

SOME COPROPHILOUS ASCOMYCETES FROM CHILE

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A new genus and species of Xylariaceae, *Ascotrichella hawksworthii*, and a new species of *Trichobolus*, *T. vanbrummelenii*, are described from unknown bird dung in Chile.

During a visit to Chile by Drs A. T. Martínez and A. F. González of the Biological Research Centre of the Higher Council for Scientific Research, Madrid, during May and June 1986, in which wood decomposition in the Valdivian forest of South Chile was studied, several dung samples from different animal species were collected and kindly sent to our laboratory for examination. Several Ascomycetes fruited on those specimens as well as two interesting species which we were not able to assign to any known taxon, and which we consider to be undescribed.

There are to date few studies on coprophilous fungi of the southern hemisphere and of Chile specifically (Spegazzini, 1921; Piontelli, Toro Santa-maria & Caretta, 1981; Udagawa, 1980; Muroi & Udagawa, 1984).

***Ascotrichella* Valldosera & Guarro gen. nov.**

Etym.: similar to *Ascotricha* Berk.

Ascomata late ovoidea vel subglobosa, superficialia, ostiolata, pilosa, atrobrunnea vel nigra; peridium membranaceum, pseudoparenchymaticarum, texturae angularis composito. Paraphyses filiformes, hyalinae, septatae. Asci cylindranei, unitunicati, non-amyloidei, cum annulo apicale. Ascospores disciformes, brunneae, simplices, cum uno sulco longitudinale, vagine mucosa desunt. Conidia in pilis longis aggregata, lateralia, terminalia vel intercalaria, solitaria, brunnea, ovoidea vel ellipsoidea, verruculosa.

Species typica: *Ascotrichella hawksworthii* Valldosera & Guarro sp. nov.

Ascomata widely ovoid to subglobose, superficial, ostiolate, hairy, dark brown to black; peridium membranaceous, of textura angularis. *Paraphyses* filiform, hyaline, septate. *Asci* cylindrical, unitunicate, non-amyloid, with an apical ring. *Ascospores* discoid, brown, simple, with a longitudinal germ slit, without a gelatinous sheath, *Anamorph*: *Humicola*-like. Conidia ovoid to elliptic, developing on long ascomatal hairs, brown, verruculose, lateral, terminal or intercalary.

