

Eight Species of *Chaetomium* New for Taiwan

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ABSTRACT: Eight species of the genus *Chaetomium* are recorded as new for Taiwan. They are *Chaetomium chiversii* (J. C. Cooke) Carter, *C. convolutum* Chivers, *C. cupreum* Ames, *C. flavigenum* van Warmelo, *C. gracile* Udagawa, *C. megalocarpum* Bainier, *C. seminudum* Ames, and *C. subaffine* Sergejeva, respectively. The morphological characteristics of these species are described.

KEY WORDS: Ascomycota, *Chaetomium*, Mycoflora, Taiwan.

INTRODUCTION

Chaetomium species are common in dry and warm areas on dung, straw, paper, textiles, seeds, plant debris, feathers of birds, soil and many other substrates (Arx, 1986), and are notable for their cellulolytic activities (Ames, 1963). Many species are of some importance because of their rotting of cordage, fabrics etc, particularly in tropical climates (Ames, 1963; Seth, 1970).

During our survey of *Chaetomium* species in Taiwan, the soil, dead twigs of trees, seeds and other samples such as molded papers, cardboards, chopsticks, toothpicks were collected from various locations of Taiwan. We found eight species of *Chaetomium* which had not been recorded for Taiwan. In this paper their morphological characteristics are described.

TAXONOMY

Chaetomium chiversii (J. C. Cooke) Carter, Beih. Nov Hedwigia 84: 19, 1986. Fig. 1

Chaetomium trilaterale Chivers var. *chiversii* J. C. Cooke, Mycologia 65: 1218, 1973.

Colonies with a daily growth rate of 3.1–3.9 mm, with a sparse and pale aerial mycelium and a pink or orange exudate; perithecia ostiolate, superficial, olivaceous grey in reflected light, spherical or ovate, (116.8-)128.6–141.4(-146.0) × (146.0-)148.4–161.7(-175.2) μm; ascumatal hairs relatively long, arcuate or undulate-circinate; asci clavate or obovate, stalked, 8-spored, evanescent; ascospores ellipsoid, usually asymmetrical or slightly curved, brown when mature, (4.5-)5.6–5.8(-6.0) × (7.5-)10.6–10.8(-12.0) μm.

Substrate: Soil.

Specimen examined: NTUCH-0134, from soil, Shinpu Jen, Hsinchu County, Taiwan, May. 13, 1984.

Chaetomium convolutum Chivers, Proc. Amer. Acad. 48: 85, 1912. Fig. 2

Chaetomium hydrabadense Salam & Nusrath, J. Indian Bot. Soc. 38: 543, 1960.

Chaetomium biapiculatum Lodha, J. Indian Bot. Soc. 43: 124, 1964.

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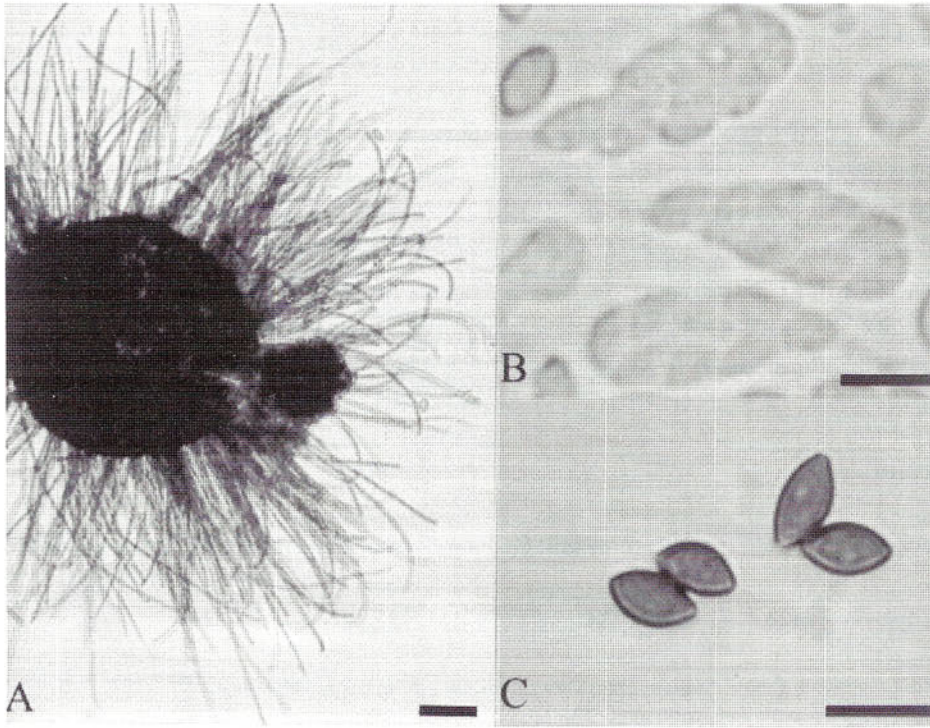


Fig. 1. *Chaetomium chiversii*. A. ascomata; B. asci with eight ascospores; C. ascospores. (A, bar = 50 μm ; B, C, bars = 12.5 μm)

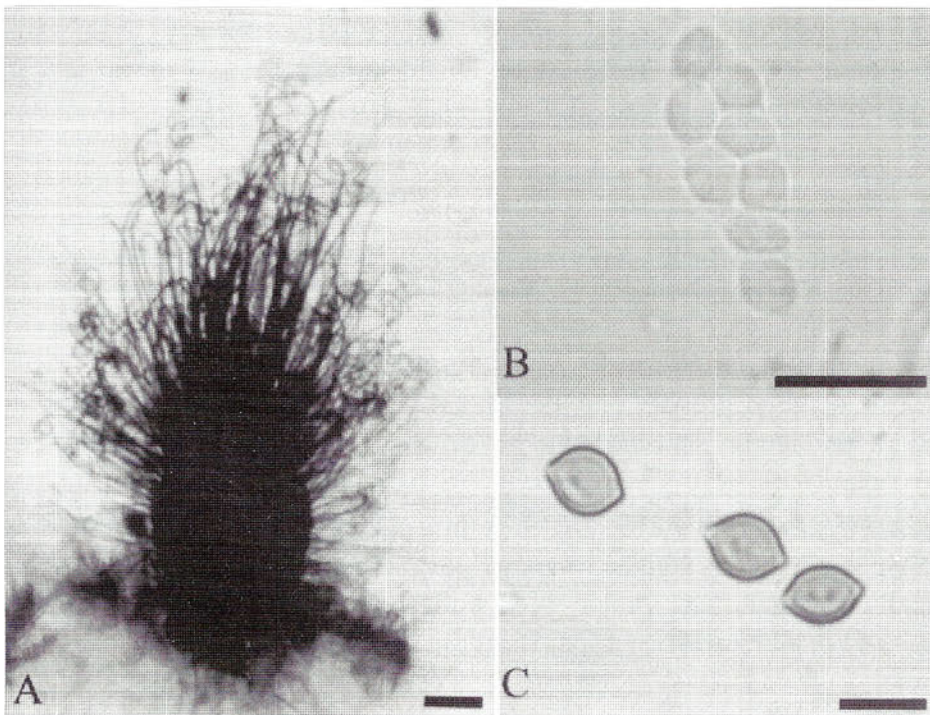


Fig. 2. *Chaetomium convolutum*. A. ascomata; B. an ascus with eight ascospores; C. ascospores. (A, bar = 100 μm ; B, bar = 25 μm ; C, bar = 12.5 μm)

Chaetomium concinnum Sörgel ex Seth, Beih. Nove Hedwigia 37: 52, 1972.

Chaetomium montblanchense Guarro et al, Nove Hedwigia 32: 207, 1980.

Colonies with a daily growth rate of 2.3–4.7 mm, without aerial mycelium, occasionally with pale green exudates; perithecia ostiolate, superficial, pale metallic or mouse grey in reflected light when young, grey when old, obovate, ovate turbinate or ampulliform, (160.0-)205.2–229.1(-262.8) × (219.0-)241.9–265.3(-277.4) μm; ascomatal hairs mainly arising from the apical collar, erect, in the upper part spirally coiled; asci fasciculate, numerous, clavate, 8-spored, evanescent; ascospores limoniform, slightly apiculate at both ends, bilaterally flattened, hyaline and dextrinoid when young, pale bluish grey when mature, darkened near the ends, (4.5-)6.1–6.1(-7.5) × (6.0-)8.6 × 8.85(-10.55) μm.

Substrate: Soil.

Specimen examined: NTUCH-0012, from soil, Fushing Shiang, Taoyuan County, Taiwan, Feb. 9, 1990.

***Chaetomium cupreum* Ames, 1949, Mycologia 41: 642.**

Fig. 3

Chaetomium rufum Ramakrishnan, Proc. Ind. Acad. Sci., B, 38: 118, 1953.

Chaetomium trilaterale var. *cupreum* (Ames) J. C. Cooke, Mycologia 65: 1218, 1953.

Colonies with a daily growth rate of 3.9–4.7 mm, often becoming red due to an exudate, with or without aerial hyphae; perithecia ostiolate, superficial, spherical or ovate, (87.6-)100.5–113.6(-116.8) × (87.6-)105.6–123.1(-116.8) μm; ascomatal hairs arcuate, epically circinate or coiled, red or orange-red (copper coloured) in reflected light; asci clavate, evanescent, 8-spored; ascospores reniform or lunate in face view, hyaline and dextrinoid when young, pale brown when mature, (3.0-)4.4–4.5(-6.03) × (7.5-)9.8–10.1(-10.6) μm.

Substrate: Soil.

Specimen examined: NTUCH-0007, from soil, Yuanshan Shiang, Ilan County, Taiwan, Feb. 6, 1990; NTUCH-0188, from soil, Shoufeng Shiang, Hualien County, Taiwan, Nov. 13, 1995.

***Chaetomium flavigenum* van Warmelo, Mycologia 58: 847, 1966.**

Fig. 4

Colonies with a daily growth rate of 3.6–4.0 mm, with a white aerial mycelium, becoming orange or "lemon chrome" due to exudates; reverse golden orange; perithecia ostiolate, superficial, dark gray-green in reflected light, spherical or ovate, (73.0-)113.8–120.4(-160.6) × (166.1-)116.8–180.2(-219.0) μm; ascomatal hairs arcuate, rather short, epically circinate; asci clavate, stalked, 8-spored, evanescent; ascospores broadly fusiform or navicular, usually asymmetrical, rather thick-walled and olivaceous brown when mature, (4.5-)5.7–5.8(-7.5) × (12.1-)14.2–14.4(-16.6) μm.

Substrate: Soil.

Specimen examined: NTUCH-0184, from soil, Shoufeng Shiang, Hualien County, Taiwan, Nov. 13, 1995.

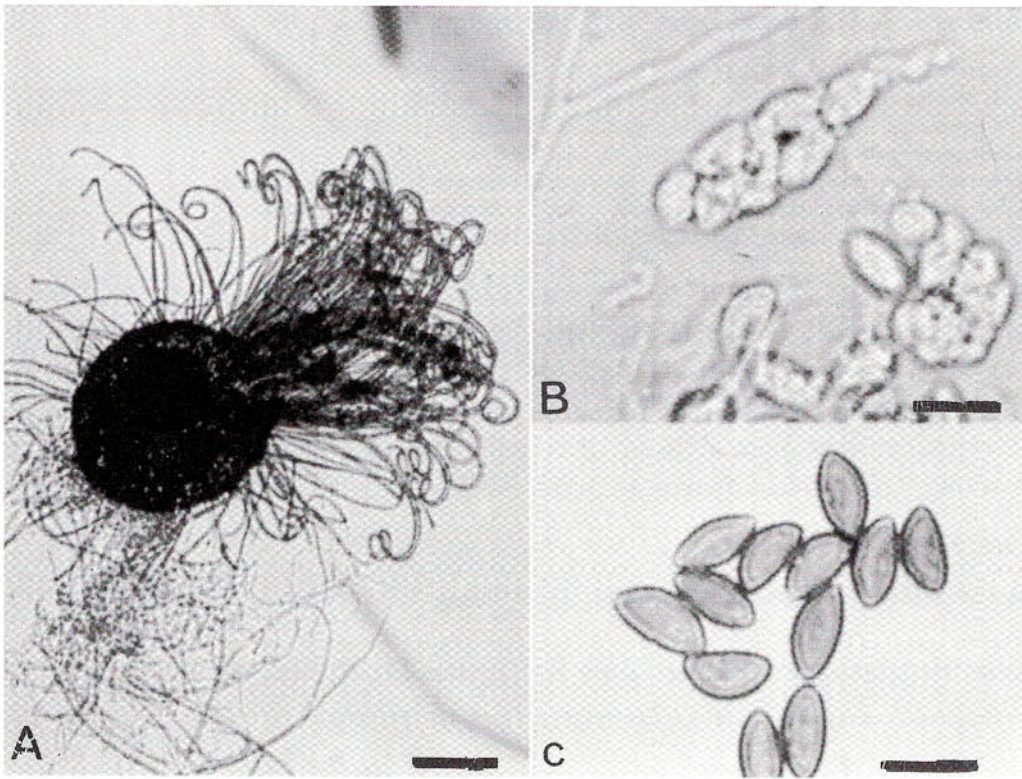


Fig. 3. *Chaetomium cupreum*. A. ascomata; B. ascus with eight ascospores; C. ascospores. (A, bar = 50 μm ; B, C, bars = 12.5 μm)

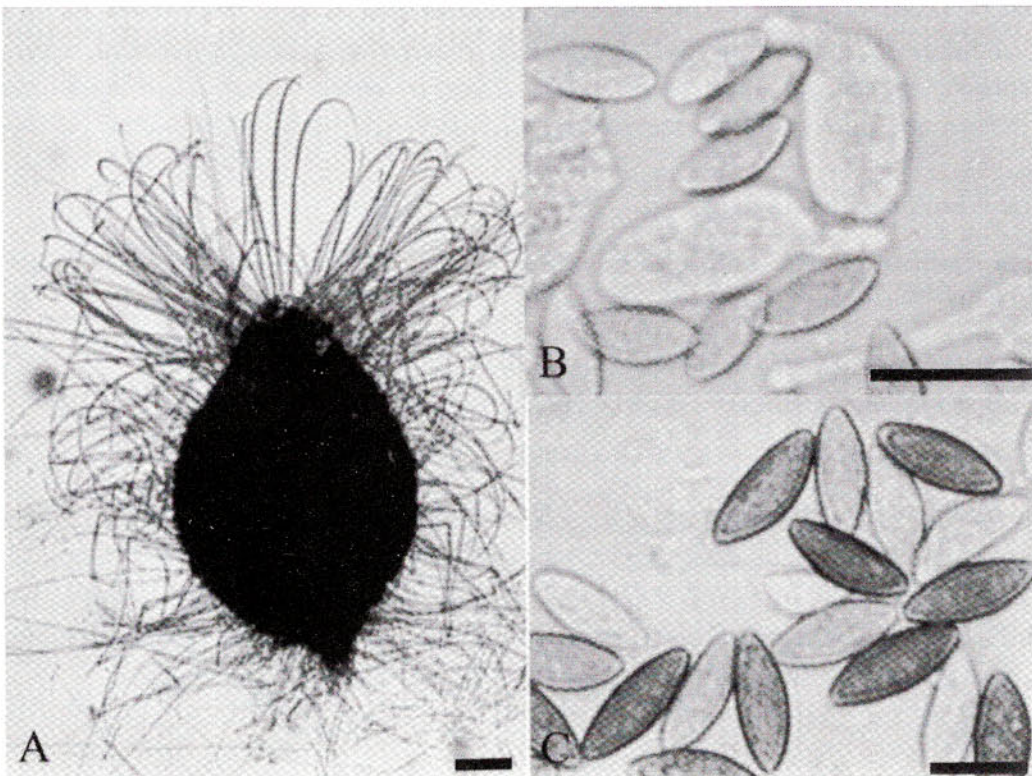


Fig. 4. *Chaetomium flavigenum*. A. ascomata; B. asci; C. ascospores. (A, bar = 100 μm ; B, bar = 25 μm ; C, bar = 12.5 μm)

Chaetomium gracile Udagawa, J. gen. appl. Microbiol. 6: 235, 1960.

