

***Bombardioidea stercoris* (DC.) N. Lundq. PDD 126085 (= AEB 1400)**

Two other fungi with 4-spored asci (*Podospora anserina* & *P. tetraspora*) were also seen on the dung and are numerous on the herbarium hare dung pellets.

**Substrate:** hare (*Lepus europaeus*) dung

**Collected:** 26 February 2025; **Incubated in a moist chamber:** 26 April 2025

**Collection site:** Tararua Ranges near Mt. Holdsworth E1804046 N5472545, alpine vegetation: tussock (*Chionochloa flavicans*), *Celmisia* & *Dracophyllum*

**Collector:** Ian Flux & Merryl Park; **Identifiers:** Dan Mahoney & Ann Bell

**Voucher materials:** Six dried hare dung pellets accompanied by 4 Shear's mounting fluid (SMF) slide mounts. Although 6 pellets are represented, *B. stercoris* is more difficult to find since many of its ascomata were removed for slide mounts; in-situ fresh ascomata photos were taken using a Zeiss dissecting microscope; microscopic detail photos were taken from various SMF and water mounts using an Olympus BX51 compound scope with a DP28 camera; references consulted.

**References consulted:**

***Bombardioidea stercoris***

1. Lundqvist N. 1972. Nordic Sordariaceae s. lat. Symbolae Botanicae Upsalienses 20: 1-374. **See the next page for his illustrations & description of *B. stercoris*.**
2. Krug J.C. and Scott J.A. 1994. The genus *Bombardioidea*. Can. J. Bot. 72: 1302–1310. **See their key to species and the description of *B. stercoris* on the page after next.**
3. Bell A. 1983. Dung Fungi an illustrated guide to coprophilous fungi in New Zealand. Victoria University Press, Wellington. 88pp., 46 figs. **Her air-brushed details and her published illustration of *B. stercoris* are shown on the page after the Krug & Scott page.**

Portions of pages 277, 279 & 281 are reproduced below.

Key to the Nordic species

1. Asci 4-spored . . . . . 2
- Asci 8-spored; spores  $20-28(-31) \times 9.5-14(-15) \mu$ , with an apical germ pore and 3-5 small pores at the base imitating a germ pore . . . *B. bombardioides* p. 278
2. Spores  $24-34 \times 15-19 \mu$ , with an apical germ pore and 5-7 scattered small pores at the base (note that some spores may be reversed in the ascus) . . . . .
- . . . . . *B. serignanensis* p. 284
- Spores  $34-42 \times 18-21 \mu$ , with a germ pore at each end surrounded by several small pores . . . . . *B. stercoris* p. 281

*Bombardioidea stercoris* ([DC.] Schub.) Lundq. n. comb.

*Stromata*  $720-1345 \times 530-720 \mu$ , with a relatively thin outer crust of indistinct, epidermoid structure cracking into irregular, angular plates upon pressure, and with a thick inner cartilaginous layer. *Perithecia*  $385-485 \mu$  broad. *Asci* 4-spored,  $290-340 \times 25 \mu$ , with a cylindrical,  $120-145 \mu$  long sporidial part; apical ring c.  $4 \mu$  in diam., triangular in cross-section, c.  $1.5 \mu$  high, widening upwards; subapical chamber truncate above. *Spores* obliquely uniseriate, blackish brown, binucleate,  $31-42 \times 19-26 \mu$  equilateral, broadly fusiform, with an apical and basal germ pore and several small pores irregularly subapically and suprabasally dispersed. *Gelatinous sheath* swelling in water, especially at the ends, without visible microstructure, not blackening in Indian ink. Other characters as the generic description.