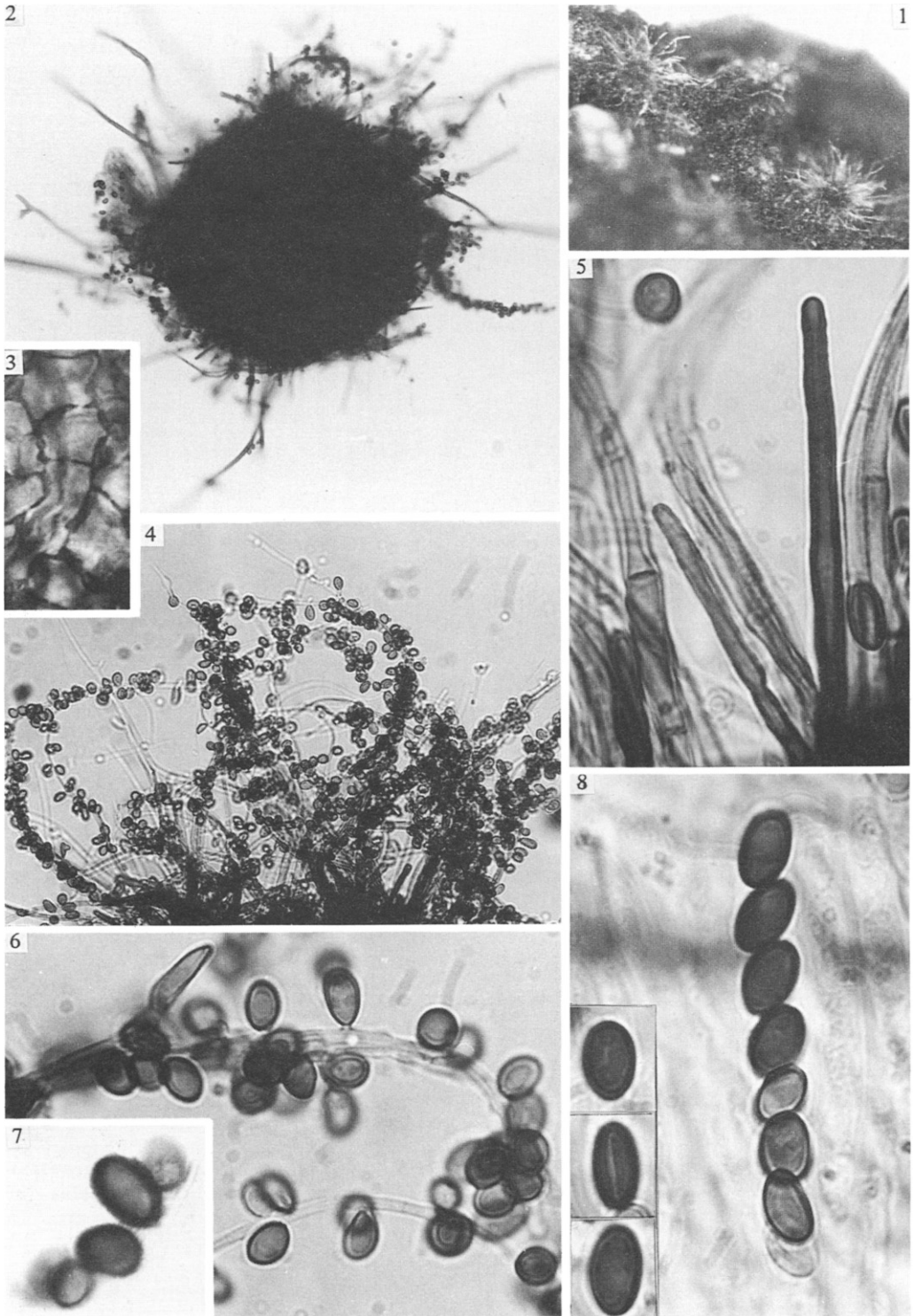
***Ascotrichella hawksworthii* Valldosera & Guarro sp. nov.** (Figs 1-8)

