

50 or 60 yards away. It may be that remains of elm roots or timber are present in the soil. It might also be possible that the fungus had lived on the coniferous wood. The *Fomes* was found in four different places; it has now been removed at great cost and trouble.

STUDIES IN DISCOMYCETES II.

By *Jessie S. Bayliss Elliott, D.Sc. (Birm.), B.Sc. (Lond.)*

5. *Dasyscypha conformis* (Cooke) Sacc.

During the last two years I have often found on the dead stems of rushes *Erinella apala* (B. & Br.) Sacc. growing very plentifully and also *Dasyscypha conformis* (Cooke) Sacc.; sometimes both were growing together on the same clump of rushes. Massee (British Fungi, Vol. iv. p. 334) states that the latter species was unknown to him and also that he was unable to find the type specimen in Cooke's herbarium. Both Discomycetes are very similar except in microscopic characters, but after meeting the two frequently, one recognises readily with a hand lens *D. conformis* by its larger size and its sessile or very shortly stipitate form (fig. 3). It has been suggested that *D. conformis* might be an immature form of *E. apala*: but after studying both species I find the microscopic characters of the two very distinct.

Since Cooke's description of *D. conformis* copied by Massee is very incomplete and also has inaccurate spore measurements, I think it would be useful to describe the fungus again.

D. conformis. Gregarious or scattered, sessile or very shortly stipitate, .75-1 mm. diameter, cupulate becoming plane, fawn colour, covered with short, wide, colourless, obtuse, clavate, aseptate hairs filled with oil drops when fresh; excipulum parenchymatous, cells oblong; asci subcylindrical, 65-70 × 7 μ, apex obtuse, spores slenderly lanceolate 14-20 × 1.5 μ, one or two seriate, straight, sometimes slightly curved; paraphyses acerose, exceeding the asci, some narrow, others wide—5 μ, filled with oil drops when fresh (figs. 3, 4, 5, 6).

E. apala is distinguished from the above by the much longer spores arranged in a fascicle, the septate paraphyses which project further above the asci than do those of *D. conformis*, and also by the long narrow tapering hairs which surround the margin and cover the excipulum, and which form a sharp contrast to the obtuse clavate marginal hairs of *D. conformis* (figs. 7, 8.)

6. *Orbilia leucostigma* Fr., v. *xanthostigma* (Fr.) Rehm.

I have found this fungus very frequently growing luxuriantly and examined many specimens, also I have had it under observation while growing for many months. The form of the spores is described as elliptical or egg-shaped by Masee, Rehm and Saccardo; this description is misleading and incomplete since they are decidedly U-shaped: when the two ends of the U are in view the spores appear as two circles (o o) and only when the curved top of the U is in focus can they be called elliptical (figs. 9, 10). In Boudier's *Icones* they are figured as U-shaped.

This fungus seems to me identical with *O. coccinella* (Somm.) Fr. the spores of which are said to be slightly wider, being given as $3-4 \times 2\mu$, thus having only a trifling difference from $3-4 \times 1.5\mu$ (Masee) or $3-4 \times 2-3\mu$ (Boudier), the measurements of *O. leucostigma* v. *xanthostigma*; also the colour distinction is insignificant. *O. coccinella* is described as blood red or deep orange red while *O. leucostigma* v. *xanthostigma* is said to be yellow with sometimes a tinge of red when fresh. The specimens which I find usually vary from yellow to deep orange and often there is a sprinkling of whitish translucent forms among them while, when dry, a blood red colouration is usual, but this varies and is sometimes yellow; I have seen them just as blood red as those figured by Boudier as *O. coccinella*.

Although Boudier figures spores of *O. coccinella* as ellipsoid, in Engler and Prantl two figures of the spores are given, the one (profile view) showing a very curved, almost a U form, the other elliptical; thus all characters considered there is no real distinction between *O. leucostigma* v. *xanthostigma* and *O. coccinella*.

7. *Pyrenopeziza plicata* Rehm (= *Mollisia plicata* (Rehm) Sacc. sec. Boud.) f. *conicola*.

Ascophores scattered and crowded, $\frac{1}{2}-\frac{3}{4}$ mm. diameter, sessile, or when young very shortly stalked, closed and almost globose at first, becoming saucer-shaped or even repand when old; disc greyish, margin whitish, fimbriate, hairs septate and obtuse; excipulum olive brown or blackish, parenchymatous, rough with rounded hair-like outgrowths from the cortical cells, often more or less vertically wrinkled; asci cylindrical, apex somewhat narrowed, $80 \times 6\mu$; spores oblong, fusiform, hyaline, continuous, straight, or slightly curved; twoseriate; $10-12\mu \times 2\mu$; paraphyses slender, hyaline, equal, 2μ wide and same length as the asci (figs. 11, 14, 15, 17).

The apothecium is often attached to the substratum by a fringe of colourless hyphae (fig. 11a).

