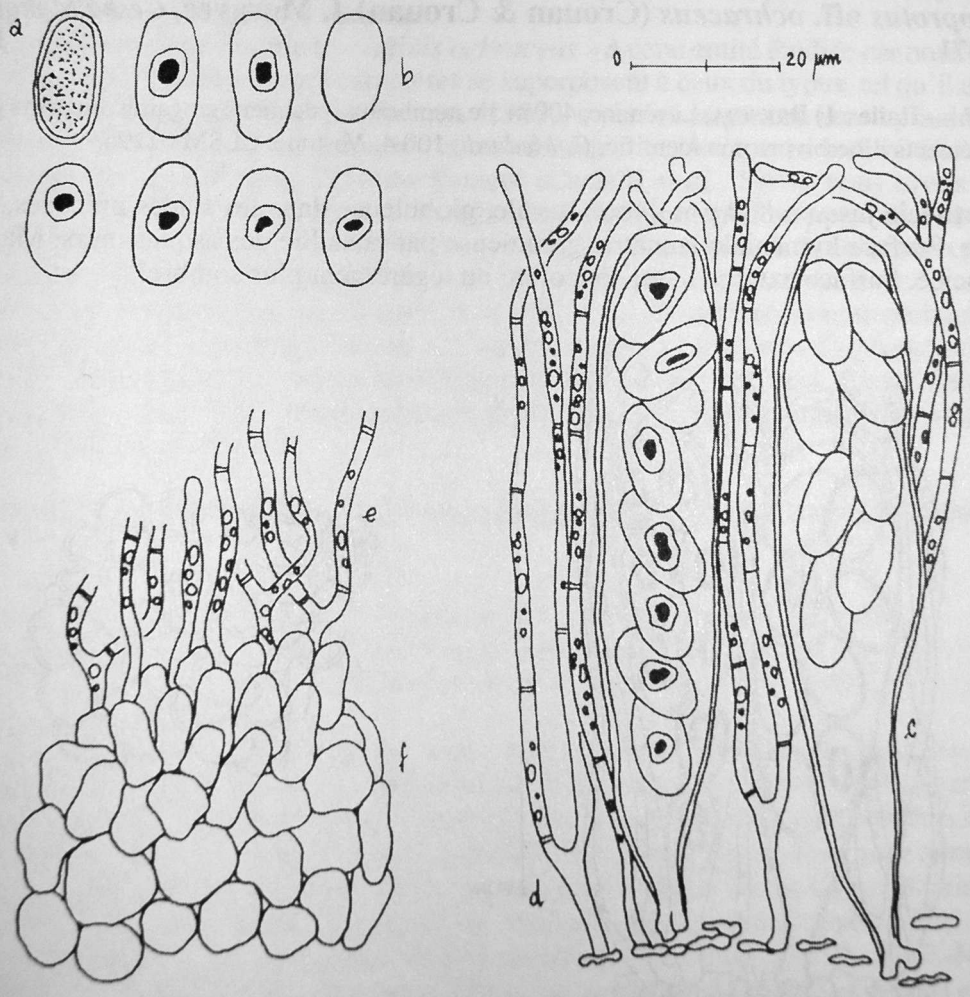
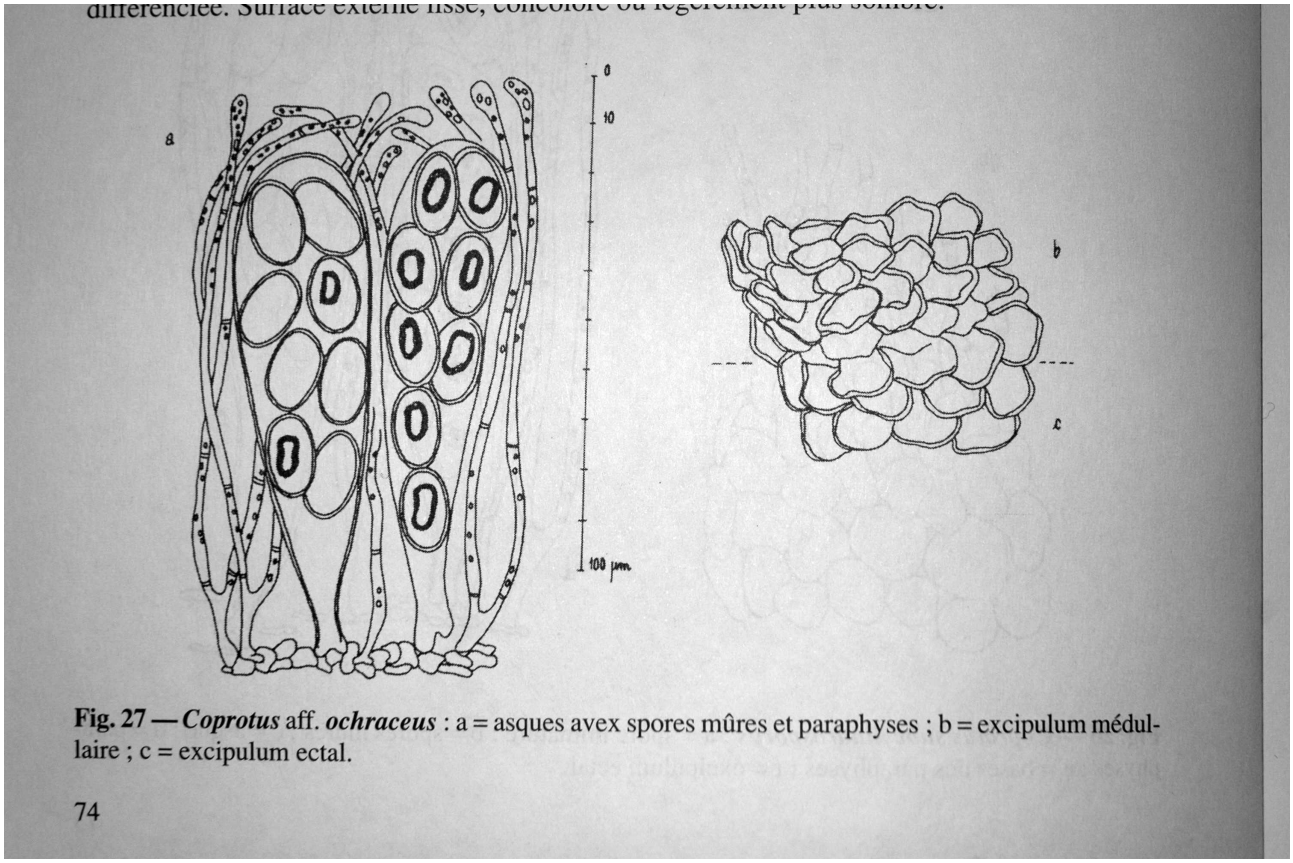


Fig. 26 — Coprotus subcylindrosporus : a = spore immature ; b = spores mûres ; c = asque ; d = paraphyses ; e = bases des paraphyses ; f = excipulum ectal.

