

CALONECTRIA De Not., Comment. Soc. Crittogam. Ital. 2: 477. 1867.

Type: *C. daldiniana* De Not., a synonym of *C. pyrochroa* (Desm.) Sacc.

Ascomata superficial, solitary or gregarious, often on a small, basal pad of pseudoparenchymatous tissue, without a byssoid subiculum or well-developed stroma. Ascomata globose to ovoid, orange to scarlet or dark umber, rarely yellow, KOH+ dark red, yellow in lactic acid, ascomatal base darkened, scaly to warted. Ascomatal wall of two regions: outer region of thick-walled, globose to angular cells extended to form scales or warts; inner region of hyaline, thin-walled, elongate cells. Asci clavate to long-clavate, apex usually simple, asci often evanescent at maturity. Ascospores ellipsoid to long-fusiform, 1- to multiseptate. Anamorph, where known, *Cylindrocladium*. Saprobic and pathogenic on dicotyledonous and monocotyledonous plants, often fruiting on decaying leaves.

NOTES.— This genus was established with one species that resembled *Nectria* but had three-septate ascospores. Saccardo (1883) interpreted *Calonectria* to include all *Nectria*-like species having ascospores with 2 or more septa. He transferred over one hundred species to *Calonectria* and divided the genus into sections based on the number of ascospore septa. The type specimen of *C. daldiniana* was redescribed by Rossman (1979a), who recircumscribed the genus *Calonectria* to include only those species having a characteristic ascomatal wall structure and a *Cylindrocladium* anamorph. Ascomata are usually firmly attached to the substratum and have a dark base at the point of attachment. *Calonectria* is morphologically similar to *Leuconectria* and '*Nectria*' *radicicola*, the teleomorph of *Cylindrocarpon destructans*, in both teleomorph and anamorph. *Calonectria* may be closely related to these taxa as suggested by the molecular work of Rehner & Samuels (1995).

Rossman (1979b) accounted for all species placed in *Calonectria* and monographed the five accepted species (Rossman, 1983). Since then two monographs have appeared following that generic concept both concerned primarily with the *Cylindrocladium* anamorphs. Peeraly (1991) presented a synopsis of ten species of *Calonectria* and their *Cylindrocladium* anamorphs as well as six additional species of *Cylindrocladium*. Crous & Wingfield (1994) described and illustrated 16 species of *Calonectria* and their *Cylindrocladium* anamorphs as well as 7 additional species of *Cylindrocladium*. A number of important pathogens and new species continue to be described (Crous *et al.*, 1997; El Gholl *et al.*, 1997). *Calonectria ilicicola* Boedijn & Reitsma, often as the

anamorph *Cylindrocladium parasiticum* Crous *et al.*, previously referred to as *C. crotalariae*, is the cause of *Cylindrocladium* black root, a serious pod and root necrosis disease of peanuts (*Arachis hypogaea* L.) in the United States (Kokalis-Burelle *et al.*, 1997).

SPECIMEN ILLUSTRATED.— VENEZUELA. El Limón, pr. Puerto La Cruz, on dead leaves of *Ficus radula*, 18 Jan 1928, H. Sydow, Fungi exotici exsiccati 837 (S – isotype of *Nectria venusta*): Plate 22, d (page 96).

Calonectria pyrochroa (Desm.) Sacc., *Michelia* 1: 308. 1878.

= *Nectria pyrochroa* Desm., *Pl. Crypt. France* Ed. 2(2), no. 372. 1856.

= *Calonectria daldiniana* De Not., *Comment. Soc. Crittogam. Ital.* 2: 477. 1867.

= *Ophionectria puiggarii* Speg., *Bol. Acad. Nac. Ci.* 11: 532. 1889.

= *Nectria abnormis* Henn., *Hedwigia* 36: 219. 1897.

Anamorph: *Cylindrocladium ilicicola* (Hawley) Boedijn & Reitsma, *Reinwardtia* 1: 57. 1950 [as '*ilicicolum*'].

= *Candelospora ilicicola* Hawley, in Rea & Hawley, *Proc. Roy. Irish Acad.* 31: 11. 1912.

Ascomata solitary, superficial, erumpent through and firmly adhering to the substratum, globose to ovoid, 300–410 × 320–380 µm, collapsing laterally or not at all when dry, red-orange to dark red, KOH+ rose to purple, often with a white to yellow cast due to scurfy outer wall, papilla indistinct to small, pointed, often darker. Ascomatal wall of two intergrading regions: outer region of *textura angularis*, becoming *textura globulosa* toward the outside, outer cells globose, large, 20–35 µm diam, walls pigmented, slightly thickened, up to 1.5 µm, outermost cells only loosely adhering to the ascoma, forming a thin scurf; rarely with long, straight, sparsely scattered, septate hairs 127–179 × 7–8 µm, occasionally branched, tapering gradually to an acuminate apex; inner region of hyaline, thin-walled, elongate cells. Asci broadly obovate to clavate, thin to evanescent at maturity, 64–90 × 17–25 µm, apex simple, sometimes with a short stalk on young asci, 8-spored, ascospores pluriseriate. Apical paraphyses present in young ascomata but disappearing at maturity. Ascospores narrowly fusiform with rounded ends, often curved or sigmoid, 40–70 × 4–7 µm, 1–3-septate, rarely 5- or 7-septate, hyaline, sometimes slightly constricted at each septum, smooth or becoming minutely roughened.

ANAMORPH: Sporulating branches erumpent, forming a black-rimmed spot, arising at the base of the ascomata or from the substratum surface or, in culture, from pigmented hyphae at the surface of the colony; branching monopodial or opposite, branches 5–6 µm wide, with a septum at the base of each branch.

