

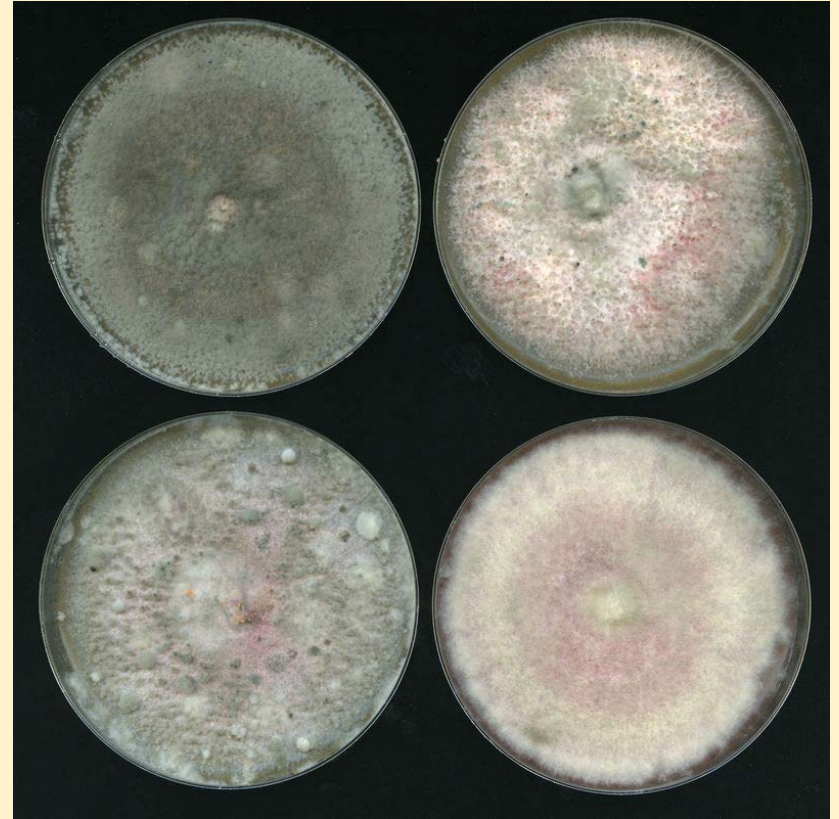
# Introduction to *Colletotrichum*

AANZFTA ECWP Diagnosis of Plant Diseases Workshops, 22-26 June 2015



# *Colletotrichum*

- One of the most common plant pathogens, endophytes, saprobes and epiphytes
- Worldwide importance
- Best known as the cause of plant diseases called “anthracnose”
- Almost 900 species names have been described in the literature



# *Colletotrichum* species described over recent years and decades

1970-1980	26
1980-1990	10
1990-2000	8
2000	2
2001	5
2002	1
2003	3
2004	0
2005	3
2006	1
2007	1
2008	22
2009	4
2010	6
2011	57
2012	22
2013	13
2014	0
2015	0

What happened in 2011?



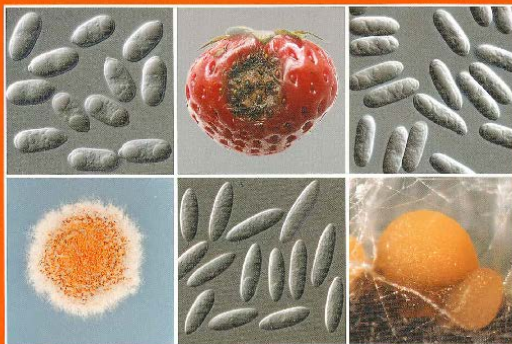


# Colletotrichum

Studies in Mycology 73 (September 2012)

## *Colletotrichum*: complex species or species complexes?

Ulrike Damm, Paul F. Cannon and Pedro W. Crous, editors



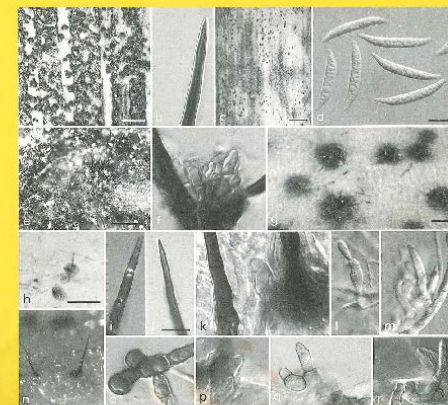
CBS-KNAW Fungal Biodiversity Centre,  
Utrecht, The Netherlands  
An Institute of the Royal Netherlands Academy of Arts and Sciences