Etym.: named after D. L. Hawksworth

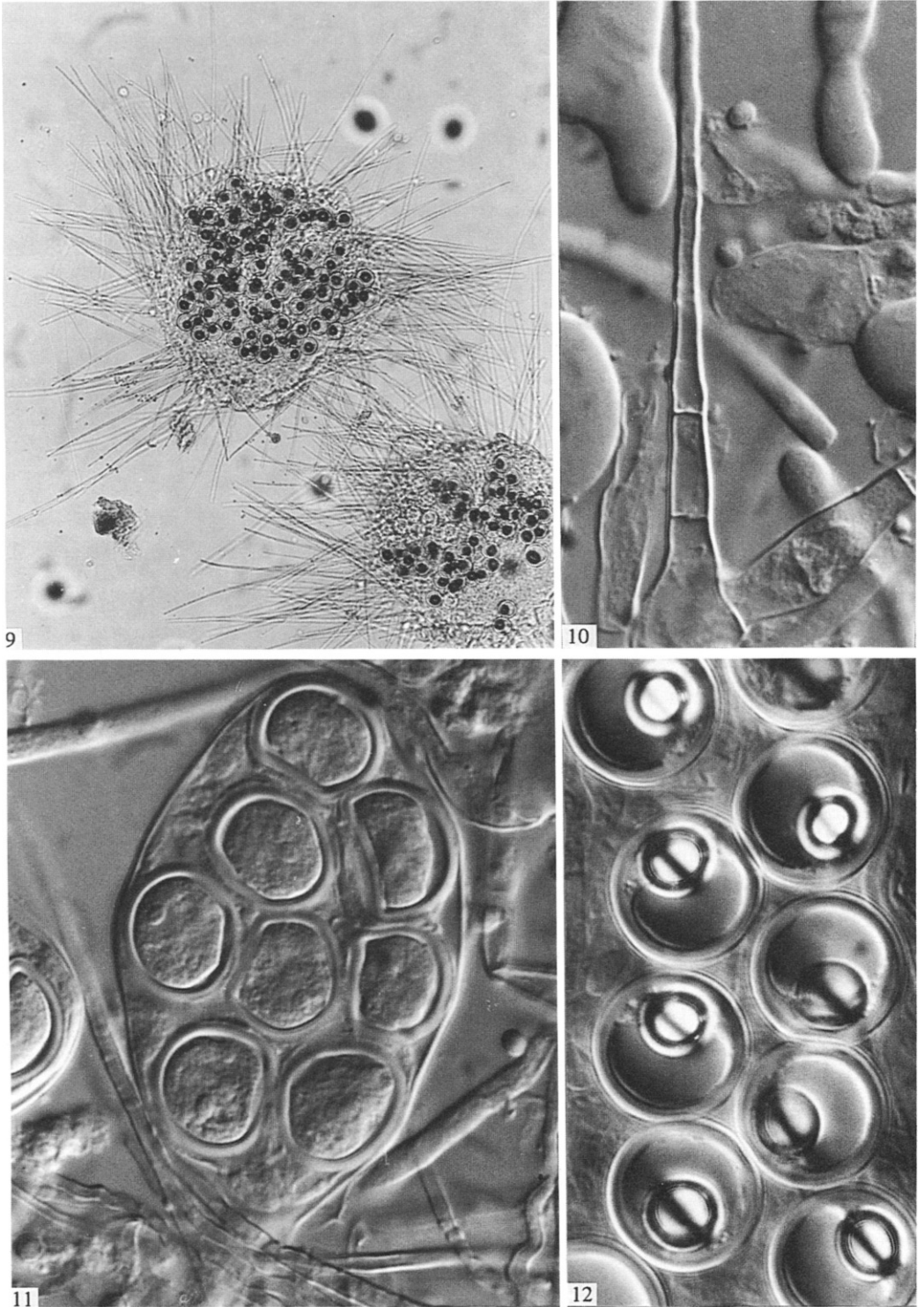
Ascomata late ovoidea vel subglobosa, atrobrunnea vel nigra, superficialia, ostiolata, pilosa, 200-250 μm diam. Peridium ex 2-3 stratis compositum, atrobrunneum, membranaceum, pseudoparenchymaticarum, texturae angularis composito, cellulis 3-7 μm longis. Paraphyses filiformes, hyalinae, septatae, simplices, 2.5-3 μm diam; pilis brevis rigidis, simplicibus, brunneis, cum crassis parietibus, 5-6.5 \times 2.5-3 μm , continuis vel pauciseptatis; pilis longis hyphoideis, flexuosis, hyalinis vel dilute flavo brunneis, septatis, 100-300 \times 2-2.5 μm . Asci 8-sporis, cylindranei, 70-75 \times 7-8 μm , superne rotundati, ad apicem cum annulo indistincto praediti, basi in stipitem brevem attenuati, evanescentes, cum iodo non reagentes. Ascospores uniseriatae, disciformes, atrobrunneae, 6.5-7.5 \times 4-4.5 \times 3.5-4 μm , cum un sulco longitudinale. Cellulae conidiogenae in pilis longis aggregatae, hyalinae vel dilute flavo-brunneae. Conidia lateralia, terminalia vel intercalaria, solitaria, ovoidea vel ellipsoidea, atrobrunnea, 6-7 \times 4-5 μm , verruculosa.