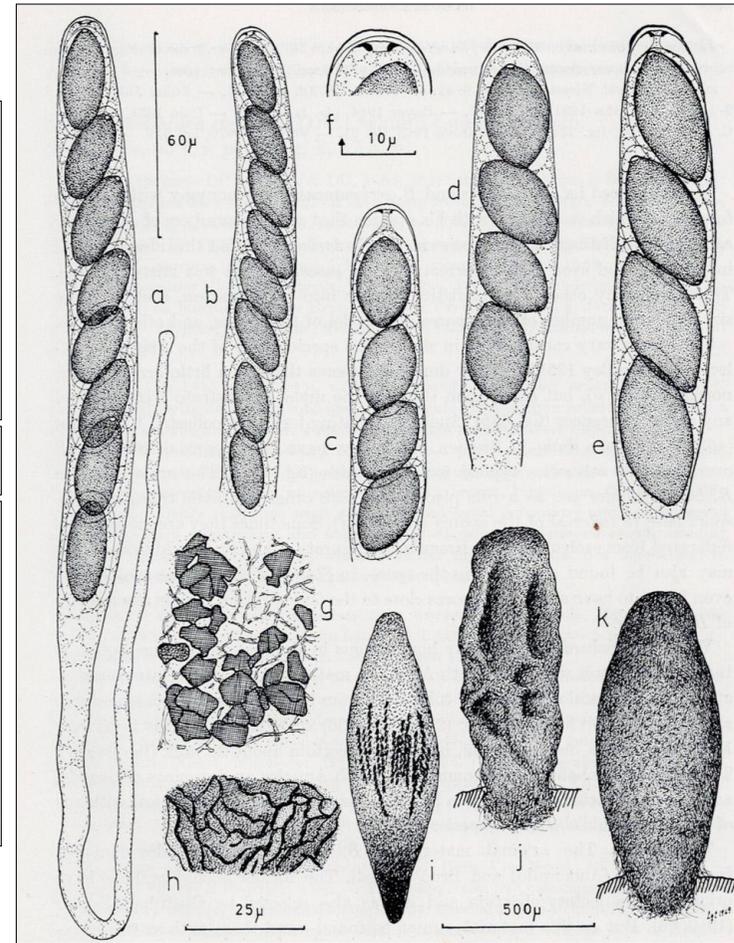


Fig. 65. a, j: *Bombardioidea* sp., on porcupine dung from Nez Perde Nat. Forest, Idaho Co. Idaho, USA, 16.xi.1946, W. B. & V. G. Cooke 18793 (S); Cooke, Mycob. N. Am. 244 as *Sordaria bombardioides*. b: *Bombardioidea bombardioides*, Crypt. Cech. Exs. 7 (UPS). g: Ditto, Rehm, Ascom. 233 (UPS). i: Ditto, N 4532-d (UPS). c: *Bombardioidea serignanensis*, Lqt 2742-a (UPS). h: Ditto, Lqt 4924-a (UPS). d, j, k: Ditto, K. Holm 22-31.vii.1966 (UPS). e: *Bombardioidea stercoris*, N 2517-h (UPS). Drawn from specimens in lactic blue. a-d: Mature asci and spores. f: Ascus tip, g, h: Stroma surface in horizontal view; in g the outer crust has cracked after pressure, uncovering the cartilaginous layer. i: Perithecium. j: Old, dried stroma. k: Fresh stroma.

Krug J.C. and Scott J.A. 1994. The genus *Bombardioidea*. Can. J. Bot. 72: 1302–1310.

Portions of pages 1303, 1308 & 1309 are reproduced below.

