

## BRIEF ARTICLE

### A NEW SPECIES OF *THECOTHEUS* (PEZIZALES) FROM TAIWAN

YEI-ZENG WANG

*National Museum of Natural Science, Taichung,  
Taiwan, Republic of China*

AND

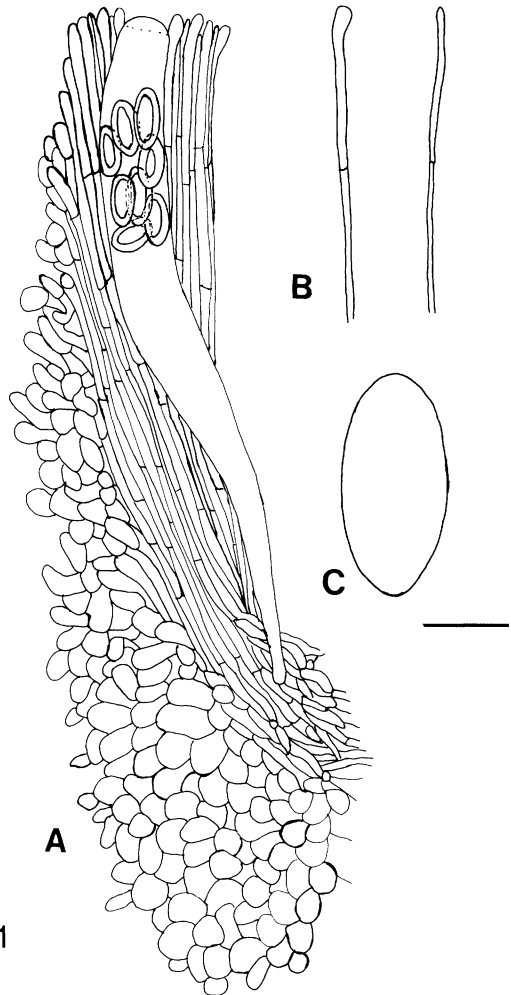
JAMES W. KIMBROUGH

*Plant Pathology Department, University of Florida,  
Gainesville, Florida 32611*

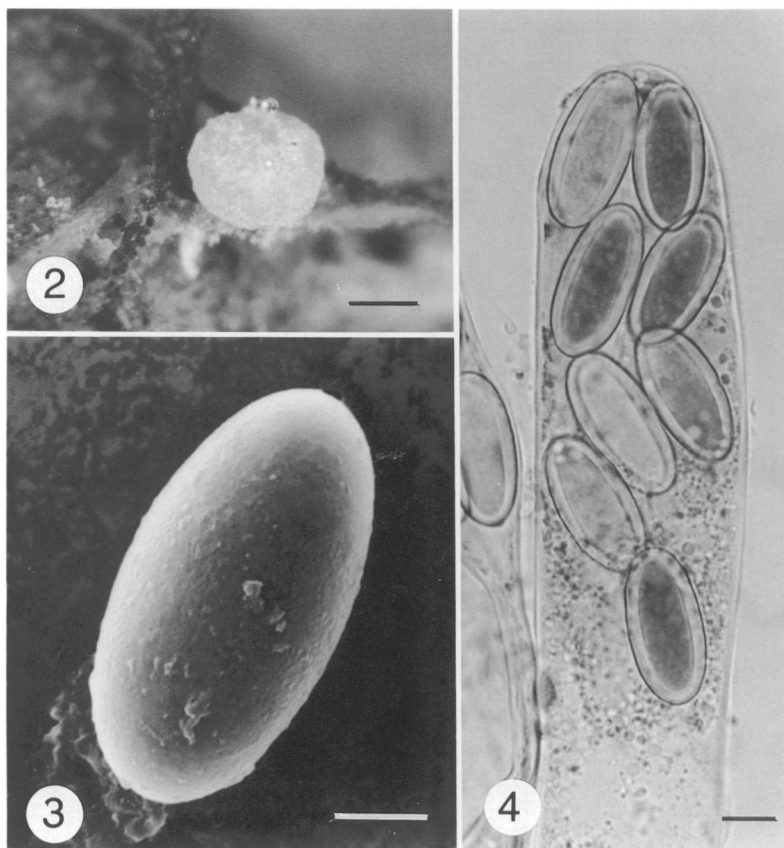
In revising the North American species of *Thecotheus* Boud., Kimbrough (1969) recognized five species. Subsequently, two noncoprophilous species, *T. rivicola* (Vaček) Kimbrough & Pfister, and *T. phycophilus* Pfister (1972, 1981), and four coprophilous species, *T. himalayensis* Kaushal (1980) from the western Himalayas, *T. africanus* Khan & Krug (1987) from East Africa, *T. perplexans* (Faurel & Schotter) Krug & Khan, and *T. harasisus* Gené, Elshafie & Guarro (1993) from the Sultanate of Oman, have been added to this genus. During investigations of the coprophilous fungal flora of Taiwan, a species of *Thecotheus* was collected from moist chamber culture of dung samples which appears to differ from all known species. Description of this species and a revised key, including all known *Thecotheus* species, are provided. The collections are deposited at National Museum of Natural Science, ROC.

***Thecotheus flavidus*** Y.-Z. Wang *et* Kimbrough,  
*sp. nov.* FIGS. 1–4

Apothecia primo globosa et alba, deinde doliiformescentia et brunneola, 0.1–1 mm in diam. Excipulum ectale textura globosa vel angulata compositum; excipulum medullare cum texturis intricatis. Asci octospori, iodo caerulescentes,  $220\text{--}310 \times 24\text{--}44 \mu\text{m}$  magni.



→  
FIG. 1. *Thecotheus flavidus* (Holotype) A. Cross section of an apothecium. B. Paraphyses tips, enlarged tip on the left and filiform one on the right. C. A mature ascospore. Scale bar =  $25 \mu\text{m}$  for A and B, and  $10 \mu\text{m}$  for C.



FIGS. 2–4. *Thecotheus flavidus* (Holotype). 2. An apothecium. scale bar = 300  $\mu\text{m}$ . 3. An ascospore (scanning electron micrograph). Scale bar = 6  $\mu\text{m}$ . 4. An ascus with eight ascospores stained in cotton blue. Scale bar = 10  $\mu\text{m}$ .

Ascosporae ellipsoideae, 28–32(–36)  $\times$  14–16  $\mu\text{m}$  magnaе, flavidae, laeves. Paraphyses cum parietibus tenuibus, filiformes 2–3  $\mu\text{m}$  in diam, aut apice tumidis 6–8  $\mu\text{m}$  in diam.

Apothecia at first turbinate and glistening white, becoming doliform and pale yellow, finally grayish tan, 0.1–1 mm in diam, 0.4–1 mm high. Disc white, mature asci protruding from hymenium. Ectal-excipular layer 30–80  $\mu\text{m}$  thick, of *textura globulosa* to *angularis*, composed of polygonal cells 12–40  $\times$  10–18  $\mu\text{m}$ , with pale yellow walls. Medullary excipular layer 60–100  $\mu\text{m}$  thick, of *textura intricata*, composed of thin walled hyphae 6–8  $\mu\text{m}$  in diam. Asci eight-spored, 220–310  $\times$  24–44  $\mu\text{m}$ , walls turning blue in Melzer's reagent, apex broad with a distinct thickened ring in Congo red. Ascospores ellipsoid, smooth, thick walled when young, pale yellow, 28–32(–36)  $\times$  14–16  $\mu\text{m}$  at maturity, with a mucilaginous peri-

sporic layer. Paraphyses of two types; one type filiform, 2–3  $\mu\text{m}$  in diam, the second type enlarged at the apex, 6–8  $\mu\text{m}$  in diam.

**HOLOTYPE.** TAIWAN: Taichung Co., Shengkang, on cow dung, 25 Sept. 1992, Y.-Z. Wang F0661 (National Museum of Natural Science).

**ETYMOLOGY.** Latinized from *flavidus* = yellowish, referring to the yellowish color of the ascospores.

**HABITAT.** On cow dung.

**SPECIMENS EXAMINED.** TAIWAN: Taichung Co., Shengkang, 19 Nov. 1992 Y.-Z. Wang F0662 (N.M.N.S.).

*Thecotheus flavidus* is characterized by smooth, yellowish ascospores and two types of paraphyses. It is similar to *T. phycophilus* in having smooth ascospores and two types of paraphyses. However, the apothecia of *T. flavidus* are smaller than those reported for *T. phycophilus*. The former is coprophilous, not phycophilous, and has eight-spored instead of four-spored asci as in the

latter. *Thecotheus himalayensis* also has two types of paraphyses but with smaller ( $12\text{--}15.5 \times 6\text{--}7 \mu\text{m}$ ) and verruculose ascospores. A newly reported species *T. harasisus* differs from *T. flavidus* by having apiculate and ornamented ascospores.

## KEY TO THE SPECIES

1. On herbaceous, lignicolous or terricolous substrata ..... 2
1. On coprophilous substrata ..... 4
  2. Ascospores apiculate; verruculose;  $17\text{--}22 \times 7\text{--}8\text{--}(9.5) \mu\text{m}$  ..... *T. rivicola* (Vaček) Kimbr. & Pfister
  2. Ascospores nonapiculate, smooth ..... 3
3. Asci usually four-spored, ascospores  $30\text{--}36 \times 15\text{--}16 \mu\text{m}$ , paraphyses of two types ..... *T. phycophilus* Pfister
3. Asci eight-spored, ascospores  $40\text{--}45 \times 15\text{--}20 \mu\text{m}$ , paraphyses of one type ..... *T. pallens* (Boud.) Kimbr.
  4. Ascospores nonapiculate ..... 5
  4. Ascospores apiculate ..... 8
5. Asci 32-spored, ascospores  $32\text{--}40 \times 20\text{--}24 \mu\text{m}$  ..... *T. pelletieri* (Cr. & Cr.) Boud.
5. Asci eight-spored ..... 6
  6. Ascospores verruculose, paraphyses of two types ..... *T. himalayensis* Kaushal
  6. Ascospores smooth, paraphyses of one or two types ..... 7
7. Apothecia purplish brown, ascospores  $20\text{--}22 \times 8\text{--}10 \mu\text{m}$ , paraphyses of one type ... *T. agranulosus* Kimbr.
7. Apothecia grayish tan, ascospores  $28\text{--}32\text{--}(36) \times 14\text{--}16 \mu\text{m}$ , paraphyses of two types ..... *T. flavidus* Wang & Kimbr.
  8. Ascospores with projecting collarettes ..... 9
  8. Ascospores without collarettes ..... 10
9. Apothecia yellowish, ascospores  $12\text{--}15 \times 7.5\text{--}9 \mu\text{m}$  ..... *T. africanus* Khan & Krug
9. Apothecia white, ascospores  $20\text{--}22 \times 10\text{--}12 \mu\text{m}$  ..... *T. perplexans* (Faurel & Schotter) Krug & Khan
  10. Ascospores smooth;  $16\text{--}20 \times 8\text{--}12 \mu\text{m}$  ..... *T. apiculatus* Kimbr.
  10. Ascospores punctate ..... 11
11. Apothecia lilaceous to purplish brown, ascospores  $30\text{--}42 \times 15\text{--}18 \mu\text{m}$  ..... *T. cinereus* (Cr. & Cr.) Chen.
11. Apothecia white to light yellow, ascospores  $23\text{--}28 \times 12\text{--}13.5 \mu\text{m}$  ... *T. harasisus* Gené, Elshafie & Guarro

The senior author thanks the colleagues at the National Museum of Natural Science, ROC; Miss C. M. Wang for assisting with collecting dung samples and Dr. S. H. Wu for making constructive comments. We thank Drs. Donald H. Pfister and John C. Krug for their reviews of this manuscript. This research was funded by National Science Council, ROC (NSC82-0211-B-178-007).

Key Words: Discomycetes, Pezizales, taxonomy, *Thecotheus*

## LITERATURE CITED

Gené, J., A. E. Elshafie, and J. Guarro. 1993. Two new coprophilous Pezizales from the Sultanate of Oman. *Mycotaxon* **46**: 275–284.

Kaushal, S. C. 1980. A new species of *Thecotheus* (Pezizales) from the western Himalayas. *Bot. Not.* **133**: 319–321.

Kimbrough, J. W. 1969. North American species of *Thecotheus* (Pezizales, Pezizaceae). *Mycologia* **61**: 99–114.

Krug, J. C., and R. S. Khan. 1987. A new species of *Thecotheus* from east Africa. *Mycologia* **79**: 200–203.

Pfister, D. H. 1972. The psilopezoid fungi. II. *Thecotheus rivicola* comb. nov. and other Iodophaneae (Pezizales) occurring on water-soaked wood. *Bull. Torrey Bot. Club* **99**: 198–200.

———. 1981. A new noncoprophilous species of *Thecotheus*, *T. phycophilus*. *Mycologia* **73**: 1001–1004.