Habitat. Cones of *Pinus sylvestris*. Tanworth-in-Arden.

This is closely allied to *P. Mercurialis* (Fuck.) Boud., and also to *Mollisia atrata* (Pers.) Karst., with its numerous varieties, and allied species whose habitats are herbaceous stems.

Growing on the same cone in close relation with this Discomycete were crowds of small black pycnidia belonging to the genus *Phoma* and on the older specimens of these the young apothecia of the Discomycete could be seen, growing either out of the top or the sides (fig. 11); the inference seems justifiable that these pycnidia are the conidial stages of the Discomycete; the external appearance of the pycnidia even in microscopic detail resembles that of the Discomycete.

The pycnidia are erumpent and in many instances a scar similar to the one seen in connection with the pycnidium was also to be seen below the apothecium (fig. 11).

PHOMA CONICOLA. Pycnidia erumpent, gregarious or scattered spherical, 0.2 mm. diameter, sessile, olive brown or black, excipulum parenchymatous, rough with round hair-like outgrowths from the cortical cells, similar to the excipulum of *Pyrenopeziza plicata* Rehm f. *conicola*, at first closed, then open, margin fringed with septate colourless hairs which converge: pycnospores colourless, oblong $3 \times 1-1.5\mu$, some slightly bent, continuous, situated on short conidiophores, arising from the walls of the pycnidium (fig. 11b, 12, 13, 16, 18).

Habitat. Fallen cones of *Pinus sylvestris*. Tanworth-in-Arden.

Under very moist conditions the pycnospores ooze out and form a glistening white ball on the top of the pycnidium: this elongates, topples over and the pycnospores are dispersed in the surrounding moisture: they germinate within twenty-four hours in rain-water (fig. 18).

The pycnidia need far moister conditions for development than the apothecia, and by varying the humidity of the moist chamber containing a cone on which both of these forms were growing, either the one or the other prevailed.

Pyrenopeziza plicata Rehm has previously been found in Britain, but apparently not recorded. I have seen specimens from the herbarium of W. B. Grove collected by him at the Edge Hills on dead *Angelica* stems, 1884, and by C. B. Plowright collected at Kings Lynn on some dead herbaceous stems in 1873.

PHOMA CONICOLA n. sp.

Pycnidia gregaria vel sparsa, erumpentia, sphaerica, 0.2 mm. diam., sessilia, olivaceo-brunnea vel nigrescentia, excipulo parenchymatico, vesiculis e cellulis extimis oriundis obsito, ei Pyrenopezizæ simillimo, primo clausa, dein aperta, margine pilis achrois septatis convergentibus fimbriato. Sporulae

achroæ, oblongæ, $3 \times 1-1.5\mu$, interdum curvulæ, continuæ, sporophoris brevibus suffultæ.

8. *Hyalinia Leightoni* (Phill.) Boud. v. *lignicola*.

Scattered or crowded, confluent, sessile, glabrous, diaphanous, translucent, depressed or almost plane 1 to 1.5 mm. diameter; when dry angularly contracted with margin sometimes raised; hymenium whitish, excipulum parenchymatous and fuscous: asci cylindrical, apex narrowed $100 \times 8\mu$; spores $8-13 \times 2.5-3\mu$, elliptical with blunt ends, irregularly one or two seriate; paraphyses filiform, branched, same length as asci, $.5\mu$ wide (figs. 1, 2, 28, 29, 30).

Habitat. Decaying wood. Plowden near Shrewsbury, Sept. 1917.

This fungus seems to differ very little from *Calloria Leightoni* found by Phillips growing on a *Polyporus*, and which does not appear to have been seen since: it seems advisable however to consider it a variety as the substratum is very different, and the colour fuscous instead of yellow or white.

9. *Calloria extumescens* Karst.

Gregarious or often confluent, .3 to .5 mm. diameter, sessile, globose at first becoming plane or slightly concave, glabrous, sub-gelatinous when moist, excipulum formed of anastomosing hyphae, bright yellow when young, becoming flesh coloured or reddish brown; asci cylindrical clavate, $60 \times 6\mu$; spores hyaline continuous or uniseptate (rarely more) $10-13 \times 2\mu$, elliptical, ends rather acute; paraphyses filiform, $1-1.2\mu$ (figs. 23, 24, 25, 26, 27).

Habitat. On decaying oak. Bomere near Shrewsbury, Sept. 1917.

This agrees with Karsten's description of *C. extumescens* but according to Rehm the excipulum should be parenchymatous. Karsten does not describe the excipulum.

This fungus is also near *Mollisia Mali* (Rehm) Phill. (= *Urceolella Mali* (Rehm) Boud.) but differs in the confluent apothecia, the uniseptate spores, which sometimes even have two septa, also the colour which although bright yellow when quite young becomes flesh-coloured and reddish brown later.