Fig.26 (Coprotus subcylindrosporus): a= unripe spore; b= ripe spores; c= ascus; d= paraphyses; e= bases of the paraphyses; f= ectal excipulum.



différenciée. Surface externe lisse, concolore ou légèrement plus sombre.

Fig. 27 — *Coprotus* aff. *ochraceus* : a = asques avex spores mûres et paraphyses ; b = excipulum médullaire ; c = excipulum ectal.

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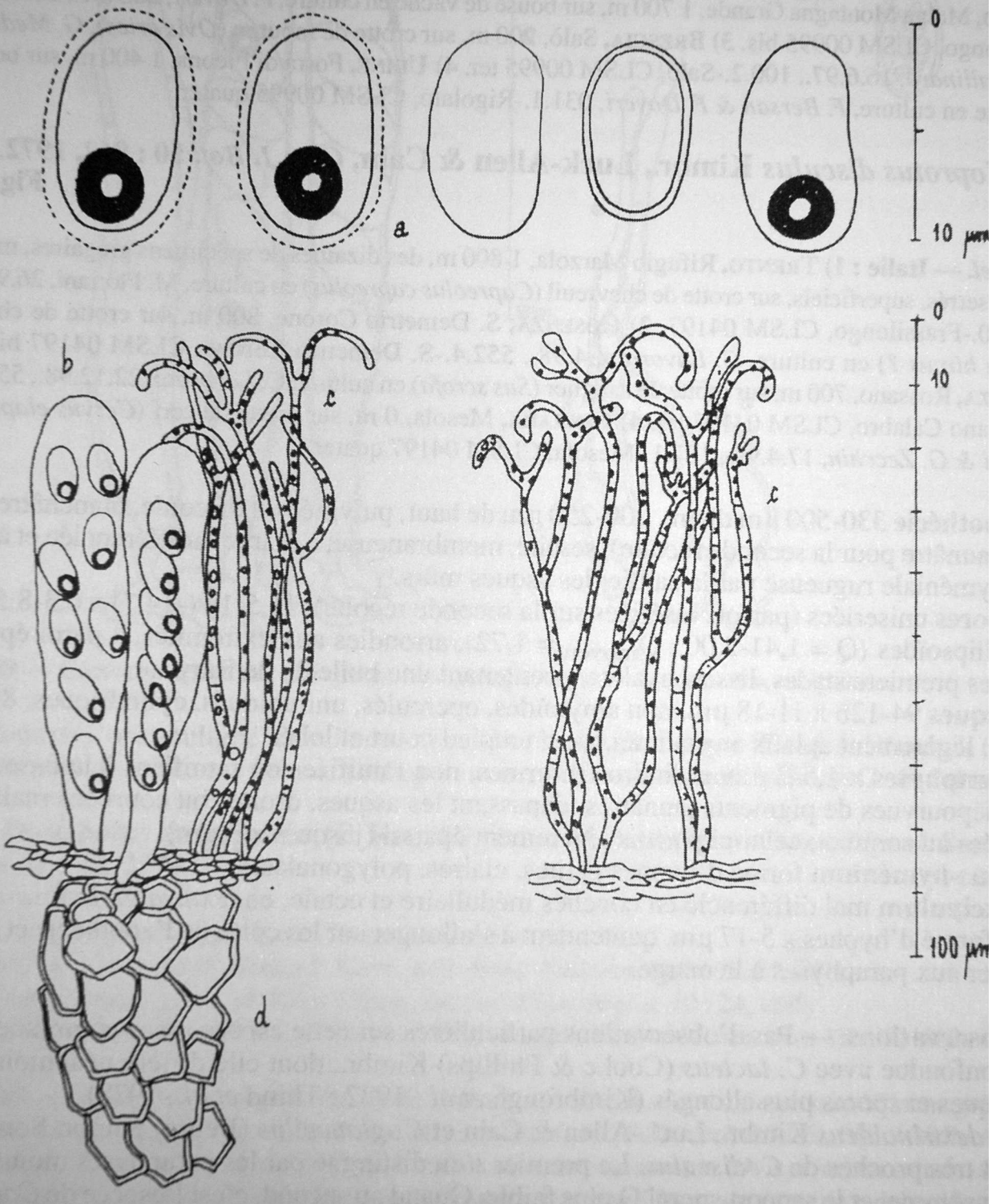
Fig.27 (Coprotus aff. ochraceus): a= asci with ripe spores and paraphyses; b= medullary excipulum; c= ectal excipulum.

60) *Coprotus leucopocillum* Kimbr., Luck-Allen & Cain, *Can. J. Bot.* 50 : 1972.

***Matériel.* — Italie : 1) PISA,** Calambrone, 0 m, des dizaines de spécimens grégaires sur crottin val (*Equus caballus*) en culture, *F. Doveri,* 1.96., 272.2.-Marina di Pisa, MCVE 550.



. 28 — *Coprotus glaucellus* : a = spores ; b = asques ; c = paraphyses ; d = excipulum.

Fig.28 (Coprotus glaucellus): a= spores; b= asci; c= paraphyses; d= excipulum.