### Key to the species

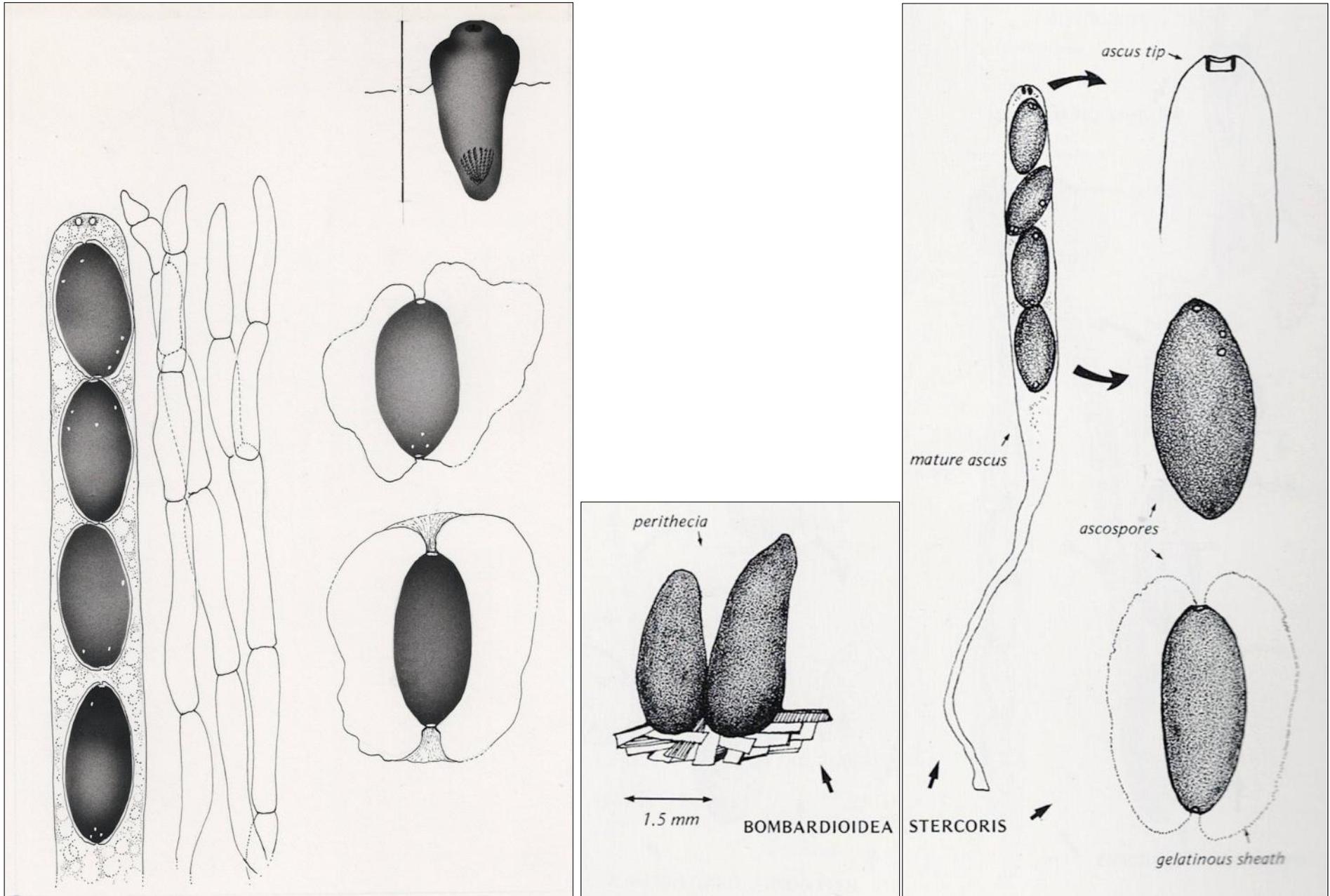
- 1. Asci 4-spored .....2
- 1. Asci 8-spored .....3
- 2. Ascospores ellipsoidal,  $35-43 \times 16-22 \mu\text{m}$ , with two distinct germ pores .....*B. stercoris*
- 2. Ascospores ovoid,  $25-31(-34) \times 16-19(-20) \mu\text{m}$ , with a large apical germ pore and a less conspicuous basal pore .....*B. serignanensis*
- 3. Ascospores uniseriate, ellipsoidal, symmetrical,  $19-29 \times 10-14 \mu\text{m}$ , on leporid dung .....*B. bombardioides*
- 3. Ascospores frequently irregularly biseriate, oblong-ellipsoidal, asymmetrically flattened,  $(25- )26-35(-38) \times 12-14(-15) \mu\text{m}$ , on cervid dung .....*B. anartia*

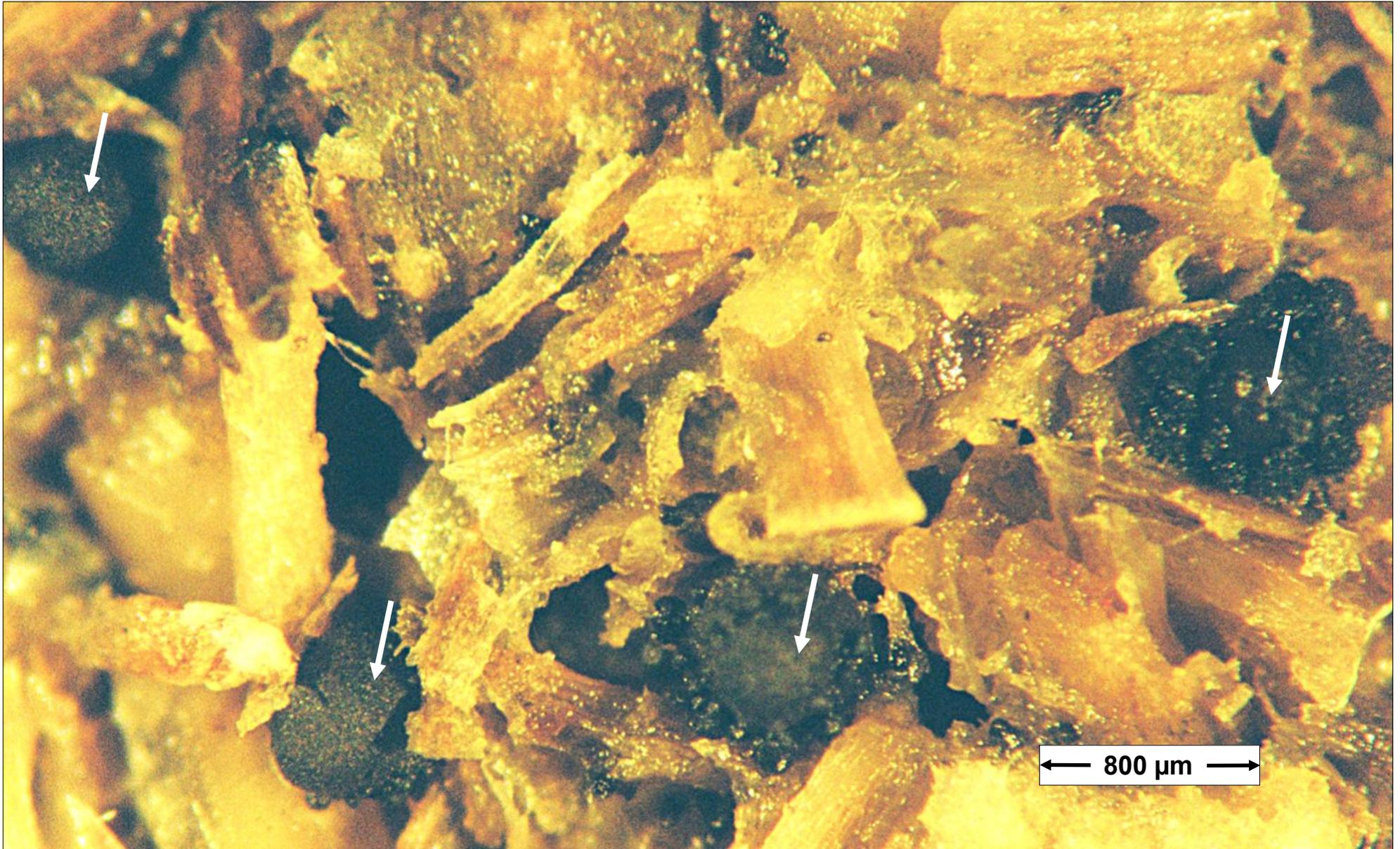
*Bombardioidea stercoris* (DC.: Fr.) Lundq., Symb. Bot. Ups. 20: 281. 1972