Holotypus ex fimo ignoto, Frutono, Chile, 21 June 1986, A. T. Martínez & A. F. González, FMR 2009; IMI 311114, isotypus.

Ascomata broadly ovoid to subglobose, dark brown, hairy, superficial, ostiolate (the ostiole inconspicuous), 200-250 μm diam; peridium dark brown, membranaceous, pseudoparenchymatous, 4-8 μm thick, composed of 2-3 layers of cells that form a textura angularis, cells 3-7 μm broad, walls ca 0.5-1 μm thick; short hairs stiff, blunt, dark brown, thick-walled, usually non-septate, 5-6.5 \times 2.5-3 μm ; long hyphal-like hairs, thin-walled, flexuous, septate, hyaline to light brown, 100-300 \times 2-2.5 μm , verrucose, with emerging conidia. *Paraphyses* filamentous, septate, hyaline, 2.5-3 μm diam. *Asci* 8-spored, cylindrical, 70-75 \times 7-8 μm , rounded above, with an indistinct ring at the apex not turning blue with iodine, evanescent, shortly stipitate. *Ascospores* uniseriate, discoid, dark brown, 6.5-7.5 \times 4-4.5 \times 3.5-4 μm , with a longitudinal germ slit. *Anamorph*: *Humicola*-like. Conidia solitary, simple 6-7 \times 4-5 μm , ovoid to



Figs 1-7. *Ascotrichella hawksworthii*. Fig. 1. Ascomata on dung, $\times 48$. Fig. 2. Ascoma, $\times 150$. Fig. 3. Peridium, $\times 1200$. Fig. 4. Upper part of the ascoma, $\times 300$. Fig. 5. Ascumatal hairs, $\times 1500$. Fig. 6. Conidia, $\times 1200$. Fig. 7. Mature verrucose conidia, $\times 1440$. Fig. 8. Ascus and ascospores, $\times 1200$.



Figs 9–12. *Trichobolus vanbrummelenii*. Fig. 9. Ascomata, $\times 200$. Fig. 10. Ascomatal hairs, $\times 1440$, Fig. 11. Ascus, $\times 1440$. Fig. 12. Ascospores, $\times 1700$.

ellipsoid, dark brown, developing on long ascomatal hairs, lateral, terminal or intercalary, smooth when young, becoming verruculose, 0-septate, rarely 1-septate. Conidiogenous cells monoblastic, integrated, intercalary, hyaline to light brown, determinate, cylindrical.

Ascotrichella is a typical non-stromatic member of the Xylariaceae. The lack of reaction to iodine in the asci has also been pointed out for other genera in the family, such as *Camillea* Fr., *Thammomyces* Ehrenb., *Pulveria* Malloch & Rogerson and *Wawelia* Namyslowski, and thus there are not enough grounds to exclude it from this family (Hawksworth & Lodha, 1983; Minter & Webster, 1983). *Ascotrichella* is very close to *Ascotricha*; in fact, both feature discoid ascospores with longitudinal germ slits, usually iodine-negative asci and hairy ostiolate ascomata. However, the genera differ in a number of characteristics. A *Dicyma* anamorph usually growing independently of the ascomata, the absence of short stiff hairs and presence of an apical apparatus in the asci are distinctive criteria for *Ascotricha*.

Ascotrichella is transitional between *Ascotricha* and *Coniochaeta* (Sacc.) Cooke. The latter is included by some authors in the Sordariaceae or the Coniochaetaceae, but should probably belong to the Xylariaceae. All three genera display ostiolate ascomata, cylindrical asci and discoid ascospores with longitudinal germ slits. All three can also grow on dung, although the last two are lignicolous and one often finds them fruiting on other substrates (Hawksworth, 1971; Mahoney & LaFavre, 1981). In *Ascotricha* the terminal hairs on the ascoma are generally long, hyphoid and with hyaline, sterile protrusions. In *Coniochaeta* on the other hand, they are frequently short, stiff and thick-walled. In *Ascotrichella* both types of hair occur. Conidiogenesis of the *Dicyma* anamorph of *Ascotricha* and those species of *Coniochaeta* with *Nodulisporium* and *Gemiculosporium* anamorphs are very similar. In some cases the hyaline protrusions of the terminal hairs in *Ascotricha* are reminiscent of conidia of *Ascotrichella*.