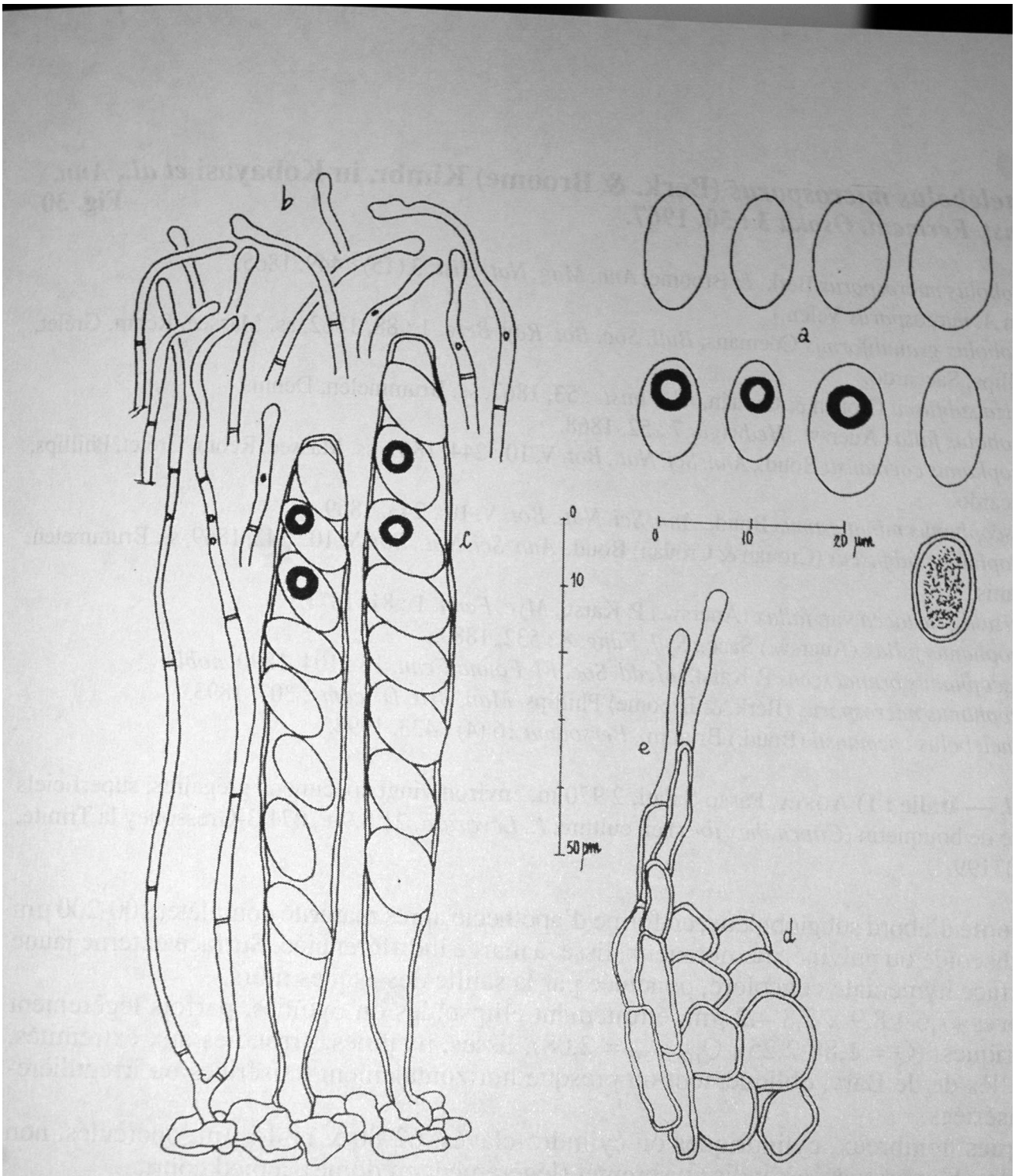


Fig. 29 — *Coprotus disculus* : a = spores ; b = paraphyses ; c = asques ; d = excipulum.

Comme l'ont souligné Thind *et al.* (l.c.), la récolte décrite par Thind & Waraitch sous le nom *Ascophanus lacteus* (= *Coprotus lacteus*) correspond en fait à C. disculu

63) *Thelebolus polysporus* (P. Karst.) Otani & Kanzawa, *Trans. Mycol. So Japan* 11 : 45, 1970.

≡ *Ascobolus polysporus* P. Karst., *Fungi Fenn. exs.* n° 656, 1867.
≡ *Pezizula polyspora* (P. Karst.) P. Karst., *Bidr. Känn. Finl. Nat. Folk.* 19 : 82, 1871.

Fig.29 (Coprotus disculus): a= spores; b= paraphyses; c= asci; d= excipulum.