Fig. 5

- Chaetomium arcuatum* Rai & Tewari, Can. J. Bot. 40: 1379, 1962.
Chaetomium terrestre Dwivedi, Indian Phytopath. 15: 219, 1963.
Chaetomium erraticum Ames, Monograph Chaetomiaceae p. 23, 1963.
Chaetomium orientum Saha, Sci. & Cult. 30: 351, 1964.
Chaetomium biostiolatum Roy & Bharadwaj, Sci. & Cult. 36: 557, 1970.
Chaetomium anatolicum Karaca & Turhan, J. Turkish Phytopath. 2: 97, 1973.
Chaetomium thielaviodeum Chen, Acta Microbiol. Sinica 13: 125, 1973.

Colonies with a daily growth rate of 2.4–3.3 mm, becoming green or yellow green due to an exudate, reverse green; perithecia ostiolate, superficial, olivaceous grey in reflected light, spherical or ovate, (87.6-)100.5–118.5(-116.8) × (102.2-) 115.9–133.1(-131.4) μm; ascomatal hairs surrounding mainly the opening, arcuate, partly undulate; asci clavate, stalked, 8-spored, evanescent; ascospore ellipsoid or broadly fusiform, attenuated at both ends, bluish grey when young, brown when mature, (4.5-)5.2–5.3(-6.0) × (12.1-)12.7–13.0(-13.6) μm.

Substrate: Soil.

Specimen examined: NTUCH-0330, from soil, Wulai Shiang, Taipei County, Taiwan, May. 14, 1992.

Chaetomium megalocarpum Bainier, Bull. Soc. mycol. Fr. 25: 202, 1910.

Fig. 6

Chaetomium atrosporum Skolko & Groves, Can. J. Bot. 31: 784, 1953

Colonies with a daily growth rate of 2.4–3.1 mm, often irregular and with a lobed margin and a white or pale aerial mycelium, occasionally with a pale green exudate; perithecia ostiolate, superficial, pale olivaceous or greyish brown in reflected light, spherical or ovate, (131.4-)167.6–204.7(-248.2) × (219.0-)278.7–312.6(-335.8) μm; ascomatal hairs long, flexuous, undulate or hypha-like; asci fasciculate, clavate or nearly cylindrical, with long stalks, 8-spored, evanescent; ascospores ovate, oblate or nearly spherical, often bilaterally flattened, brown and thick-walled when mature, (7.5-)8.9–8.9(-9.0) × (9.0-)9.07–9.1(-10.5) μm.

Substrate: Soil, cockroach dung.

Specimen examined: NTUCH-0032, from cockroach dung, Taipei County, Taiwan, Jul. 5, 1990; NTUCH-0049, from soil, Chiai County, Taiwan, Dec. 30, 1987.

Chaetomium seminudum Ames, Mycologia 41: 41, 1945.

Fig. 7

=*Farrowia seminudum* (Ames) D. Hawksworth, Persoonia 8: 181, 1975.

Chaetomium minulum Krzem. & Badura, Acta Soc. Bot. Poloniae 23: 747, 1954.

Colonies with a daily growth rate of 2.5–2.9 mm, with a floccose, white, aerial mycelium; perithecia ostiolate, superficial, dark grey or black in reflected light, pyriform or ampulliform, (116.8-)122.6–135.9(-306.6) × (219.0-)249.2–284.8 (-306.6) μm; asci clavate, stalked, evanescent, 8-spored; ascospores limoniform, at both ends umbonate or apiculate, bilaterally flattened, brown when mature, (4.5-)4.6–4.6(-6.0) × (6.0-)6.1–6.2(-7.5) μm.

Substrate: Soil.

Specimen examined: NTUCH-0195, from soil, Shoufeng Shiang, Hualien County, Taiwan, Nov. 13, 1995.

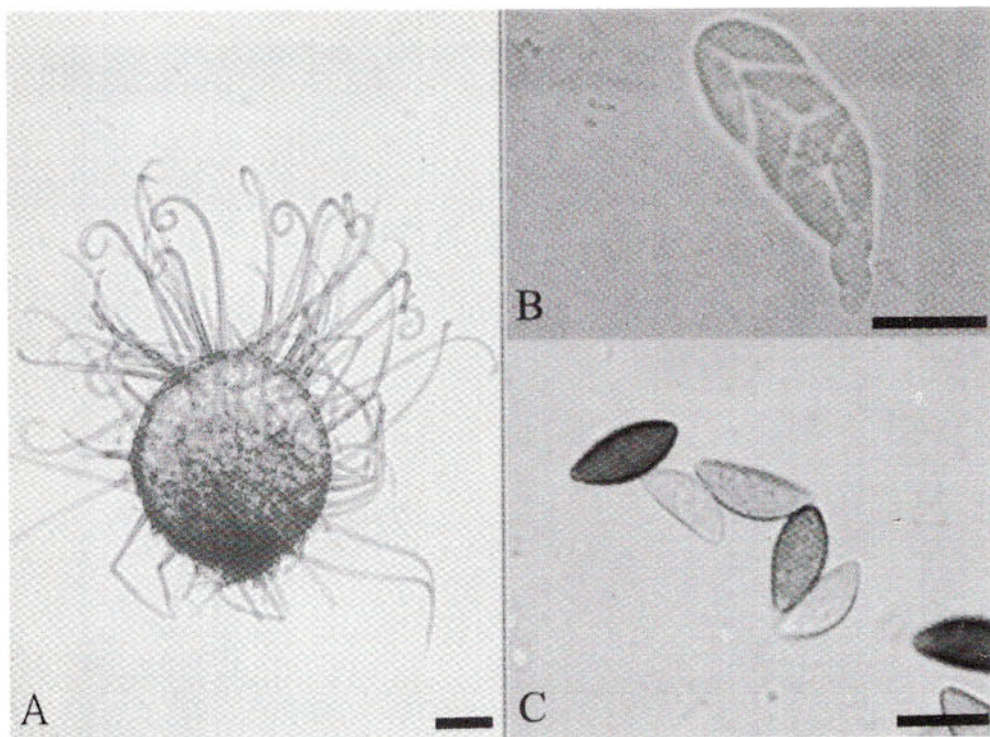


Fig. 5. *Chaetomium gracile*. A. ascomata; B. an ascus with eight ascospores; C. ascospores. (A, bar = 50 μm ; B, bar = 25 μm ; C, bar = 12.5 μm)