***Trichobolus vanbrummelenii* Valldosera & Guarro sp. nov.** (Figs 9-12)

Etym.: named after J. van Brummelen

Ascomata setosa, superficialia, solitaria vel gregaria, ovoidea, 150-450 μm diam crassa, primum hyalina, deinde flavida. Hymenium 100-150 μm crassum. Excipulum e stratis duobus compositum; excipulum ectale textura angulari cum cellulis hyalinis, 10-25 \times 6-12 μm magnis; excipulum medullare textura globulosa cum cellulis hyalinis, 12-18 μm diam. Setae numerosae, 65-180 μm longae, acutae, basi 4-9 μm latae, 2-5 basil-

aribus septis praeditae, parietibus 0.25-0.5 μm . Asci ovoidei, 20-60 in omni ascomata, octospori, 60-70 μm longi, 35-40 μm lati, parietibus 1-1.5 μm crassis, in iodo non caerulescentes. Paraphyses filamentosae, 3-5 μm diam, hyalinae. Ascosporae unicellulares, globosae, hyalinae, glabrae, 13-19 μm magnae, parietibus 1.5-2.5 μm crassis, bullulam unam continentes, sine vagina gelatinosa. Conidia incognita.

Holotypus ex fimo ignoto, Frutono, Chile, 21 June 1986, A. T. Martínez & A. F. González, FMR 2106; IMI 315780, isotypus.

Ascomata setose, superficial, sessile, solitary to gregarious, ovoid, 150-450 μm diam, closed throughout development, but ruptured apically by the maturing asci, hyaline then yellowish; excipulum two-layered, consisting of an ectal excipulum of textura angularis, with hyaline cells 10-25 \times 6-12 μm , and a medullary excipulum of textura globulosa with thin-walled, hyaline cells 12-18 μm diam. Setae numerous, 65-180 μm long, pointed, 4-9 μm wide at the base, 2- to 5-septate, walls 0.25-0.5 μm thick. Asci 20-60 per ascoma, ovate, 8-spored, 60-70 \times 35-40 μm , not blued with iodine; paraphyses filamentous, 3-5 μm diam. Ascospores one-celled, globose, hyaline, smooth, 13-19 μm diam, walls 1.5-2.5 μm thick, each with a single de Bary bubble. Conidia unknown.

Trichobolus (Sacc.) Kimbr. & Cain is characterized by septate setae and globose to subglobose ascospores. *T. vanbrummelenii* is the second species in the genus with 8-spored asci, the other being *T. octosporus*, which is clearly different because of its smaller ascospores (12-13 \times 10-12 μm) devoid of de Bary bubbles and its cylindrical asci. The remaining species, *T. zukalii* (Heimerl) Kimbr., *T. pilosus* (Schroet.) Kimbr. and *T. sphaerosporus* Kimbr. have multispored asci. Although spherical ascospores are rather frequent in the Pezizales, only one other genus, also coprophilous, has smooth-walled ascospores with de Bary bubbles when mounted in lactophenol. This is *Coprotiella* Jeng & Krug, which is monotypic. *C. gongylospora* appears to be rare, as we are aware of only two isolations (Jeng & Krug, 1976; Valldosera & Guarro, 1985). However, its ascomata are closed, and lack setae and paraphyses. *Coprotus* occasionally has subglobose ascospores but its ascomata always lack setae. Another genus somewhat related to *Trichobolus* is *Lasiobolus*, but this has aseptate setae and elongate ascospores.

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