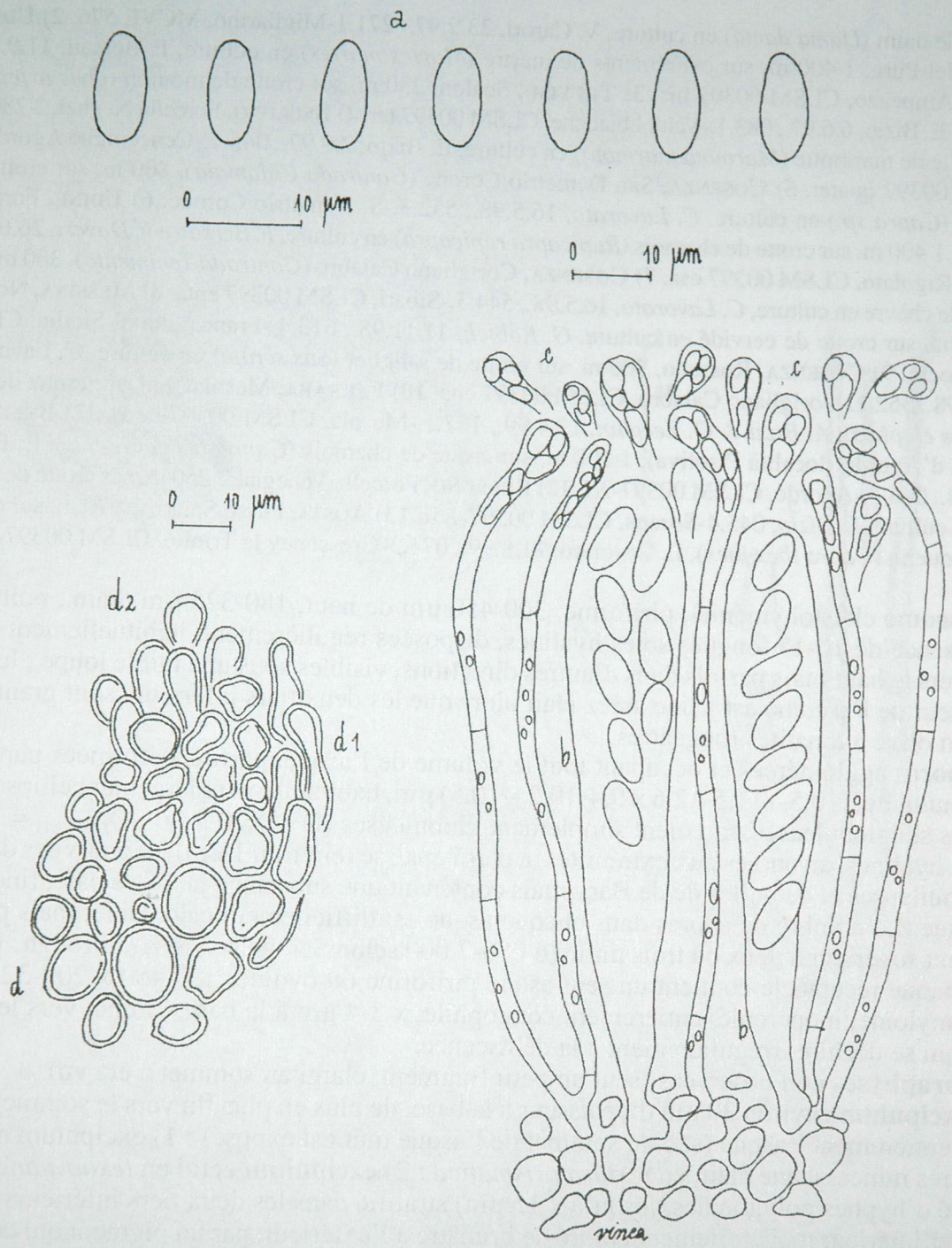


Fig. 30 — *Thelebolus microsporus* : a = spores ; b = asques ; c = paraphyses ; d = excipulum (d1 = sur les parois de l'apothécie ; d2 = à la marge).

65) *Trichobolus zukalii* (Heimerl) Kimbr., *Amer. J. Bot.* 54 : 21, 1967.

Fig. 31 ; Pl. 2-b

≡ *Thelebolus zukalii* Heimerl, *Jahr. k. k. Ober-Realsch. Bezirke Sechshaus, Wien* 15 : 30, 1889.

***Matériel* — Italie : 1) Pisa, S. Rossore natural park, 0 m, des dizaines de spécimens dissémi-**

Fig.30 (Thelebolus microsporus): a = spores ; b = asci ; c = paraphyses ; d = excipulum (d1 = on the flanks of receptacle ; d2 = at the margin).

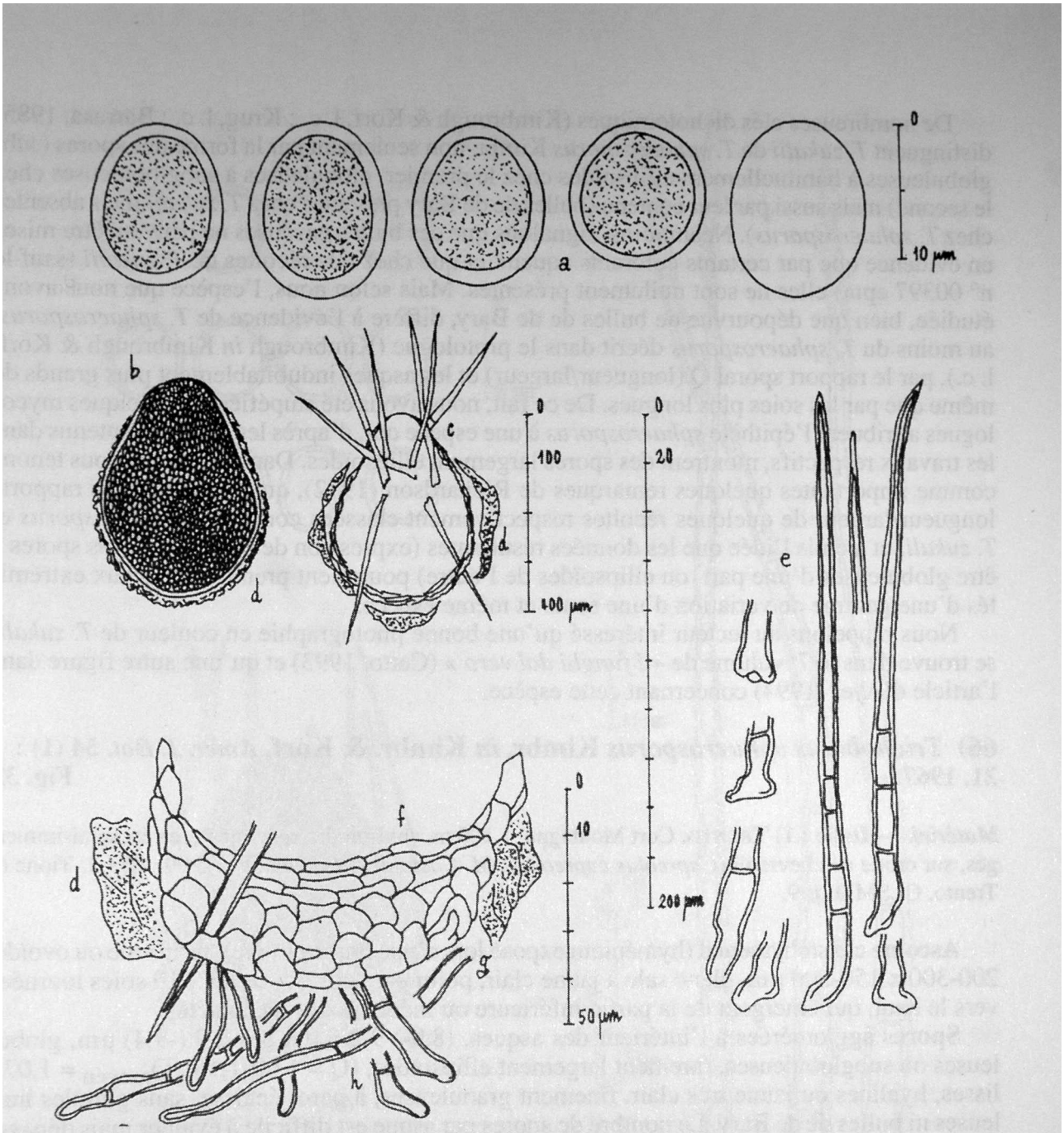


Fig. 31 — ***Trichobolus zukalii*** : a = spores ; b = asque ; c = réceptacle ; d = pigment granuleux ; e = soies ; f = excipulum médullaire ; g = excipulum ectal ; h = rhizoïdes.

Khan & Bezerra (in Bezerra & Kimbrough, 1975) possèdent des soies portant une ou deux cloisons basales aux côtés de soies non septées. Le premier de ces deux taxons possède, comme *T. zukalii,* des réceptacles pourvus d'un seul asque, mais il s'en distingue par les spores plus petites et la base bulbeuse des soies (Kimbrough, l. c. ; van Brummelen, 1984), alors que le second porte de nombreux asques 8-sporiques et se distingue par l'apothécie cupulée et l'arrangement vertical des hyphes de l'excipulum ectal (Bezerra & Kimbrough, l. c.).

T. zukalii pousse habituellement sur crotte de cerf (Saccardo, 1892 ; Tóth, 1963, 1965 ; Kimbrough 1966a, 1966b ; Ellis & Ellis, 1988), de même que de nombreux autres *Trichobolus,* dont *T. octosporus* Krug. La description très récente de cette entité, pourvue de nombreux asques (25-40 par réceptacle) 8-sporiques, implique une émendation (Krug, 1973) du genre auquel elle appartient [en fait, *Trichobolus* ne renfermait initialement que des espèces portant peu d'asques (1-3) polysporiques].

Fig.31 (Trichobolus zukalii): a= spores; b= ascus; c= receptacle; d= granular pigment; e= setae; f= medullary excipulum; g= ectal excipulum; h= rhizoids.

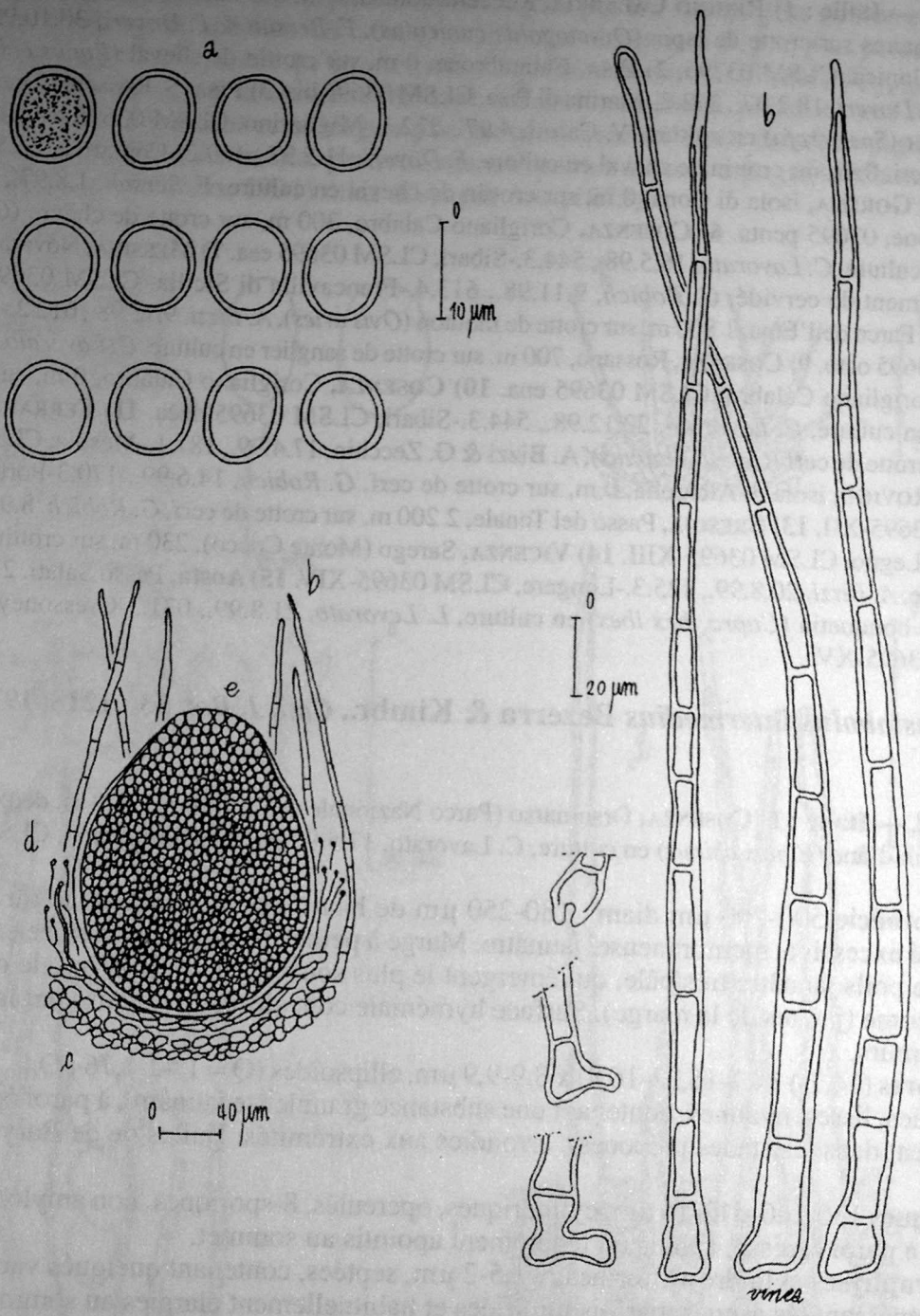


Fig. 32 — *Trichobolus sphaerosporus* : a = spores ; b = soies ; c = excipulum ; d = paraphyses ; e = asque avec spores.

globuleuses et tendant à être plus petites ainsi que de soies habituellement plus courtes (Richardson & Watling, 1997).

67) *Lasiobolus cuniculi* Velen., *Monogr. Discom. Bohem.* 1 : 363, 1934.

= *Lasiobolus brachytrichus* Velen., *Monogr. Discom. Bohem.* 1 : 362-363, 1934.
= *Lasiobolus leporinus* Velen., *Monogr. Discom. Bohem.* 1 : 413, 1934.