**Perithecia** aggregated in small clusters, confluent at the base or occasionally solitary, superficial or rarely erumpent, slightly roughened, bare, ovoid to oblong,  $700-1200 \times 500-625 \mu\text{m}$ , red-brown to black, with an indistinct, black ostiolar region with a small, prominent ostiole at the apex; **peridium** dark yellow-brown by reflected light, thickened, coriaceous, appearing in surface view of indistinct cellular structure,  $100-125 \mu\text{m}$  thick, **consisting of three layers, an outer layer** 1–2 cells thick, of oblong, somewhat thick-walled, brownish cells measuring  $6-10 \times 2-3 \mu\text{m}$ , **a middle layer** 80–100  $\mu\text{m}$  thick, of noncellular gelatinous matrix sparsely interspersed with branching, thin-walled, hyaline hyphae measuring  $1-1.5 \mu\text{m}$  in diameter, **and an inner layer** 5–6 cells thick, of oblong, thin-walled, brownish cells measuring  $8-12 \times 1.5-2 \mu\text{m}$ . **Asci** 4-spored, cylindrical,  $265-310 \times 21-28 \mu\text{m}$ , broadly rounded at the apices, tapering into a very long stipe measuring  $100-225 \mu\text{m}$ ; **apical ring** small, indistinct. **Paraphyses** abundant, filiform, septate, hyaline, longer than and mixed with the asci. **Ascospores** one-celled, obliquely uniseriate, surrounded by a hyaline gelatinous sheath reaching a width of about  $5 \mu\text{m}$ , ellipsoidal or rarely slightly flattened on one side, narrowed towards the ends,  $35-43 \times 16-22 \mu\text{m}$ , ranging from hyaline when young to yellowish brown and opaque at maturity, **containing at each opposing end of the spore a germ pore** measuring  $2-5 \mu\text{m}$  in diameter.

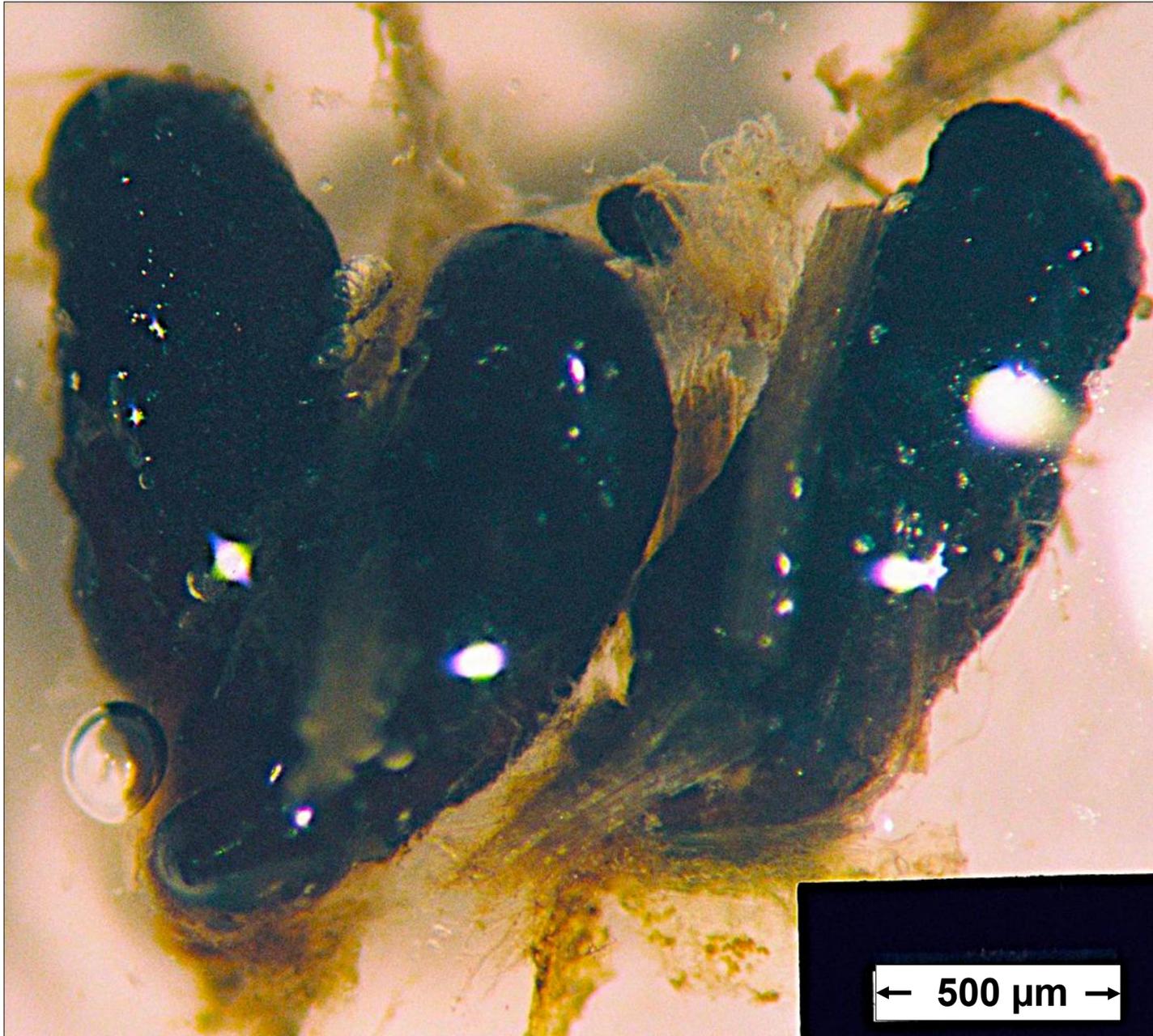
HABITAT: On hare and rabbit dung.

