5. THECOTHEUS HIMALAYENSIS Kaushal (Figs. 39 - 41)

Bot. Notiser 133: 319 (1980). -- Type: India, Himachal Pradesh, Dalhousie, Panjpula, on dung of goat, 28.VIII.1974 S. C. Kaushal 2625 (PAN, holotype, not seen).

ETYMOLOGY: Latinized from the name **Himalayas**.

Apothecia up to 2.5 mm in diameter in fresh condition, up to 1 mm in diameter and 0.4 mm high when dry, scattered to gregarious, often with 2-3 fruit-bodies placed close together, sessile or with a short, subimmersed tapering base. The apothecia are cupulate to turbinate, occasionally doliiform, rarely obconical, becoming discoid at maturity, regular, fleshy, external surface white, smooth at first, later slightly white-furfuraceous, concolorous with the disc. **Disc** at first white, after drying grey-orange (6B4) to grey-red (7B3), in most cases with a slightly reddish tint, somewhat roughened by the protruding ascal tips. **Margin** entire. **Hymenium** up to 170 µm thick.

Medullary excipulum about 90 µm thick at the central growing part, gradually reduced towards margin, composed of a more or less dense textura intricata with up to 6 µm broad hyphae, interspersed with small subglobose to somewhat elongated cells. **Ectal excipulum** about 70 µm thick, composed of a textura angularis, with polyhedral, slightly elongated cells up to 24 x 17 µm, their longitudinal axes lying somewhat perpendicular to the outer surface; usually more or less hyphoid cells with clavate tips at the margin and towards the exterior part, the latter cells slightly thick-walled.

Asci 8-spored, cylindrical, with apex slightly acute and base long and narrow, (120-) 140 - 175 (-185) x 11 - 14 µm, when fresh deep blue in their entire length in Melzer's reagent; young asci slightly less blue in dry material. **Ascospores** sub-ellipsoid to narrowly ellipsoid or subfusiform, slightly inequilateral, obliquely uniseriate, sometimes biseriate with a few spores crowded near apex, (12 -) 14 - 16 x (5.5 -) 6 - 7 µm, x = 15.30 x 6.44 (n = 45), Q = 0.77 (length), 0.25 (width), non-apiculate, ornamented with very fine verrucae; each ascospore surrounded with a gelatinous layer which stains in Cotton blue and in Congo red, and after spore liberation is only occasionally observed. **Paraphyses** up to 1.5 µm wide below, very slightly enlarged above up to 2 - 2.5 µm, or not at all enlarged above, this part with light yellow, slightly granulated content, 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 7 µm broad, slightly narrower below, grey-yellow (4B3) to light grey-orange (5B3), simple, stout, septate at irregular intervals, straight or slightly bent at their apices.

Specimens examined:

POLAND. Bialystok: Bialowieza Park Narodowy, deer dung, (mc), 5.IX.1966 L. Holm (UPS). New to Europe.

INDIA. Himachal Pradesh: Dalhousie: Panchpula, on goat dung, 28.VIII.1974 S. Chander 2625 (FLAS F 50920). -- Mahasu: Narkanda: Simla, on dung of goat [or a cervid species], 18.VIII.1971 S. Chander 2412 (FLAS F 50929); in Thind, Kaushal & Kaushal (1978: 67). Also Coprotus lacteus is found. The substrate is not cow dung as said by the authors.

UNVERIFIED RECORDS: **INDIA**. **Himachal Pradesh**, Kaushal 1980: 319, three collections, holotype and paratypes (2 goat, one unnamed substrate).