Fig.32 (Trichobolus sphaerosporus): a = spores ; b = setae ; c = excipulum ; d = paraphyses ; e = ascus with spores.

principales, de *L. ciliatus*, mais il peut s'en distinguer par les spores plus petites et toujours unisériées. D'autre part, il diffère de *L. macrotrichus* par les spores un peu plus petites et ellipsoïdes (Q_{moyen} = 1,60) plutôt qu'étroitement ellipsoïdes ou subfusiformes (Q_{moyen} > 2,0). Nous supposons que c'est une espèce très rare, au moins en Italie, puisque nous ne l'avons observée qu'une fois durant cette longue période consacrée à l'étude des champignons fimicoles. En Europe, elle a été décrite particulièrement par les auteurs espagnols (Guarro, 1983 ; Barrasa, 1985 ; Valldosera, 1991) mais aussi par Aas (1978).

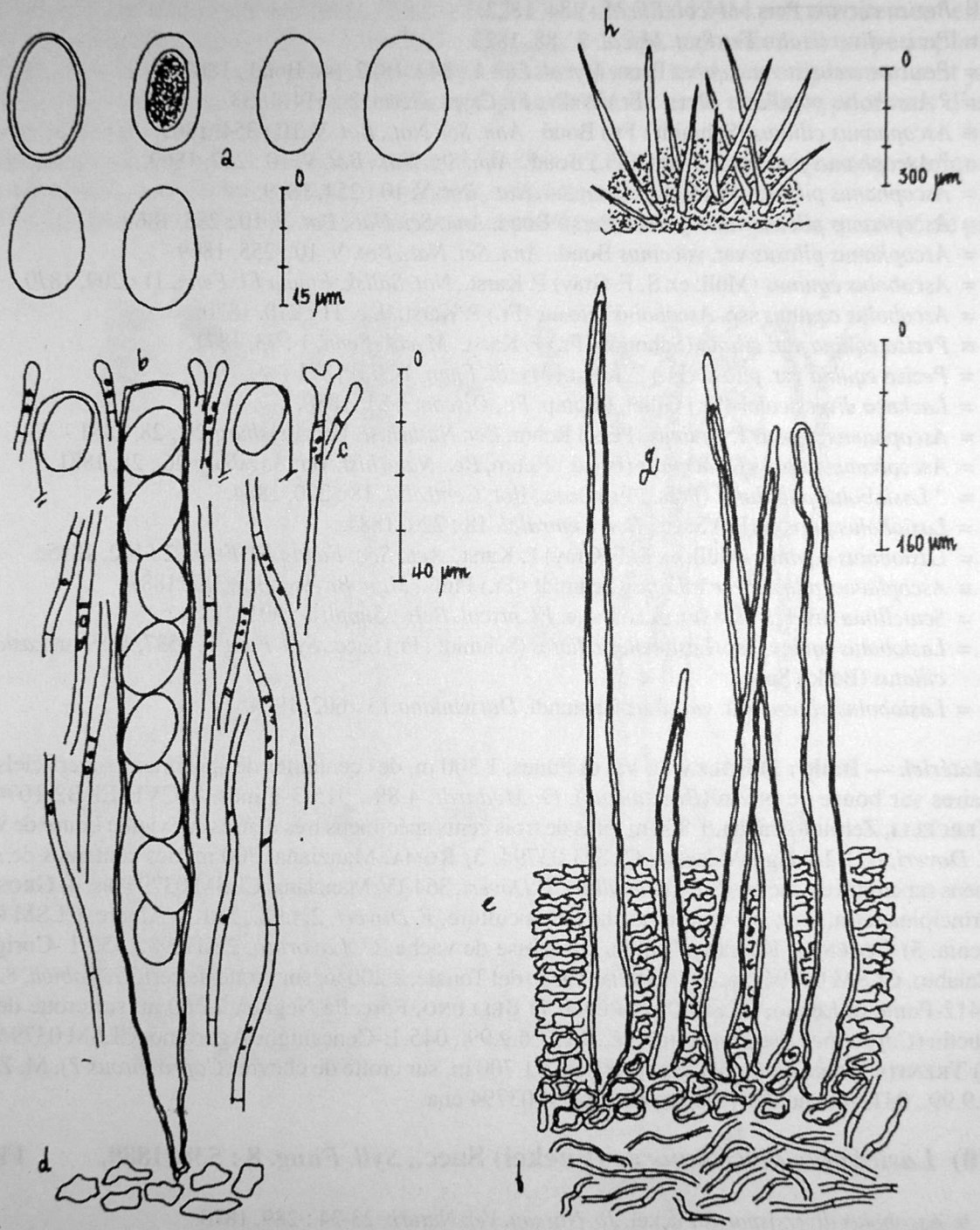


Fig. 33 — *Lasiobolus intermedius* : a = spores ; b = asque ; c = paraphyses ; d = excipulum médullaire ; e = excipulum ectal ; f = rhizoïdes ; g = soies ; h = ascome.

Fig.33 (Lasiobolus intermedius): a= spores; b= ascus; c= paraphyses; d= medullary excipulum; e= ectal excipulum; f= rhizoids; g= setae; h= ascoma.