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Volume 39, 18 December 2009

## Fungal Diversity

An International Journal of Mycology



THEME: COLLETOTRICHUM

Kunming University of Science and Technology

Web site <http://www.fungaldiversity.org>

# Colletotrichum

Prior to molecular studies, the taxonomy of *Colletotrichum* relied on Sutton (1980).

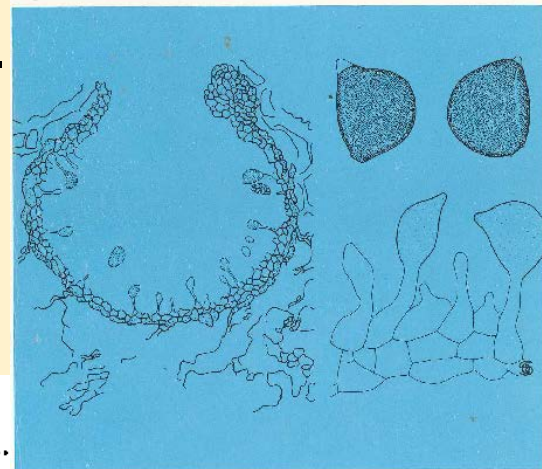


COMMONWEALTH MYCOLOGICAL INSTITUTE

## The Coelomycetes

Fungi Imperfecti with Pycnidia  
Acervuli and Stromata

BRIAN C. SUTTON



### COLLETOTRICHUM KEY

1. Conidia straight ..... 3
1. Conidia falcate ..... 4
  2. Conidia fusiform (attenuated at each end) ..... 3
  2. Conidia cylindrical ..... 4
3. Colonies lacking sclerotia; medium with pink pigmentation; wide host range ..... *C. acutatum*
3. Colonies with abundant setose sclerotia; conidia medianly constricted; frequently on Solanaceae ..... *C. coccodes*
3. Conidia sometimes slightly curved, 15-19 × 4 μ; on Brassicae ..... *C. higginsianum*
3. Conidia sometimes slightly curved, 14-17 × 3.5-4 μ; mycelial chlamydospores present; appressoria absent; on Scrophulariaceae ..... *C. fuscum*
4. Conidia rarely more than 12 μ long; appressoria small; spherical sclerotia present; on Leguminosae ..... *C. lindemuthianum*
4. Conidia more than 12 μ long ..... 5
5. Conidia 4.5-6 μ wide ..... 6
5. Conidia usually not more than 4.5 μ wide ..... 7
  6. Conidia 10-15 × 4.5-6.5 μ; setae present; appressoria typically crenate; often on Orchidaceae ..... *C. crassipes*
  6. Conidia 12-17 × 4.5-5.5 μ; sclerotia and setae absent; appressoria irregular but with large or deep lobes; on Musa ..... *C. musae*
  6. Conidia 14-15 × 4.5-6 μ; sclerotia and setae present; appressoria long clavate, entire; on Cucurbitaceae ..... *C. gloeosporioides*

# *Colletotrichum*

Prior to molecular studies, the taxonomy of *Colletotrichum* was based on

- host (or substrate)
- size and shape of conidia
- presence or absence of setae
- formation of teleomorphs
- growth rate of cultures
- colour of cultures



**appresorium**

**acervulus**

**conidia**

**setae**

**hyphae**

**infection peg**

**conidiophore**



# *Colletotrichum*

## Teleomorphic stage

- Sometimes formed in cultures
- Most names in *Glomerella* are synonyms of *Colletotrichum* spp.
- Perithecia globose
- Asci 8-spored
- Ascospores 1-celled, hyaline





