Notes on *Curreya* (Ascomycetes, Dothideales)

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The genus *Curreya* was described by Saccardo (1883) for *Homostegia conorum* Fuckel, a fungus growing on cone scales of *Pinus sylvestris* in Germany. Several more species were added which were later excluded by Theissen & Sydow (1915) and other authors. Theissen & Sydow classified the genus in the Dothideales. *Curreya conorum* (Fuckel) Sacc. was collected again by G. Moesz in Hungary and this specimen was described in detail by Petrak (1940). He classified the fungus as *Cucurbitaria conorum* (Fuckel) Petrak because of the pycnidial anamorph, known as *Coniothyrium glomerulatum* Sacc. According to him, other *Cucurbitaria* species should also include *Coniothyrium* anamorphs.

Von Arx & Müller (1975) reintroduced the genus *Curreya* for *C. conorum* and *C. pithyophila* (Fr.) v. Arx & Müller (= *Cucurbidothis pithyophila* (Fr.) Petrak, both parasitic on conifers *Abies, Picea, Pinus*. The genus *Cucurbitaria* S. F. Gray was restricted to species growing on broad leaved plants, having botryose, ostiolate ascomata and *Camarosporium* or *Diplodia* anamorphs. Barr (1981) transferred *C. conorum* to *Pleospora* and retained the genus *Cucurbidothis* for *C. pithyophila*.

The following description is based on the type specimen, maintained in S.

Curreya conorum (Fuckel) Sacc. – Fig. 1: 1–4

Homostegia conorum Fuckel – Jahrb. Nassau. Ver. Naturk. 29/30: 25. 1875.
Curreya conorum (Fuckel) Sacc. – Syll. Fung. 2: 651. 1883.
Cucurbitaria conorum (Fuckel) Petrak – Annls Mycol. 38: 216. 1940.
Pleospora conorum (Fuckel) Barr – Mycologia 73: 601. 1981.

Anamorph: *Coniothyrium glomerulatum* Sacc.

Stromata immersed in the host tissue, sclerotium-like, irregular, often conical, becoming erumpent with the upper part, usually containing a single locule, occasionally multilocular, 300–500 μm diam, 210–350 μm high, composed mainly of a scleroplectenchyma of hyaline or subhyaline, angular, thick-walled cells, 6–15 μm in diam, surrounded by a 9–14 μm thick wall of thick-walled, dark brown, often rather indistinct cells, 3–6 μm in diam; loculi spherical or conical, 200–260 μm in diam, without preformed ostiolum,

surrounded with hyaline, flattened cells; asci developing from the base of the loculi synchronously with paraphyses, cylindrical-clavate, apically rounded, with a short stalk at base, bitunicate, thick-walled in the apical part (wall at the apex 5–7 μm thick), 8-spored, 90–140×22–28 μm; ascospores ellipsoidal-fusiform, 1-septate when young, soon becoming 3-septate, with 5–7 transverse and 1–3 longitudinal or oblique septa when mature, slightly constricted at the 3 primary septa, deep chocolate brown, smooth-walled, 23–30×10–14 μm; paraphyses filiform, often branched apically, hyaline, indistinctly septate, 1.5–2.5 μm broad, with evanescent walls.

The type specimen contained only loculi of the teleomorph. At the apex the loculi are usually slightly conical, but no apical ostiolar pore is present. The erumpent part of the stromata apparently is disrupted at maturity by internal pressure.

Both the teleomorph and the *Coniothyrium* anamorph were observed on a collection on cones of *Pinus sylvestris* from Egerkingen, Switzerland in 1969 (herb. von Arx). This collection agrees in all respects with the description given by Petrak (1940). The stromata contain loculi of both teleomorph and anamorph or only of the anamorph.

Curreya conorum without doubt is not congeneric with *Pleospora herbarum* (Pers.) Rabenh., the type species of the genus *Pleospora,* as was proposed by Barr (1981). *P. herbarum* is a very common fungus on herbaceous stems. The spherical or conical, distinctly ostiolate ascomata have a thick wall composed of a pseudoparenchyma of distinct, angular, pigmented cells. The young ascomata are filled with a plectenchyma of elongate cells arranged in vertical rows, between which the asci develop. The asci are cylindrical, have relatively thin but persistent walls and the ascospores are ochraceous or golden yellow. *Pleospora herbarum* is the teleomorph of *Stemphylium botryosum* Wallr., a dematiaceous hyphomycete with many-celled, pigmented poroconidia.

The genus *Pleospora* in its present delimitation includes about 200 species and without doubt is heterogeneous. Numerous species will have to be transferred to other genera, e. g. *Strickeria* Körber and *Montagnula* Berlese (von Arx & Müller, 1975). Closely related to *Pleospora* are genera with similar ascomatal structures and with similar anamorphs, e. g. *Comoclathris* Clem. (anamorph: *Alternaria* or *Stemphylium*), *Buergenerula* Syd. (anamorph unnamed), *Cochliobolus* Drechsler (anamorph: *Curvularia* Boedijn or *Bipolaris* Shoemaker), *Setosphaeria* Leonard & Suggs (anamorph: *Exserohilum* Leonard & Suggs) and *Pyrenophora* Fr. (anamorph: *Drechslera* Ito).

Curreya on the other hand is similar to other ascomycete genera which include species with *Coniothyrium* or *Aposphaeria* anamorphs (*Aposphaeria* auct. is *Coniothyrium* like, but stromatic and the conidia often remain hyaline or subhyaline). The following genera include species with such anamorphs: *Melanomma* NITS. ex FUCKEL, *Didymosphaeria* FUCKEL, *Paraphaeosphaeria* O. ERIKSSON and *Massarina* SACC. These genera have been excluded from the Pleosporaceae s. str. by MÜLLER (1979). BARR (1979) and ERIKSSON (1981) classified them in separate families, viz. Melanommataceae, Didymosphaeriaceae, Massarinaceae and Phaeosphaeriaceae, in Pleosporales and Melanommatales. A single family Melanommataceae of the Dothideales sensu von ARX & MÜLLER (1975) would be more appropriate. *Melanomma* for example is closely related to *Curreya,* but has ostiolate ascomata (?) and the ascospores have only transverse septa (as they have in *Curreya pithyophila* var. *cembrae* (REHM) v. ARX, comb. nov [= *Cucurbidothis pithyophila* var. *cembrae* (REHM) HOLM = *Cucurbitaria pithyophila* var. *cembrae* REHM – Ber. Naturhist. Ver. Augsburg 26: 38. 1881]). The inclusion of *Cucurbidothis* in *Curreya* or its maintenance as a separate genus is debatable. In our opinion, *Curreya conorum* is only a cone-inhabiting relative of *C. pithyophila* with slightly larger ascospores and smaller stromata. In the latter species, the anamorph is also often absent (HOLM, 1967; CASAGRANDE, 1969).

The Melanommataceae WINTER (including Didymosphaeriaceae MUNK, Massarinaceae MUNK, Phaeosphaeriaceae BARR and Cucurbitariaceae WINTER) can be characterized as follows:

Ascomata or stromata immersed in the host tissue, often becoming erumpent, surrounded by a dark wall of small, angular or flattened, often indistinct cells, inner part often scleroplectenchymatic and hyaline; loculi spherical, ovate or conical, ostiolate or non-ostiolate, with a wall of flattened, hyaline cells; asci developing synchronously with the paraphyses, cylindrical-clavate, bitunicate, rather thick-walled, especially in the apical part; paraphyses numerous, filamentous, often branched and anastomozing, with evanescent walls or embedded in a mucoid mass, surrounding the asci and filling the ostiolar pore or the apical opening; ascospores elongate, often with attenuated ends, 2-celled when young, remaining so or becoming many-celled, hyaline or more often pigmented; anamorph pycnidial, stromatic; conidial cavities spherical, ovate or conical, usually ostiolate; conidia formed successively (basipetally) at the apex of short conidiogenous cells, 1-celled or septate, hyaline or more often pigmented, extruded in a mucoid mass.

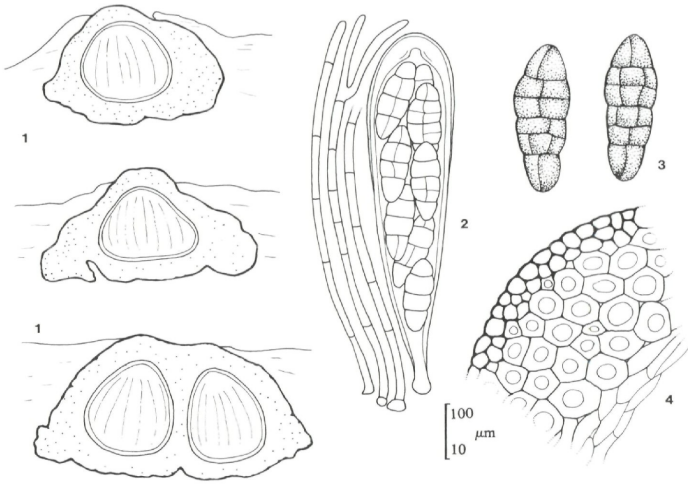

Fig. 1. *Curreya conorum*. 1. ascomata. – 2. ascus and paraphyses. – 3. ascospores. – 4. part of the stroma and the ascomatal wall (from the type, S).

Representative genera:

teleomorph	anamorph(s)
Melanomma	*Coniothyrium, Aposphaeria*
Didymosphaeria	*Coniothyrium*
Paraphaeosphaeria	*Coniothyrium*
Curreya	*Coniothyrium*
Massarina	*Coniothyrium (Microsphaeropsis)*
Phaeosphaeria	*Stagonospora, Hendersonia*
Herpotrichia	*Pyrenochaeta, Phoma, Coniothyrium*
Cucurbitaria	*Camarosporium, Phoma*

Related genera

teleomorph	anamorph(s)
Didymella	*Ascochyta, Phoma*
Keissleriella	*Ascochyta, Phoma*
Gilletiella	*Ascochyta*-like.

References

Arx, J. A. von & Müller, E. (1975). A re-evaluation of the bitunicate Ascomycetes with keys to families and genera. – Stud. Mycol. 9, 159 p.

BARR, M. E., 1979. A classification of the Loculoascomycetes. – Mycologia 71: 935–957.

BARR, M. E., 1981. The genus *Curreya:* an example of taxonomic confusion in the Ascomycetes. – Mycologia 73: 599–609.

CASAGRANDE, F., 1969. Ricerche biologiche e sistematiche su particolare ascomiceti pseudosferiali. – Phytopath. Z. 66: 97–136.

ERIKSSON, O., 1981. The families of bitunicate Ascomycetes. – Opera Botanica 60, 220 p.

HOLM, L., 1967. Taxonomic notes on Ascomycetes. – Svensk bot. Tids. 61: 449–456.

MÜLLER, E., 1979. Report of the bitunicate committee. – In B. KENDRICK (Ed.): The whole fungus 1: 396–410 (Ottawa, Canada).

PETRAK, F., 1940. Über die Gattung *Curreya*. – Annls Mycol. 38: 215–216.

THEISSEN, F. & SYDOW, H., 1915. Die Dothideales. – Annls Mycol. 13: 149–746.