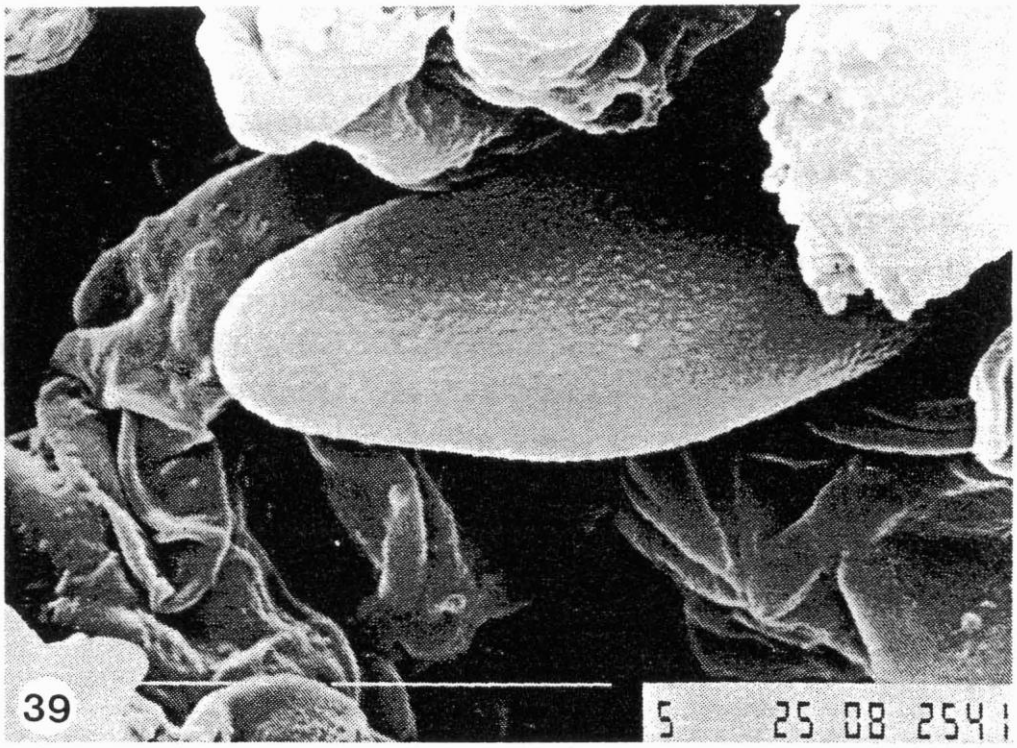
HABITAT AND SUBSTRATE PREFERENCE: on dung of goat 2 (4), deer 1, and unspecified dung (1). Very probably all collections from India are from dung of goat or a cervid species.

DISTRIBUTION: Only known from Poland and India. Tentatively, the species has an European-Asian disjunctive distribution pattern.

ILLUSTRATIONS: Kaushal 1980, fig. 1 B-D.

Thecotheus himalayensis is well characterized by its small, verruculose ascospores not furnished with apiculi. They are slightly smaller than those of T. viridescens. However, the latter species has a different spore ornamentation and usually only 4 spores in the asci. Another distinctive feature of T. himalayensis is the additional interascal elements interspersed between the asci and the paraphyses (Kaushal 1980). Such interascal elements are also found in other species of Thecotheus, otherwise they are probably not known in the Pezizales except in Iodophanus kimbroughii (Thind & Kaushal 1978).

