Botanical Studies (2006) 47: 453-456.

A new species of *Piptocephalis* from Taiwan

Hsiao-Man HO*

Department of Science Education, National Taipei University of Education, No. 134, Sect. 2, Ho-Ping E. Rd., Taipei, TAIWAN, Reublic of China

(Received October 14, 2005; Accepted April 10, 2006)

ABSTRACT. *Piptocephalis graefenhanii,* isolated from forest soil in Taiwan, is described as new. It is characterized by rather delicate sporophores, globose head cells, two-spored merosporangia with the apical spore produced from the basal one, and spore masses remaining dry when mature.

Keywords: *Piptocephalis graefenhanii*; Taiwan; Zygomycetes.

INTRODUCTION

The genus *Piptocephalis* de Bary (Piptocephalidaceae, Zoopagales, Zygomycetes) contains approximately 20 species (Gräfenhan, 1998; Kirk et al., 2001), three of which have been reported in Taiwan (Ho, 2003, 2004). *Piptocephalis* species have sporophores that are dichotomously branched several times. A sterile deciduous head cell is usually produced distally. Many merosporangia are born on the head cell. The number of spores contained within a merosporangium is variable. The mature spores remain dry or are enclosed in a liquid drop (Kirk, 1978). Species of *Piptocephalis* are obligate parasites of other fungi mainly in the Mucorales. The known habitats include dung, soil, and leaf litter.

A *Piptocephalis* species isolated from a soil sample collected in Taiwan has features much like those of *P. richardii* Baijal & B. S. Mehrotra (Gräfenhan, 1998). *Piptocephalis richardii* was first introduced by Baijal and Mehrotra (1968), who apparently did not intend to describe it but merely mentioned that the name would be published later by Dr. R. K. Benjamin. Gräfenhan (1998), while revising the genus *Piptocephalis* in his M.S. thesis, adopted *P. richardii* for a species resembling my Taiwan fungus. To my knowledge, *P. richardii* has never been validly published and only exists as a *nomen nudum*. I thus propose a new name *P. graefenhanii* for the Taiwan isolate to recognize Gräfenhan's contribution to the genus *Piptocephalis*.

MATERIALS AND METHODS

Soil samples were collected from Yangmingshan National Park, Taipei, and brought back to the laboratory in sterilized plastic bags. Two to three milligrams of soil particles were placed on 1.7% corn meal agar (Becton Dickinson) plates. The plates were incubated at 24ºC for nearly a week, before being observed under a dissecting microscope. Sporophores of *Piptocephalis* were transferred along with its host to fresh corn meal agar plates and incubated at 24ºC. After one week, the mature spores of *Piptocephalis* were transferred again by touching mature sporangia with a sterilized needle to pre-marked spots on fresh corn meal agar plates. A day after inoculation of *Piptocephalis* sporangia, the spores of the host were inoculated in the vicinity of the parasite. After 4-7 days, the host was parasitized by the *Piptocephalis*.

Pertinent materials were selected for SEM studies using a dissecting microscope and fixed for 1 h with 2.5% glutaraldehyde in distilled water, and then post-fixed for 1 h with 1% osmium tetraoxide in distilled water. The specimens were washed with distilled water and dehydrated in a graded acetone series. Specimens were dried in a critical point dryer, coated with gold, and observed with a Hitachi S-520 scanning electron microscope (SEM) at 20 KV.

TAXONOMY

Piptocephalis graefenhanii H.-M. Ho, sp. nov.

Figures 1-2

Hyphae vegetativae plerumque submersae, hyalinae. Sporophora erecta vel ascendentia, laevia, postea prostrata et distanter septata; stipites principales 900-4000 µm longi, 2.5-5 µm lati, dichotomis successivis usque ad septem praediti; rami basiles 600-2000 × 2.5-5 µm; rami paenultimi 8-25 × 1.3-1.5 µm; rami termiles 6-18 × 1 µm. Cellulae capituli deciduae, globosae, projecturis conicis, (2-)3-5(-6) µm diam, merosporangis 3-15 praeditae. Merosporangia bispora, spora apicali e spora basili inflata. Sporangiosporae ellipsoideae, laeves, hyalinae, (4-)5-6(-7)

*Corresponding author: E-mail: ho@tea.ntue.edu.tw; Tel: +886-2-27321104 ext. 3319; Fax: +886-2-27375419.

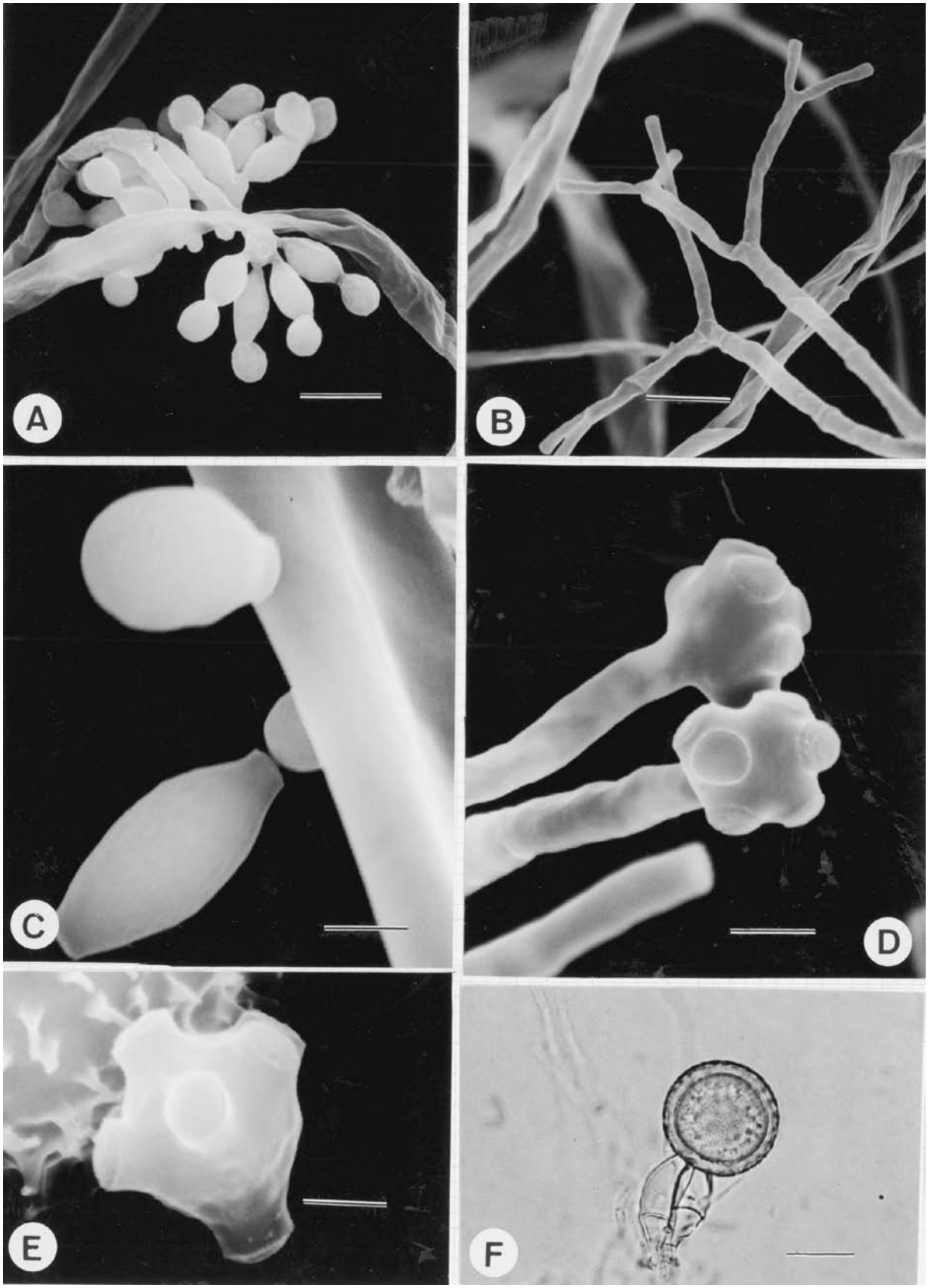

Figure 1. *Piptocephalis graefenhanii.* A-E, SEM; F, LM. A, Distal end of sporophores showing head cells bearing merosporangia. Bar = 5.0 μm; B, Ultimate branch of a sporophore after the head cells and merosporangiospores are detached. Bar = 6.0 μm; C, Two detached merosporangiospores. Bar = 1.5 μm; D, Terminal portion of two sporophores each bearing a head cell. Bar = 1.5 μm; E, A detached head cell. Bar = 1.0 μm; F, A zygospore with two suspensors. Bar = 20 μm.