HABITAT.— On leaves, shoots and stems of numerous dicotyledonous plants.

DISTRIBUTION.— Europe, North America, and South America.

TYPE SPECIMENS were examined as reported by Rossman (1979b, 1983).

ILLUSTRATIONS.— Crous & Wingfield (1994, Figs. 12 A–C); Rossman (1979a, Figs. 1–4; 1983, Figs. 25–26, 8C–D).

NOTES.— Crous & Wingfield (1994) present a review of the biology of this species.

CALOSTILBE Sacc. & Syd., Syll. Fung. 16: 591. 1902.

Type: *C. longiasca* (A. Möller) Sacc. & Syd. (= *Sphaerostilbe longiasca* A. Möller), recognized as *C. striispora* (Ellis & Everh.) Seaver.

= *Phaeonectria* (Sacc.) Sacc. & Trotter, Syll. Fung. 22: 485. 1913 (= *Nectria* subgenus *Phaeonectria* Sacc., Syll. Fung. 11: 359. 1895). — Type: *Nectria striispora* Ellis & Everh., recognized as *C. striispora*.

Anamorph: *Calostilbella*

Stromata well-developed, originating from a central point, pseudoparenchymatous below the ascomata, giving rise to synnemata, ascomata forming at the base and on rhizoids that arise from the stromata, growing under bark and breaking through at points. Ascomata superficial, densely aggregated, ovoid, not collapsing or collapsing laterally when dry, orange, KOH+ sienna, apical region with acute papilla. Ascomatal surface prosenchymatous, walls thickened. Ascomatal wall 40–70 µm thick, of two regions: outer region about 30 µm thick, of elongate interwoven cells perpendicular to the surface, 3–5 µm diam, with thickened walls and narrow lumina; inner region of flattened cells with thickened walls. Asci clavate, apex simple, base pointed to pedicellate, ascospores biserial. Ascospores fusiform–ellipsoid, one-septate, slightly constricted or not, translucent yellow-brown, coarsely striate, striations appearing as longitudinal furrows. Anamorph *Calostilbella*. Sterile elements interspersed with phialides. Conidia ellipsoid, 1-septate, translucent yellow-brown. On decaying woody dicotyledonous and monocotyledonous substrata, often fruiting on newly killed wood.

NOTES.— *Calostilbe* was originally described for species that were like *Sphaerostilbe* but differed in having colored ascospores and an 'arthrosporoid conidial state' (Seaver, 1928). Samuels (1973a) reviewed the *Nectria*-like fungi having golden to brown ascospores. He did not consider ascospore color to be a distinctive generic character and placed all species of *Nectria*-like fungi in the genus *Nectria sensu lato*, rather than in

genera segregated from *Nectria* on the basis of ascospore color alone. A number of *Nectria*-like genera have stilbellaceous anamorphs and these are distributed throughout the *Nectriaceae*. The only species included in the original description of the genus *Calostilbe* was *C. longiasca*, for which *Nectria striispora* provides the oldest epithet. *Calostilbe striispora* is an unusual and distinctive species occurring commonly in tropical regions in both its teleomorph and anamorph (Hewings & Crane, 1984). *Calostilbe* is recognized at the generic level because the type and only species is unique among hypocrealean fungi. The ascomatal wall of *C. striispora* is composed of thick-walled cells that form a *textura epidermoidea* in an upright palisade of interwoven cells visible below the white to pale yellow scurf. Although bearing some resemblance to *Neonectria* in the distinctive ascomatal wall structure of the '*Nectria*' *mammoidea*-group (Booth, 1959), *Calostilbe* is unlike *Neonectria* in the furfuraceous outer ascomatal layer, the large, striate, yellow-brown ascospores, and the distinctive synnematus anamorph.

Nectria subgenus *Phaeonectria* was established for one species of *Nectria* having yellow-brown ascospores, namely *N. striispora*. When the taxon was raised to generic rank by Saccardo & Trotter (1913), *P. olivacea* was added to the genus. In raising *Nectria* subgenus *Phaeonectria* to generic rank, reference was made to the original publication, although *Nectria striispora* was never formally transferred to *Phaeonectria*. We follow Samuels (1973a) who accepted the reference to the subgeneric description in the text of generic recognition as sufficient to consider *Nectria striispora* as type of the taxon, despite the fact that *N. striispora* was never formally transferred to *Phaeonectria*. Thus, *Phaeonectria* is a later synonym of the unispecific genus *Calostilbe*.

Calostilbe striispora (Ellis & Everh.) Seaver, Mycologia 20: 248. 1928. — Plate 27, a–d.

= *Nectria striispora* Ellis & Everh., in C.L. Smith, Bull. Iowa Univ. Lab. Nat. Hist. 2: 398. 1893.

= *Macbridella striispora* (Ellis & Everh.) Seaver, Mycologia 1: 196. 1909.

= *Letendreaa striispora* (Ellis & Everh.) Weese, Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl., Abt. 1, 125: 514. 1916.

= *Sphaerostilbe longiasca* A. Möller, Bot. Mitt. Tropen 9: 122. 1901.

= *Calostilbe longiasca* (A. Möller) Sacc. & P. Syd., Syll. Fung. 16: 591. 1902.

= *Letendreaa longiasca* (A. Möller) Weese, Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl., Abt. 1, 128: 742. 1919.

= *Nectria longiasca* (A. Möller) E. Müll., in Müller & von Arx, Beitr. Kryptogamenfl. Schweiz 11(2): 636. 1962.

= *Sphaerostilbe musarum* Ashby, Bull. Dept. Agric. (Kingston), N.S. 2: 118. 1914.