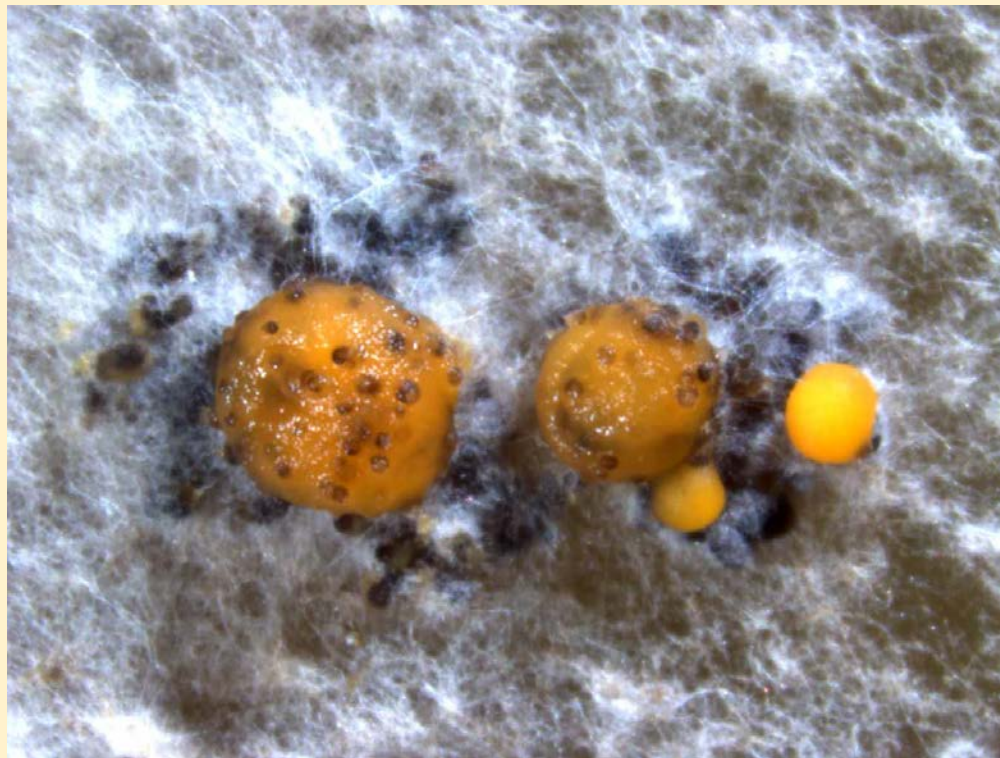
# Perithecia



# Group task

What are the important plant diseases caused by *Colletotrichum* spp. in your country?

How do you identify species of *Colletotrichum* in your laboratory?



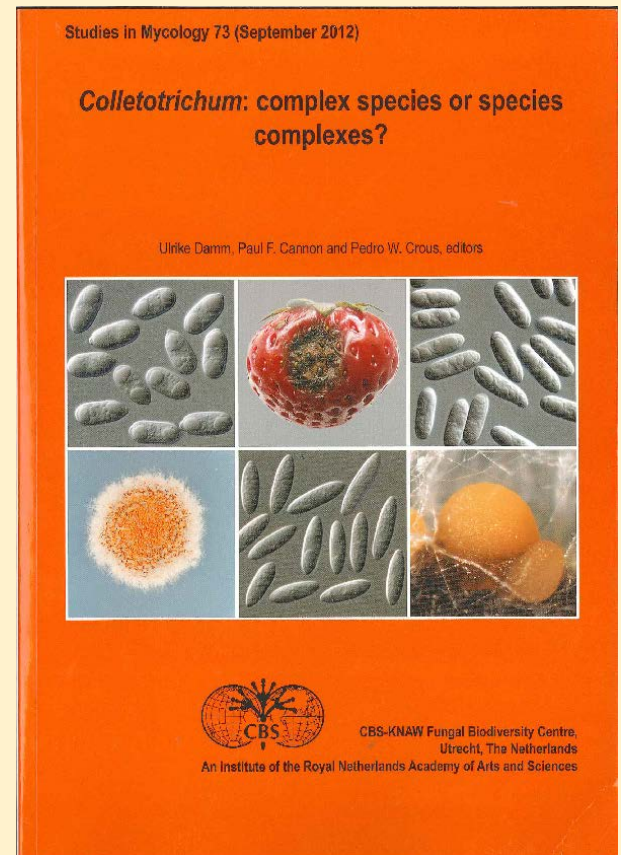


# *Colletotrichum*

At least 9 major species complexes.

Cannon et al. (2013) *Studies in Mycology* 73: **302**

- *acutatum*
- *graminicola*
- *sphaethianum*
- *destructivum*
- *dematium*
- *gloeosporioides*
- *boninense*
- *truncatum*
- *orbiculare*



# *Colletotrichum*

## Some interesting facts

- *Colletotrichum* species associated with grasses have curved conidia.
- *Colletotrichum gloeosporioides* is most often found in association with *Citrus*.
- *Colletotrichum* species in the *boninense* complex have scars at the base of the conidia.
- *Colletotrichum* species in the *acutatum* complex have conidia with acute ends.





## 2075

*Colletotrichum euphorbiae* Damm & Crous, sp. nov.

*Figure 1* **Gen. Area.** Western Cape Province, Kasterbosch Botanical Garden, at entrance of *Agave* house. (Landscape: 2009, Sept. 10; 12.5° 34' 50" S, 18° 42' 30" E; 124249; altitude: 655 m; 134795 = GPS; 13478, ITS sequence GenBank KF777483, RAPD sequence GenBank KF777494, T1R2 sequence GenBank KF777247, AOT sequence GenBank JF777454, CHS4 sequence GenBank JF777455, H5S sequence GenBank JF777456, AU sequence GenBank KF777252. *Agave* bark: 1347892, 1347893, 1347894, 1347895, 1347896, 1347897, 1347898, 1347899, 1347900, 1347901, 1347902, 1347903, 1347904, 1347905, 1347906, 1347907, 1347908, 1347909, 1347910, 1347911, 1347912, 1347913, 1347914, 1347915, 1347916, 1347917, 1347918, 1347919, 1347920, 1347921, 1347922, 1347923, 1347924, 1347925, 1347926, 1347927, 1347928, 1347929, 1347930, 1347931, 1347932, 1347933, 1347934, 1347935, 1347936, 1347937, 1347938, 1347939, 1347940, 1347941, 1347942, 1347943, 1347944, 1347945, 1347946, 1347947, 1347948, 1347949, 1347950, 1347951, 1347952, 1347953, 1347954, 1347955, 1347956, 1347957, 1347958, 1347959, 1347960, 1347961, 1347962, 1347963, 1347964, 1347965, 1347966, 1347967, 1347968, 1347969, 1347970, 1347971, 1347972, 1347973, 1347974, 1347975, 1347976, 1347977, 1347978, 1347979, 1347980, 1347981, 1347982, 1347983, 1347984, 1347985, 1347986, 1347987, 1347988, 1347989, 1347990, 1347991, 1347992, 1347993, 1347994, 1347995, 1347996, 1347997, 1347998, 1347999, 1348000, 1348001, 1348002, 1348003, 1348004, 1348005, 1348006, 1348007, 1348008, 1348009, 1348010, 1348011, 1348012, 1348013, 1348014, 1348015, 1348016, 1348017, 1348018, 1348019, 1348020, 1348021, 1348022, 1348023, 1348024, 1348025, 1348026, 1348027, 1348028, 1348029, 1348030, 1348031, 1348032, 1348033, 1348034, 1348035, 1348036, 1348037, 1348038, 1348039, 1348040, 1348041, 1348042, 1348043, 1348044, 1348045, 1348046, 1348047, 1348048, 1348049, 1348050, 1348051, 1348052, 1348053, 1348054, 1348055, 1348056, 1348057, 1348058, 1348059, 1348060, 1348061, 1348062, 1348063, 1348064, 1348065, 1348066, 1348067, 1348068, 1348069, 1348070, 1348071, 1348072, 1348073, 1348074, 1348075, 1348076, 1348077, 1348078, 1348079, 1348080, 1348081, 1348082, 1348083, 1348084, 1348085, 1348086, 1348087, 1348088, 1348089, 1348090, 1348091, 1348092, 1348093, 1348094, 1348095, 1348096, 1348097, 1348098, 1348099, 1348100, 1348101, 1348102, 1348103, 1348104, 1348105, 1348106, 1348107, 1348108, 1348109, 1348110, 1348111, 1348112, 1348113, 1348114, 1348115, 1348116, 1348117, 1348118, 1348119, 1348120, 1348121, 1348122, 1348123, 1348124, 1348125, 1348126, 1348127, 1348128, 1348129, 1348130, 1348131, 1348132, 1348133, 1348134, 1348135, 1348136, 1348137, 1348138, 1348139, 1348140, 1348141, 1348142, 1348143, 1348144, 1348145, 1348146, 1348147, 1348148, 1348149, 1348150, 1348151, 1348152, 1348153, 1348154, 1348155, 1348156, 1348157, 1348158, 1348159, 1348160, 1348161, 1348162, 1348163, 1348164, 1348165, 1348166, 1348167, 1348168, 1348169, 1348170, 1348171, 1348172, 1348173, 1348174, 1348175, 1348176, 1348177, 1348178, 1348179, 1348180, 1348181, 1348182, 1348183, 1348184, 1348185, 1348186, 1348187, 1348188, 1348189, 1348190, 1348191, 1348192, 1348193, 1348194, 1348195, 1348196, 1348197, 1348198, 1348199, 1348200, 1348201, 1348202, 1348203, 1348204, 1348205, 1348206, 1348207, 1348208, 1348209, 1348210, 1348211, 1348212, 1348213, 1348214, 1348215, 1348216, 1348217, 1348218, 1348219, 1348220, 1348221, 1348222, 1348223, 1348224, 1348225, 1348226, 1348227, 1348228, 1348229, 1348230, 1348231, 1348232, 1348233, 1348234, 1348235, 1348236, 1348237, 1348238, 1348239, 1348240, 1348241, 1348242, 1348243, 1348244, 1348245, 1348246, 1348247, 1348248, 1348249, 1348250, 1348251, 1348252, 1348253, 1348254, 1348255, 1348256, 1348257, 1348258, 1348259, 1348260, 1348261, 1348262, 1348263, 1348264, 1348265, 1348266, 1348267, 1348268, 1348269, 1348270, 1348271, 1348272, 1348273, 1348274, 1348275, 1348276, 1348277, 1348278, 1348279, 1348280, 1348281, 1348282, 1348283, 1348284, 1348285, 1348286, 1348287, 1348288, 1348289, 1348290, 1348291, 1348292, 1348293, 1348294, 1348295, 1348296, 1348297, 1348298, 1348299, 1348300, 1348301, 1348302, 1348303, 1348304, 1348305, 1348306, 1348307, 1348308, 1348309, 1348310, 1348311, 1348312, 1348313, 1348314, 1348315, 1348316, 1348317, 1348318, 1348319, 1348320, 13483

Colour illustrations: Kriekenburg, Dorsal view, South Africa. Left column: *Coelenteridium aurum*, ventral view; *GINA*; *condiogenus calis* and *amita*. Scale bars = 100, 10 and 10  $\mu$ m. Right column: *Allophylus* *ambrosia* (dorsal view) in FNA and in FNA; *paraphysa* *a* *condiogenus calis* and *a* *Scale bar = 10  $\mu$ m*.

Reports of *Colletes* species or *Euplocaris* include: *C. capiti*, *C. deserti*, *C. eichmanni* (ranked 12–20  $\times$   $\pm$   $\mu$ m; Sydow & Sydow 1918), *C. laevis* and *C. glaucoscapula* (Damm et al. 2009; Farr & Rossman 2002). Only *C. glaucoscapula* (syn. *E. laevis*) was previously reported from *Euphorbia* in Africa (Jordge 1850; Grous et al. 2003). All these taxa form either colonies or mixed groups and are not closely related to *C. eichmanni*.

Typical *Salmonella* Wadsworth Caps. Production, Glaxo-Wellcome Research Center, in houses of *Carboxylic acid* (Friedrichs, 1999). Gen. 5012, U. 1000000 (GenBank: G1511-2141), *Salmonella* G1511-2142, 21620 - G1511-2143, US sequence GenBank: F177414, US sequence GenBank: F177777, 66, Mac-Base: M1805221

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