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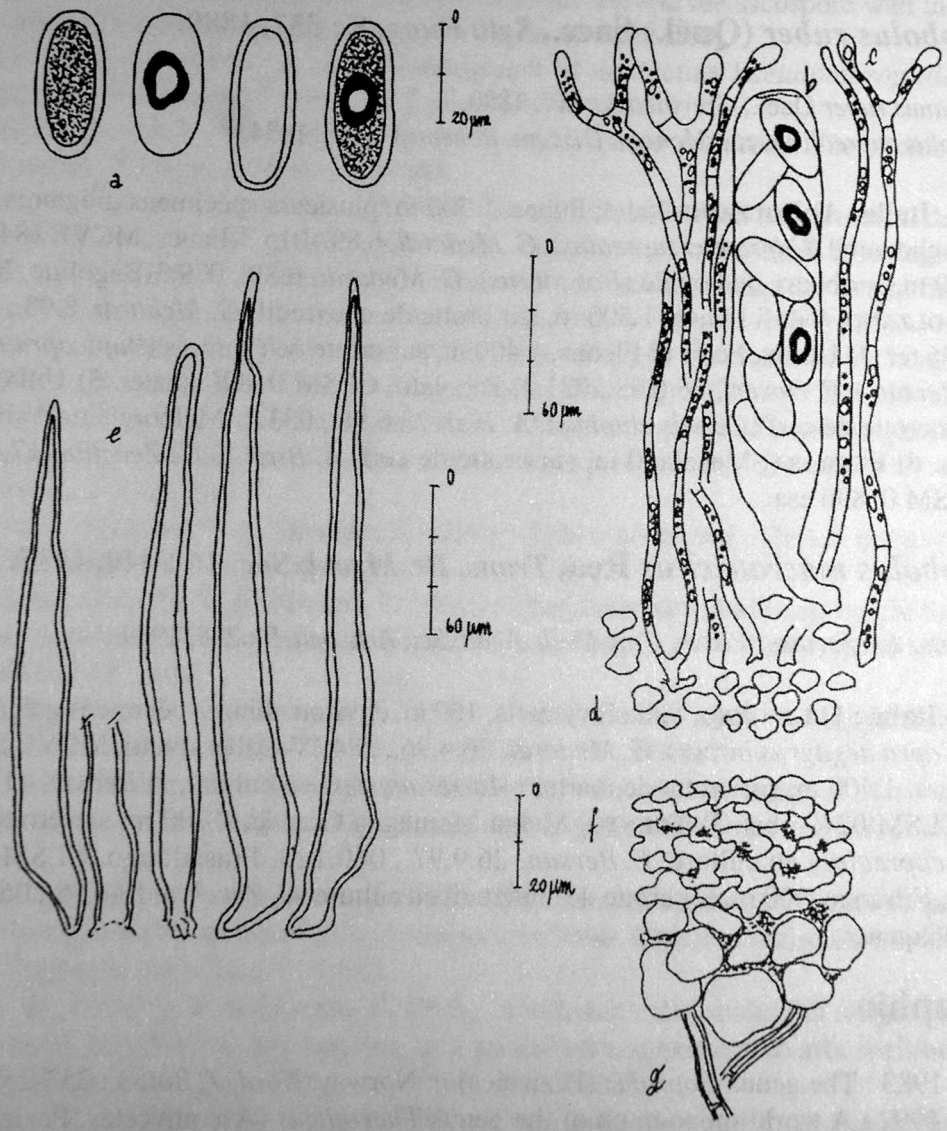
Apothécie 340-500 µm diam., 200-250 µm de haut, d'abord globuleuse, ensuite cupulée, ndant à s'aplatir légèrement à maturité, membraneuse, orange vif, avec la surface externe uverte de poils courts, hyalins, assez denses. Marge assez mal différenciée, non poilue. rface hyméniale concolore, ponctuée.

Spores habituellement bisériées, (25,2-) 28,3-32,5 (-36,2) x 12-14 µm, étroitement ellipïdales à subcylindriques (Q = 1,84-2,87 ; Q_{moyen} = 2,31), arrondies ou un peu aplaties mais apointies) aux extrémités, à paroi très épaisse, lisses, hyalines ou plus souvent jautres à cause de la présence d'une substance granuleuse de cette couleur, pourvues d'une ande bulle gazeuse de de Bary.

Asques cylindriques à cylindro-clavés, 157-180 x 24-30 µm, 8-sporiques, unituniqués, n amyloïdes, légèrement aplatis au sommet, courtement stipités.

Paraphyses x 2-3 µm, cylindro-filiformes, septées, contenant une grande quantité de pig-



4 — *Lasiobolus diversisporus* : a = spores ; b = asque ; c = paraphyses ; d = excipulum médul- e = poils ; f = excipulum ectal ; g = rhizoïdes.

Fig.34 (Lasiobolus diversisporus): a= spores; b=ascus; c= paraphyses; d= medullary excipulum; e= hairs; f= ectal excipulum; g= rhizoids.