10. *MOLLISIA POPULI* n. sp.

Gregarious, sessile, saucer-shaped, becoming plane and revolute, 1-2 mm. diameter, hymenium grey when young, pinkish or ochraceous when older; excipulum grey with an olive tinge, parenchymatous, margin fimbriate, asci cylindrical, $90-100 \times 7-10\mu$, apex narrowed, short pedicel, spores two

seriate, hyaline, narrowly fusiform, straight or slightly curved, continuous, one septate, $20-25 \times 2-3\mu$; paraphyses containing oily protoplasm in the terminal cell, hyaline, stout, septate, thickened upwards to $7-8\mu$ wide, apex narrowed length not exceeding the asci.

Habitat. On dead twigs and branches of poplar. Tanworth-in-Arden.

This fungus has some points of resemblance with *M. atrata* (Pers.) Karst. v. *eupatoricola* (Phill.), including the large conspicuous paraphyses, but it grows on wood not herbaceous stems, it is a bigger fungus, and its spores are longer varying from $20-25\mu$, instead of $10-18\mu$.

It also somewhat resembles *Niptera ramealis* Karst. (= *Mollisia ramealis* Karst. sec. Boud.), but although the spores are within Karsten's wide limits of $14-30\mu$, they are not blunt at the ends neither are the paraphyses thread-like, being much wider than the outside limit given (3μ), being as wide as the ascus, $7-8\mu$.

Rehm considers *N. ramealis* Karst. the same as *Belonidium ventosum* (Karst.) Phill. (*M. ventosa* Karst. sec. Boud.); if that is so, the above fungus differs considerably since it has a parenchymatous excipulum and a fimbriate margin in contrast with the excipulum of interwoven hyphae and smooth margin of *M. ventosa*, also the spores are larger and the paraphyses very different.

This fungus was found in August 1917, growing on branches which had been pruned from a flourishing young poplar tree less than two months previously, and left lying in a heap on the ground.

MOLLISIA POPULI n. sp.

Gregaria, sessilis, patelliformis, dein plana ac revoluta, 1-2 mm. diameter; hymenium junius cinereum, senius incarnatum vel ochraceum; excipulum olivaceo-cinereum, parenchymaticum, margine fimbriato. Asci cylindrici, $90-100 \times 7-10\mu$, apice attenuato, pedicello brevi. Sporidia biseriata, hyalina, anguste fusiformia, recta vel leviter curvata, continua, 1-septata, $20-25 \times 2-3\mu$; paraphyses haud ascos superantes, hyalinæ, amplæ, septatæ, superne ad $7-8\mu$ incrassatæ, apice ipso attenuatæ.

I wish to express my thanks to Mr W. B. Grove, M.A., for useful criticism and help in various ways and also to the late Prof. G. S. West for the loan of books of reference.

DESCRIPTION OF PLATE VI

Fig.

1. *Hyalinia Leightoni* v. *lignicola*. Asci and paraphyses.
2. Parenchymatous excipulum of *H. Leightoni* v. *lignicola*.
3. *Dasyscypha conformis*. Apothecia.
4. Ascospores.
5. Clavate marginal hairs and parenchymatous excipulum.
6. Aseptate paraphyses containing oil drops and asci.
7. *Erinella apala*. Septate paraphyses and ascus containing a fascicle of ascospores.
8. Tapering marginal hairs incrustated with crystals.
9. *Orbilia leucostigma* v. *xanthostigma*. Ascospore.
10. Asci containing ascospores.
- 11a. *Pyrenopeziza plicata* f. *conicola*. Apothecia.
- b. Pycnidia of *Phoma conicola*.
The apothecia are to be seen growing among and arising from the pycnidia.
12. Young pycnidium of *Phoma conicola*. The young apothecium of *P. plicata* f. *conicola* is similar in all detail.
13. Pycnospores oozing out of a pycnidium.
14. Asci and paraphyses of *P. plicata* f. *conicola*.
15. Section through young apothecium of *P. plicata* f. *conicola* showing the rounded hair-like growths on the excipulum.
16. Section through young pycnidium of *Phoma conicola*.
17. Apothecia of *P. plicata* f. *conicola* on cone.
18. Pycnidium of *Phoma conicola* with the rounded glistening mass of pycnospores imbedded in mucilage.
19. *Mollisia Populi*. Apothecia.
20. Ascospores of *M. Populi*.
21. Excipulum with fimbriate margin.
22. Paraphyses—narrow and wide varieties; also ascus containing ascospores.
23. *Calloria extumescens*. Confluent apothecia.
24. Excipulum formed of anastomosing hyphae.
25. Apothecia of *C. extumescens*.
26. Asci and paraphyses.
27. Ascospores, continuous and uniseptate.
28. *Hyalinia Leightoni* v. *lignicola*. Apothecia.
29. Apothecia, crowded and confluent.
30. Ascospores.