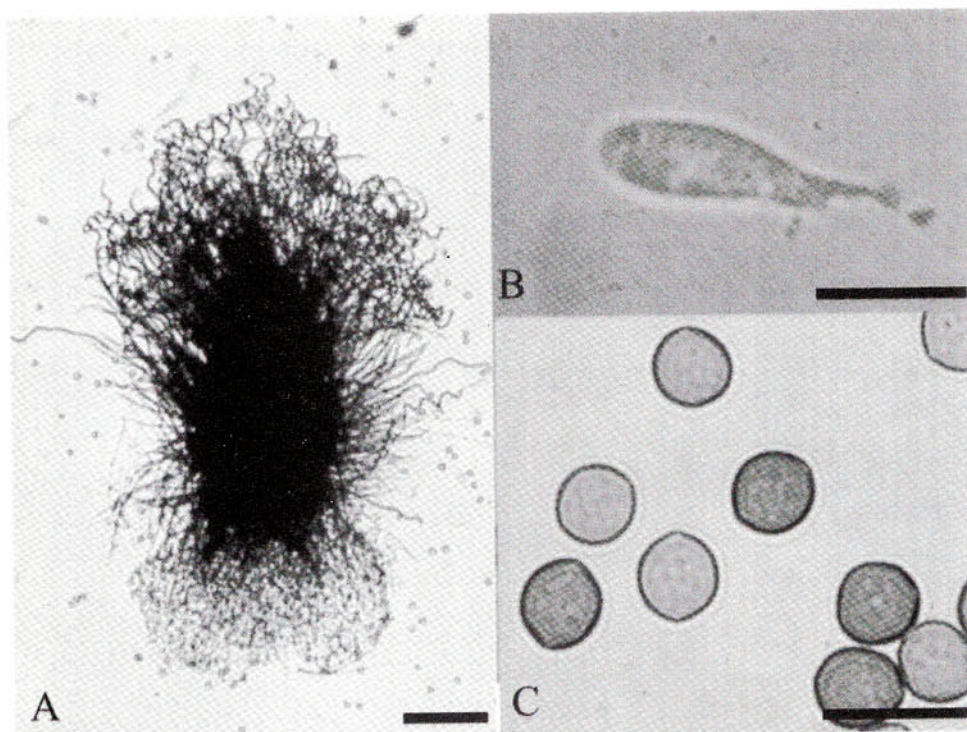


Fig. 6. *Chaetomium megalocarpum*. A. ascomata; B. ascus; C. ascospores. (A, bar = 100 μm ; B, C, bars = 25 μm)

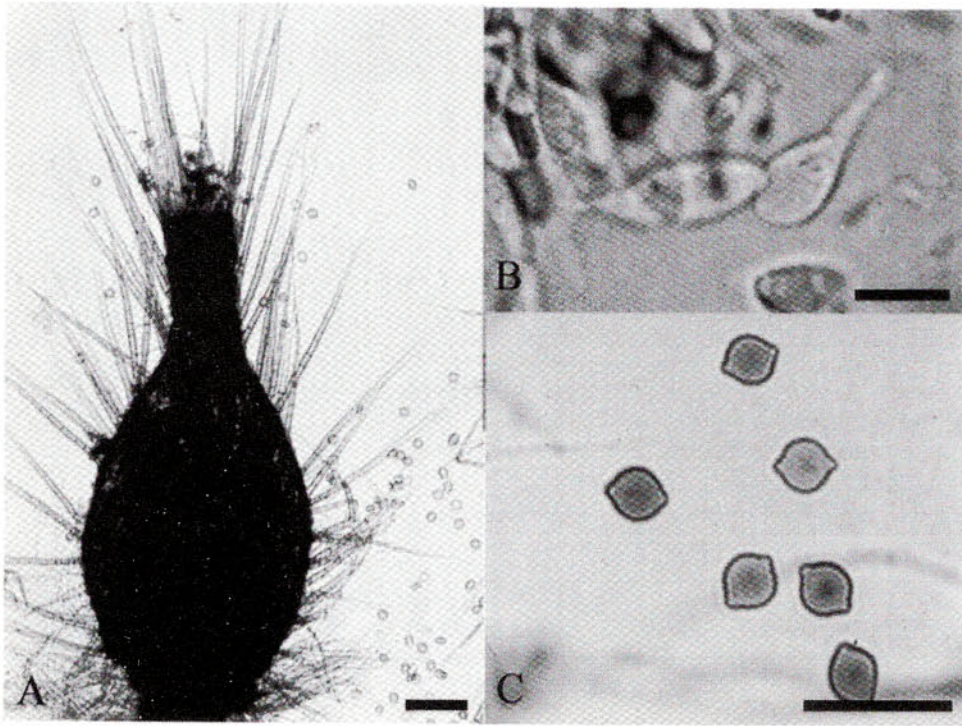


Fig. 7. *Chaetomium seminudum*. A. ascomata; B. asci; C. ascospores. (A, bar = 50 μm ; B, bar = 12.5 μm ; C, bar = 25 μm)