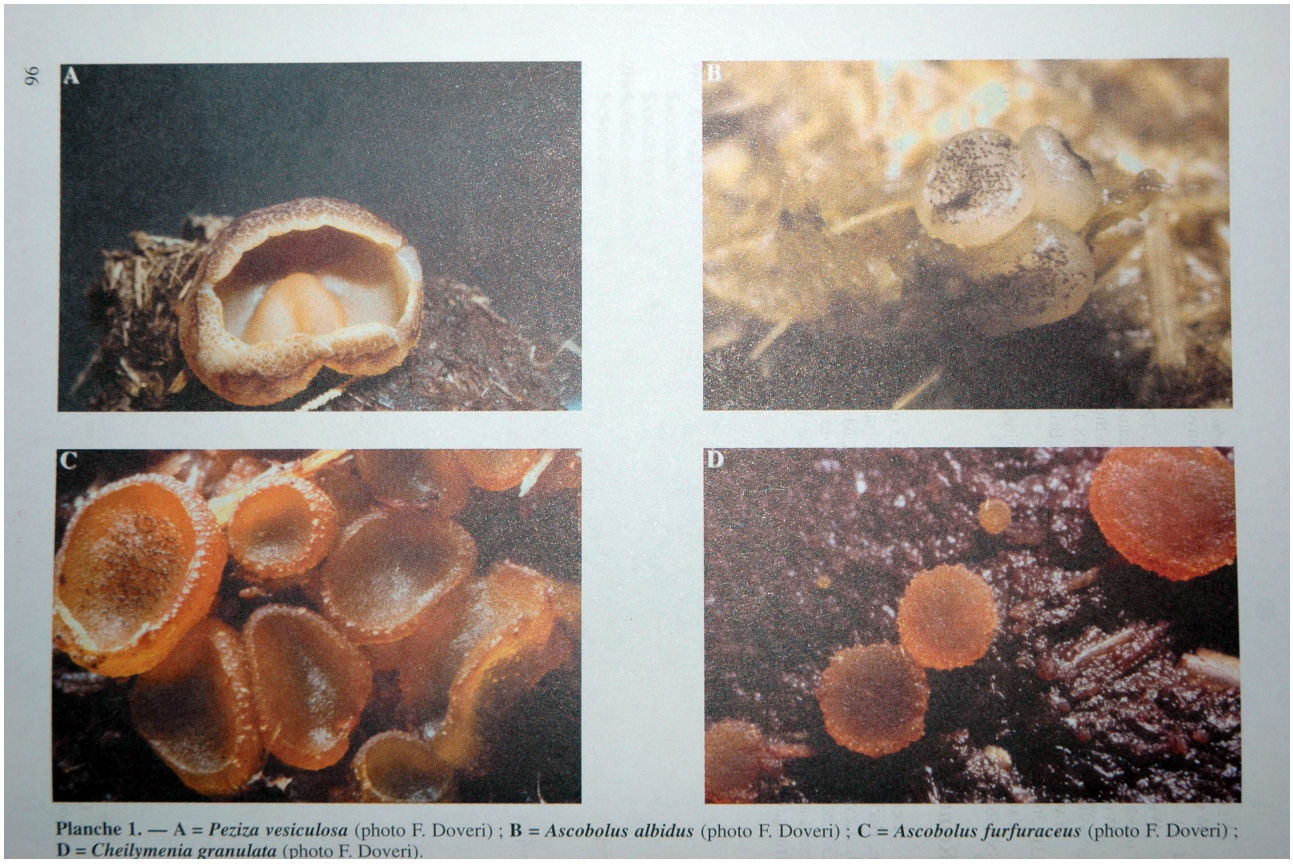


Planche 1. — **A** = ***Peziza vesiculosa*** (photo F. Doveri) ; **B** = ***Ascobolus albidus*** (photo F. Doveri) ; **C** = ***Ascobolus furfuraceus*** (photo F. Doveri) ; **D** = ***Cheilymenia granulata*** (photo F. Doveri).

Plate 1: a= Peziza vesiculosa (photo F. Doveri); b= Ascobolus albidus (photo F. Doveri); c= Ascobolus furfuraceus (photo F. Doveri); d= Cheilymenia granulata (photo F. Doveri).

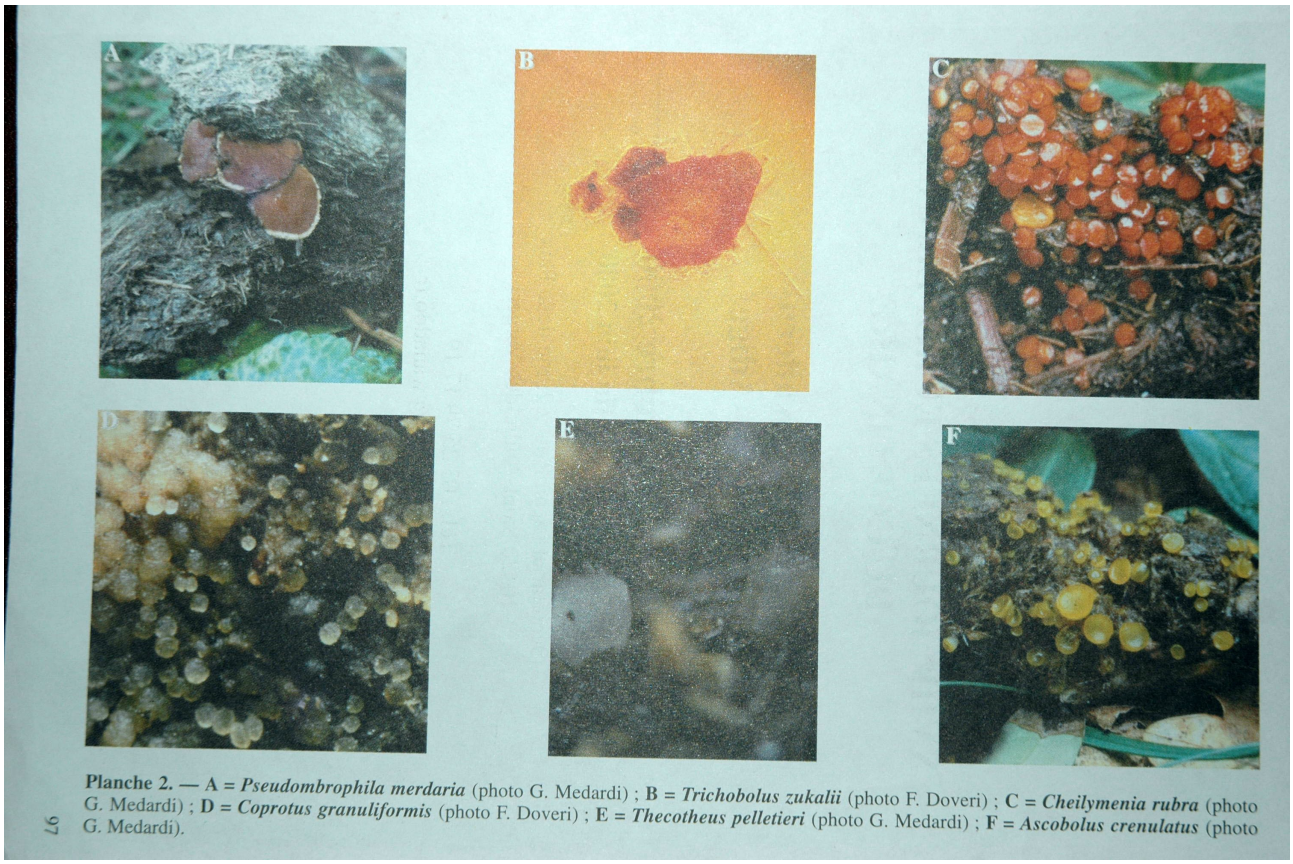


Planche 2. — **A** = ***Pseudombrophila merdaria*** (photo G. Medardi) ; **B** = ***Trichobolus zukalii*** (photo F. Doveri) ; **C** = ***Cheilymenia rubra*** (photo G. Medardi) ; **D** = ***Coprotus granuliformis*** (photo F. Doveri) ; **E** = ***Thecotheus pelletieri*** (photo G. Medardi) ; **F** = ***Ascobolus crenulatus*** (photo G. Medardi).

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Plate 2: a= Pseudombrophila merdaria (photo G. Medardi); b= Trichobolus zukalii (photo F. Doveri); c= Cheilymenia rubra (photo G. Medardi); d= Coprotus granuliformis (photo F. Doveri); e= Thecotheus pelletieri (photo G. Medardi), f= Ascobolus crenulatus (photo G. Medardi).