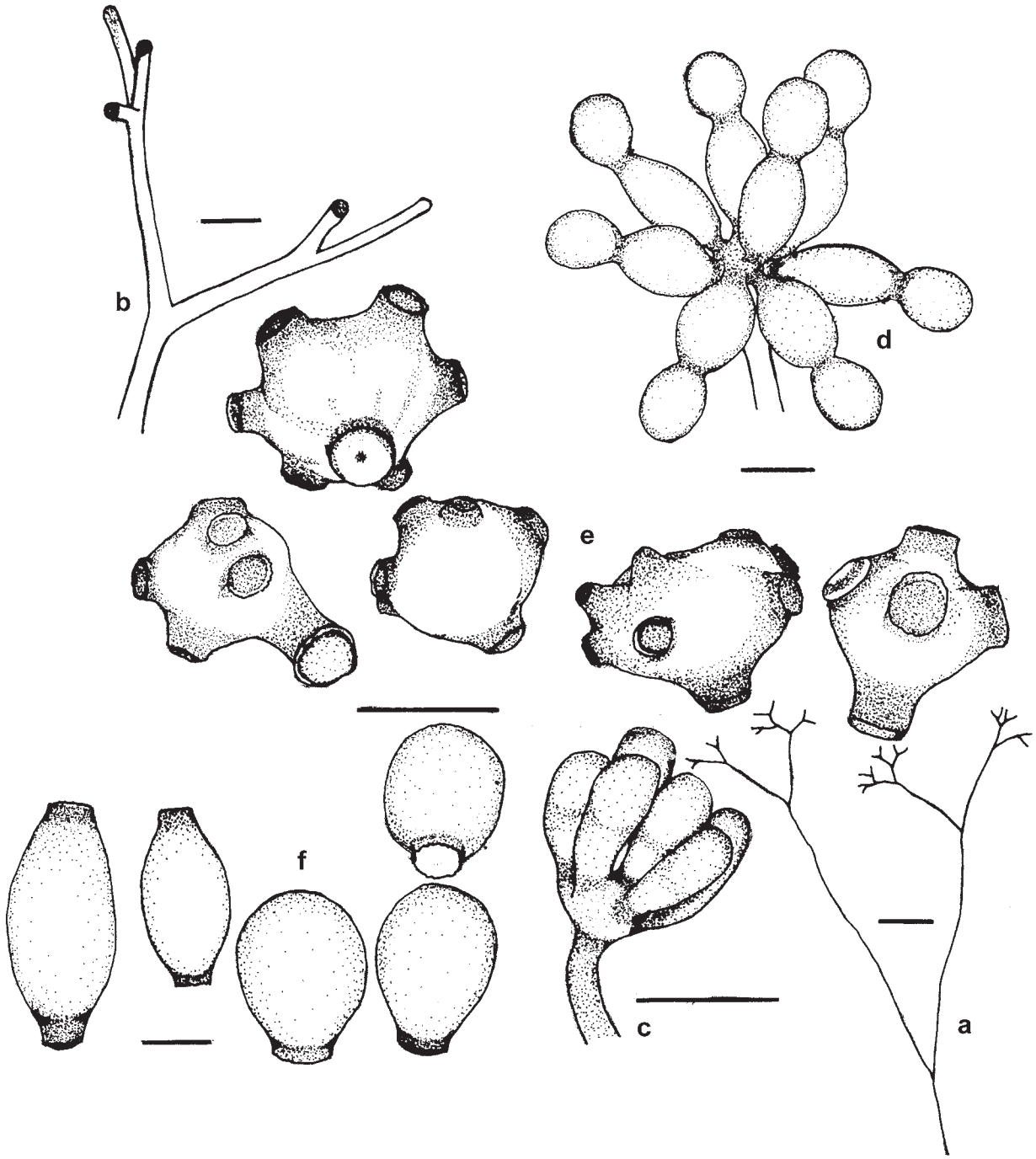

Figure 2. *Piptocephalis gaefenhanii.* a. Terminal portion of a typical sporophore. Bar = 0.1 mm; b, Ultimate branches after the head cells are detached. Bar = 5.0 µm; c, Terminal portion of an ultimate branch bearing young merosporangia. Bar = 4.3 µm; d, Apex of an ultimate branch bearing mature merosporangia. Bar = 2.5 µm; e, Detached head cells. Bar = 3.0 µm; f, Detached merosporangiospores. Bar = 1.35 µm.

× 3-4(-4.8) µm, massis sporae siccis ad maturitatem persistentibus. Zygosporae super vel sub pagina agari factae, globosae, verrucosae, 33-37 µm diam, brunneolae, suspensoribus septatis 22.5-27.5 × 12.5-13.8 µm.

Vegetative hyphae usually submerged, hyaline. Sporophores erect or ascending, smooth-walled, becoming prostrate and distantly septate with age; main stalks 900-4000 µm long, 2.5-5 µm wide, bearing up to seven successive dichotomies; basal branches 600-2000 × 2.5-5 µm; penultimate branches 8-25 × 1.3-1.5 µm; terminal branches 6-18 × 1 µm. Head cells deciduous, globose with conical projections, (2-)3-5(-6) µm diam, bearing 3-15 merosporangia. Merosporangia two-spored, with the apical spore budding from the basal spore. Sporangiospores ellipsoidal, smooth-walled, hyaline, (4-)5-6(-7) × 3-4(-4.8) µm, spore masses remaining dry at maturity. Zygospores

formed on or under the surface of agar media, globose, roughened, 33-37 µm diam, light brown, with septate suspensors 22.5-27.5 × 12.5-13.8 µm.

Holotype. **TAIWAN.** Taipei City, Yangmingshan National Park, Apr 2000, from humus, H.-M. Ho, Symwt 0103 (TNM F18433), the living culture deposited at BCRC.

Etymology. To recognize Gräfenhan's contribution to the genus *Piptocephali*s.

Commentary. This species is characterized by delicate sporophores, globose head cells, and two-spored sporangia. The apical spore buds from the basal one. *Piptocephalis lepidula* (Marchal) R. K. Benjamin appears closely related to this species, but differs in having more robust, distinctly striated sporophores and narrower sporangiospores.

Acknowledgements. This study was supported by Grant NSC92-2621-B-152-001 from the National Science Council, Taiwan, ROC. The author is grateful to Dr. Yu-Ming Ju of the Institute of Plant and Microbial Biology, Academia Sinica, Taipei for his kindly reviewing and giving suggestions on the manuscript.

LITERATURE CITED

Baijal, U. and B.S. Mehrotra. 1968. An interesting species of *Piptocephalis*. Zentralbl. Bakteriol. Hyg., 2. Abt. **122:** 181-184.

Gräfenhan, T. 1998. Taxonomic revision of the genus *Piptocephalis* (Fungi). Master's thesis. Mathematisch-Naturwissenschaftlichen Fakultät der ernst-Moritz-Arndt-Universiät. Greifswald, Germany, 102 pp.

Ho, H.-M. 2003. The Merosporangiferous Fungi from Taiwan (III): Three New Records of Piptocephalidaceae (Zoopagales, Zygomycetes). Taiwania **48:** 53-59.

Ho, H.-M. 2004. The Merosporangiferous Fungi from Taiwan (IV): Two New Records of *Piptocephalis* (Piptocephalidaceae, Zoopagales). Taiwania **49:** 188-193.

Kirk, P.M. 1978. A new and unuaual species of *Piptocephalis* (Mucorales). Trans. Brit. Mycol. Soc. **70:** 335-340.

Kirk, P.M., P.F. Cannon, J.C. David, and J.A. Stalpers (eds.). 2001. Dictionary of the fungi. 9th. ed. CABI International, Wallingford, UK, 655 pp.

台灣產一新種頭珠黴菌

何小曼

國立台北教育大學自然科學教育系

本文描述與圖示一新種頭珠黴菌 *Piptocephalis graefenhanii*，是由陽明山國家公園土壤分離得到，此種的特徵包括孢子囊柄纖細、頭細胞圓形、孢子囊孢子數目為兩個及末端孢子由基部孢子出芽而形成。

關鍵詞：葛拉芬頭珠黴；台灣；接合菌綱。