It has not been possible to examine material of the holotype and the paratypes of T. himalayensis (Kaushal 1980) from the herbarium at PAN. However, two collections of Thecotheus sp. in the herbarium at FLAS belong to T. himalayensis. One of them, Chander 2625 (FLAS F 50920) was collected at the same time, at the same place and on the same kind of substrate as that of holotype of T. himalayensis. Moreover, it also has the same collecting number as the holotype. The other collection, Chander 2412 (FLAS F 50929), accords to one of the paratypes of T. himalayensis. Both capsules are imprinted "Botany Department Panjab University Chandigarh (India)" in addition to "U. S. D. A., P. L 480 Project", i.e. the same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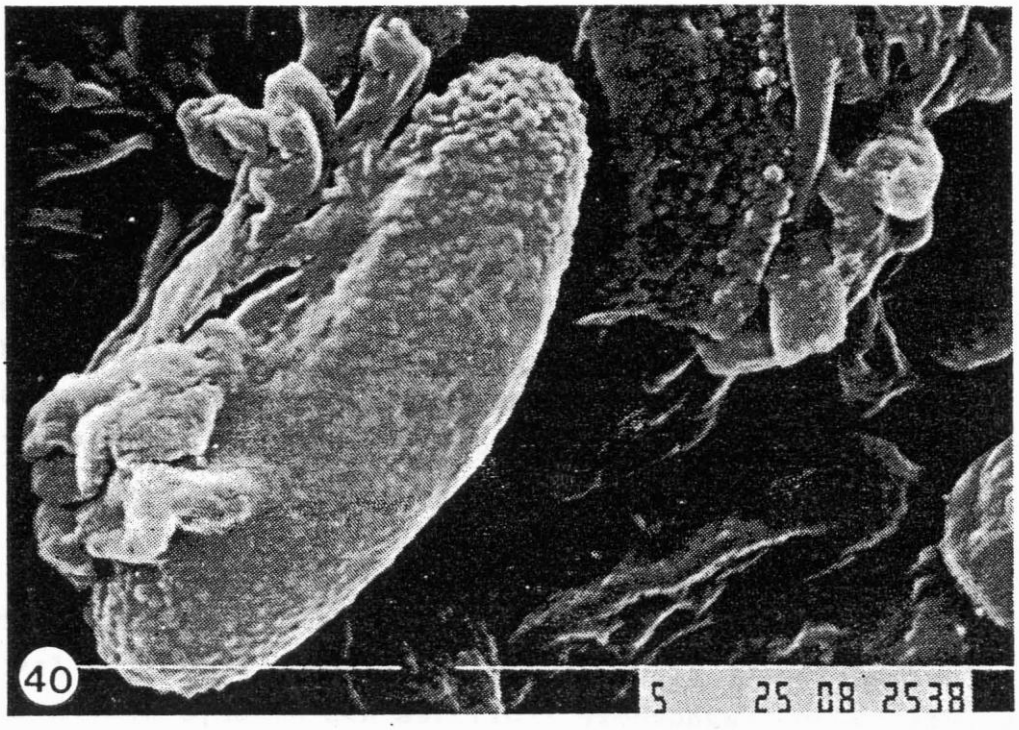
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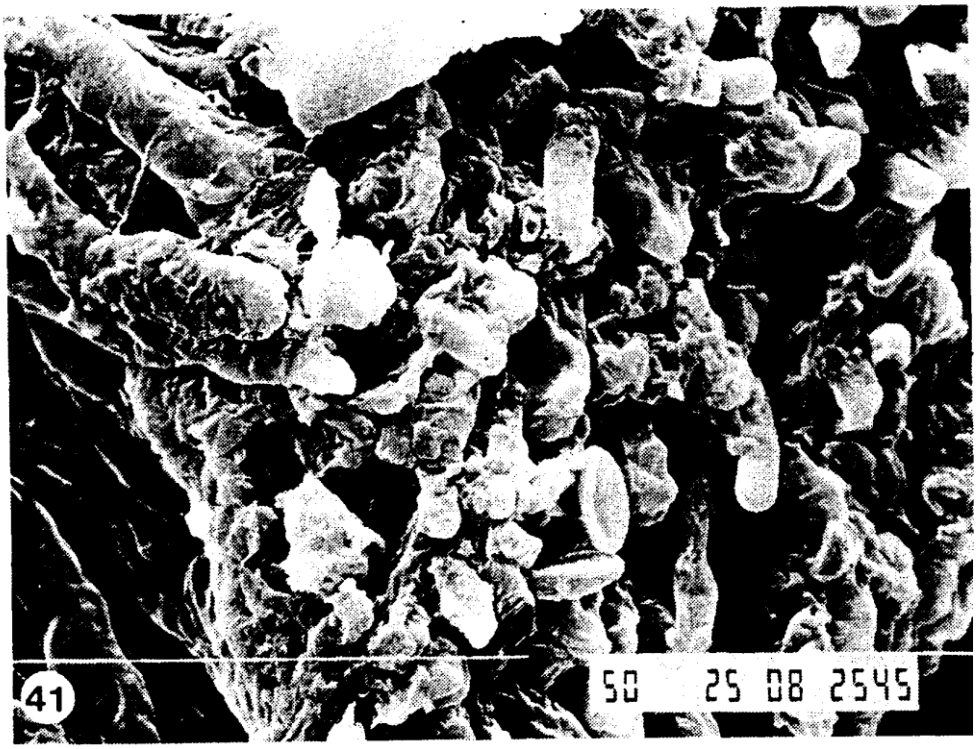

programme mentioned in Kaushal (1980). Thus, very probably both collections of Chander were collected simultaneously with those of Kaushal's.

Figs. 39 - 41. Thecotheus himalayensis. **39:** Chander 2625 (FLAS F 50920). SEM photo of ascospore with subfusiform shape. **40 - 41:** Chander 2412 (FLAS F 50929) **40:** SEM photo of ascospore showing ornamentation of very small ± subglobose warts. **41:** SEM photo showing tips of interascal elements. To the left a bunch of asci with spores inside. Scales: 39 - 40: 5 µm. 41: 50 µm. All photos: