

A new species of *Thecotheus* (Pezizales) from the Western Himalayas

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A new species, *Thecotheus himalayensis* Kaushal, is described. It is characterized by additional interascal elements in the hymenium and minutely warted ascospores. Anatomical features of *T. cinereus* (Cr. & Cr.) Chen., based on Indian collections are given. Ascospores of *T. pelletieri* (Cr. & Cr.) Boud. are found to be smaller than in American and Canadian collections.

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I agree with Korf (1972) in including *Thecotheus* Boud. in the tribe Iodophaneae of the family Ascobolaceae. In my opinion, the presence of amyloid asci, the simple excipular structure and small apothecia in *Thecotheus* point to its close relationship with Ascobolaceae and justify its inclusion in this family.

Three species, *T. himalayensis* Kaushal, *T. cinereus* (Cr. & Cr.) Chen. and *T. pelletieri* (Cr. & Cr.) Boud. were examined during the course of the present investigations.

T. cinereus was listed by Batra & Batra (1963) in their checklist of Indian Discomycetes as *Ascophanus holmskjoldii* Hans. The Indian collections of this species by Batra (PAN s.n.) and Waraitch (PAN 2094) contain clearly warted and prominently apiculate ascospores. According to Eckblad (1968), these collections should be treated under *Thecotheus holmskjoldii* (Hans.) Eckbl. As Brummelen (1967) found the spores of *T. cinereus* to be completely smooth, Eckblad (1968) accepted it as a species distinct from *T. holmskjoldii*. However, studies by Le Gal (1960, 1963) and Kimbrough (1969) amply indicate that *T. holmskjoldii* is conspecific with *A. cinereus*. This view is accepted in this work and the Indian collections are placed accordingly under *T. cinereus*.

Observations regarding anatomical features of the Indian collections of *T. cinereus* are added

here (Fig. 1 A): ectal excipulum up to 85 μm thick, a textura angularis, cells up to $25 \times 16 \mu\text{m}$, with their longitudinal axis somewhat perpendicular to the surface, outer few layers with smaller cells; medullary excipulum 100-125 μm thick, a textura globulosa-angularis, cells often hyphoid, up to 8 μm wide; hypothecium very much reduced, textura intricata.

T. pelletieri is a rare species in India. Two collections from the Western Himalayas (Batra s.n. and Waraitch 2166 at PAN) have greyish apothecia and smaller ascospores ($28-32 \times 14-17 \mu\text{m}$) than those reported from the American and Canadian collections ($32-40 \times 20-24 \mu\text{m}$) by Kimbrough (1969).

T. himalayensis was collected in the late autumn of 1971 and 1974. Usual fungal stain have been used to study the microfeatures in the field and in the laboratory. The collections are deposited at PAN.

Thecotheus himalayensis Kaushal sp. nov., Fig. 1 B-D

Holotypus: India, Dalhousie, Panjpula, in stercore caprarum, 28.8.1974, S. C. Kaushal 2625 (PAN). Paratypes: Dalhousie, Jandri Ghat, in stercore caprarum, 29.8.74, S. C. Kaushal 2632 (PAN) — Simla, Narkanda, 18.8.71, S. C. Kaushal 2412 (PAN).

Apothecia ad 2,5 mm diam., solitaria vel aggregata, sessilia vel brevistipitata, cupulata vel turbinata et raro

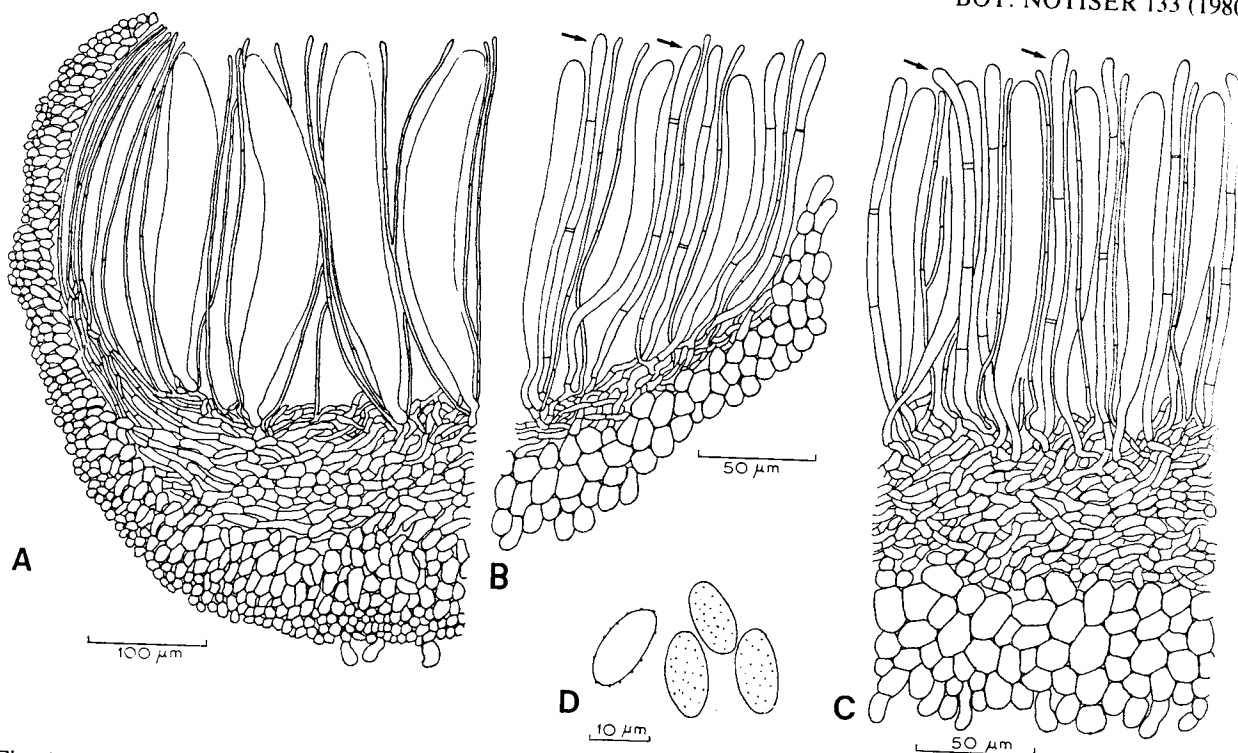


Fig. 1. A: *Thecotheus cinereus*. — B–D: *T. himalayensis*. — A, B: V.S. of the apothecium passing through its margin. — C: V.S. of the apothecium passing through its centre. — D: Ascospores. — Arrows in B and C show additional interascal elements.

conoidea, carnosa, alba, margine integro; hymenium album, asperum propter apices prominentes ascorum. Excipulum externum e textura angulari, ad $65\ \mu\text{m}$ crassum, cellulis ad $24 \times 17\ \mu\text{m}$, parum crassitunicatis; excipulum medullosum e textura intricata densa, ad $85\ \mu\text{m}$ crassum, tenuis ad marginem, hyphis ad $6\ \mu\text{m}$ latis; hypothecium indistinctum. Asci $(120\text{--})160\text{--}175\text{--}(186) \times 11\text{--}14\ \mu\text{m}$, octospori, cylindrici, apice rotundo, longe stipitati, J+. Ascosporae $12.0\text{--}15.5 \times 6\text{--}7\ \mu\text{m}$, uniseriatae, aliquando ad apicem congestae, ellipsoideae, subhyalinae, verruculosae. Paraphyses filiformes, septatae, ramosae, \pm rectae, deorsum ad $1.5\ \mu\text{m}$ crassae. Filamenta simplicia, robusta, \pm recta vel sursum paullo curvata, subhyalina, ad $5\ \mu\text{m}$ crassa ascis et paraphysibus immixta.

Apothecia up to 2.5 mm in diameter, gregarious, single to crowded (only 2–3 cups placed together), sessile or with a short thick stipe, shallow, cupulate to turbinate or rarely obconical, regular, fleshy; external surface white, smooth; margin entire; hymenium white, somewhat roughened by protruding ascus tips. Ectal excipulum a textura angularis, up to $65\ \mu\text{m}$ thick, with cells up to $24 \times 17\ \mu\text{m}$, usually more or less hyphoid at margin with clavate tips, slightly thick-walled; medullary excipulum a dense textura intricata, up to $85\ \mu\text{m}$ thick in the middle,

gradually reduced towards margin, with up to $6\ \mu\text{m}$ broad hyphae; hypothecium indistinct. Asci $(120\text{--})160\text{--}175\text{--}(186) \times 11\text{--}14\ \mu\text{m}$, 8-spored, cylindrical, apex rounded, base long and narrow, intensely J+ in fresh material (specially the young asci), slightly less in dry material. Ascospores $12.0\text{--}15.5 \times 6\text{--}7\ \mu\text{m}$, uniseriate, sometimes a few spores crowded near apex, ellipsoid, subhyaline, verruculose. Paraphyses up to $1.5\ \mu\text{m}$ wide below, very slightly enlarged above or not at all, thin-walled, filiform, septate, freely branched at various levels, straight or slightly bent. Interspersed between asci and paraphyses are additional interascal elements which are erect, paraphyses-like, up to $5\ \mu\text{m}$ broad, slightly narrow below, subhyaline, simple, stout, septate (septa at irregular intervals), straight or slightly bent at top.

The additional interascal elements described for the present species are not known anywhere else in operculates except in *Iodophanus kimbroughii* Thind & Kaushal (Thind & Kaushal 1978). However, such elements have been reported amongst inoperculates for *Lambertella acuminata* and *L. phaeoparaphysata* by Dumont

(1971). *T. himalayensis* is distantly related to *T. apiculatus* Kimbr. but the latter has larger asci and ascospores with very conspicuous apiculi.

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