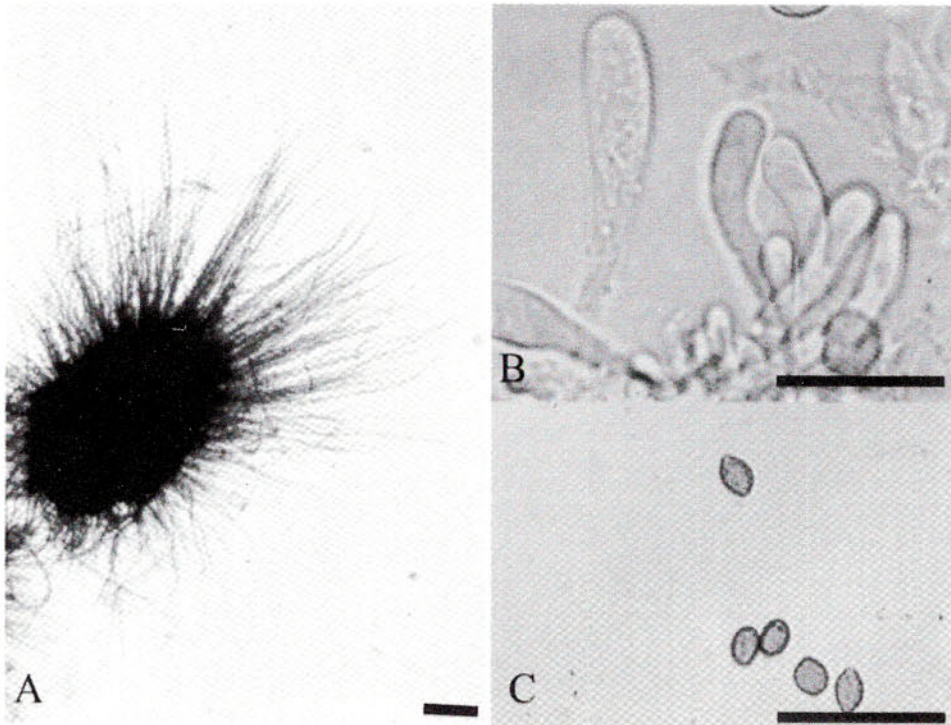


Fig. 8. *Chaetomium subaffine*. A. ascomata; B. ascus; C. ascospores. (A, bar = 100 μm ; B, C, bars = 25 μm)

Chaetomium subaffine Sergejeva, Not. Syst. sect. Crypt. Inst. Bot. Acad. Sci. U. S. S. R. 14: 148, 1961. Fig. 8

Colonies with a daily growth rate of 5.2–5.6 mm, without coloured exudates, with a grey or pale brown aerial mycelium; perithecia ostiolate, superficial, dispersed, pale olivaceous in reflected light, obovate or ovate, (146.0-)187.1–255.7(-292.0) × (219.0)287.3–374.5 (-438.0) μm; ascomatal hairs numerous, flexuous or undulate, unbranched, long; asci fasciculate, clavate or fusiform, stalked, 8-spored, evanescent; ascospores limoniform, biapiculate, bilaterally flattened, brown and rather thick-walled when mature, (6.0-)7.5–7.6(-7.5) × (9.0-)9.7–9.9(-10.5) μm.

Substrate: Cockroach dung, soil.

Specimen examined: NTUCH-0246, from cockroach dung, Taipei County, Taiwan, Aug. 14, 1995.

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八種臺灣新紀錄之毛殼菌

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摘 要

本文報導在臺灣首次發現之八種毛殼菌新紀錄種，它們分別是 *Chaetomium chiversii* (J. C. Cooke) Carter、*C. convolutum* Chivers、*C. cupreum* Ames、*C. flavigenum* van Warmelo、*C. gracile* Udagawa、*C. megalocarpum* Bainier、*C. seminudum* Ames 以及 *C. subaffine* Sergejeva。

關鍵詞：子囊菌、毛殼菌、真菌誌、台灣。

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