Left below – Ann's 22-11-1987 air brushing of *Bombardioidea stercoris*. Right below – Illustrations on p. 74, Fig. 39 from Ann Bell. 1983. Dung Fungi an illustrated guide to coprophilous fungi in New Zealand. Victoria University Press, Wellington. 88pp., 46 figs.





**AEB 1400. In-situ overhead ascomata photo taken using a Zeiss dissecting microscope. The ascomata shown are mostly sunken in the outer covering of a hare dung pellet. Although small, an ostiole (arrowed) can be seen. The photo on the next page reveals the size of fresh ascomata that I dug out of the hare dung surface.**

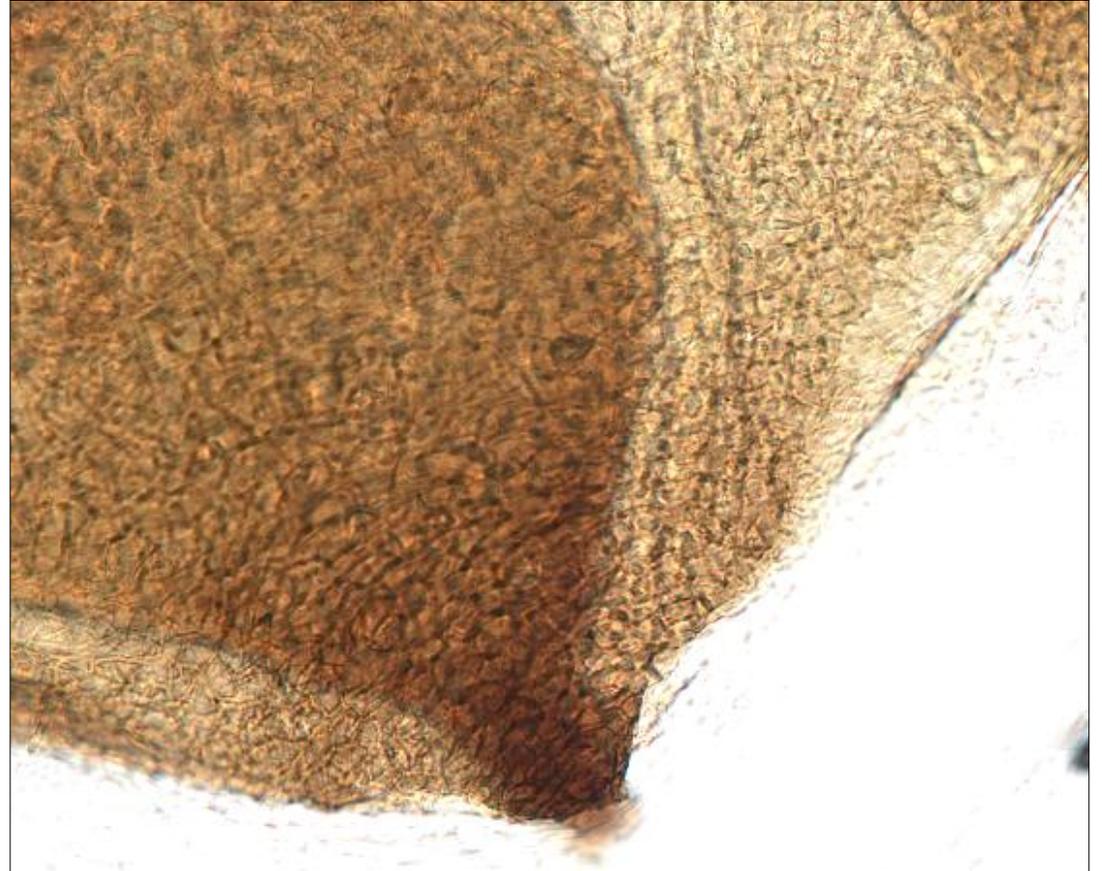
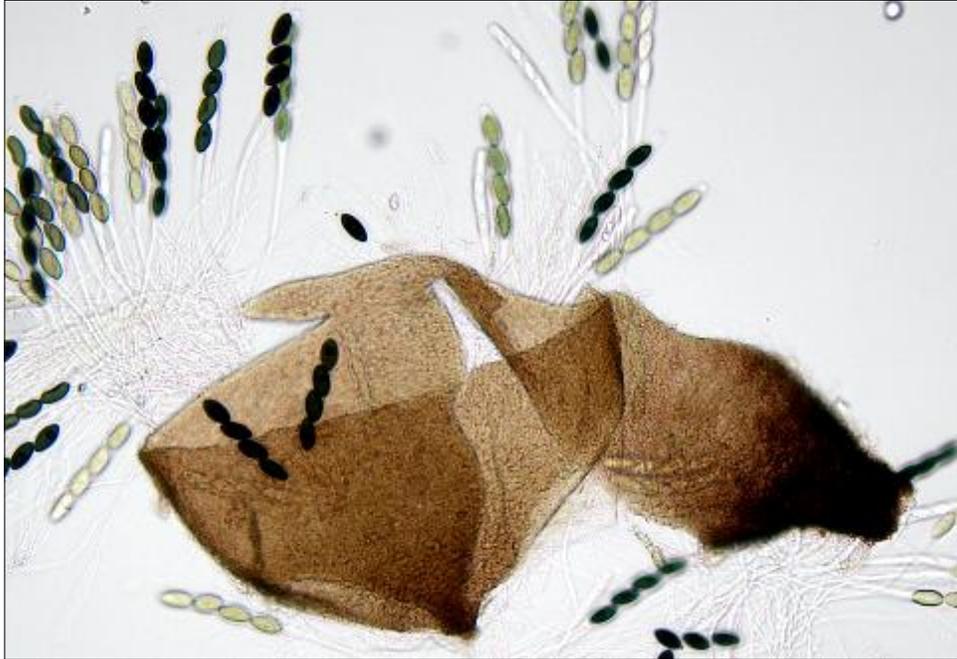


**AEB 1400. A cluster of 3 fresh mature ascomata I dug out from their sunken position on the surface of a hare dung pellet and photographed in a water mount (no coverslip) using a Zeiss dissecting microscope.**



AEB 1400. A water mount (with coverslip) showing the same ascoma using the X10 objective of an Olympus BX51 compound scope. Left photo taken first; right photo taken after slightly squashing the ascoma. The whole ascoma measured  $1200 \times 550 \mu\text{m}$ .

Worth noting are Krug & Scott's description (p. 3 of this pdf) of the 3 wall layers of this complicated ascoma (their term perithecium):  
“peridium consisting of three layers, an outer layer 1–2 cells thick, of oblong, somewhat thick-walled, brownish cells (black arrows), a middle layer 80–100  $\mu\text{m}$  thick, of noncellular gelatinous matrix sparsely interspersed with branching, thin-walled, hyaline hyphae (white double-ended arrows – detail not apparent here) and an inner layer 5–6 cells thick, of oblong, thin-walled, brownish cells (white arrows). The inner layer surrounds the centrum and its asci – with the asci seen here being squashed out at the base of the perithecium.



**AEB 1400. A SMF mount showing the same field of view using the X10 & X40 objectives. Left: asci & broken base of centrum with peridium inner wall. Right: closeup of the peridium inner wall.**



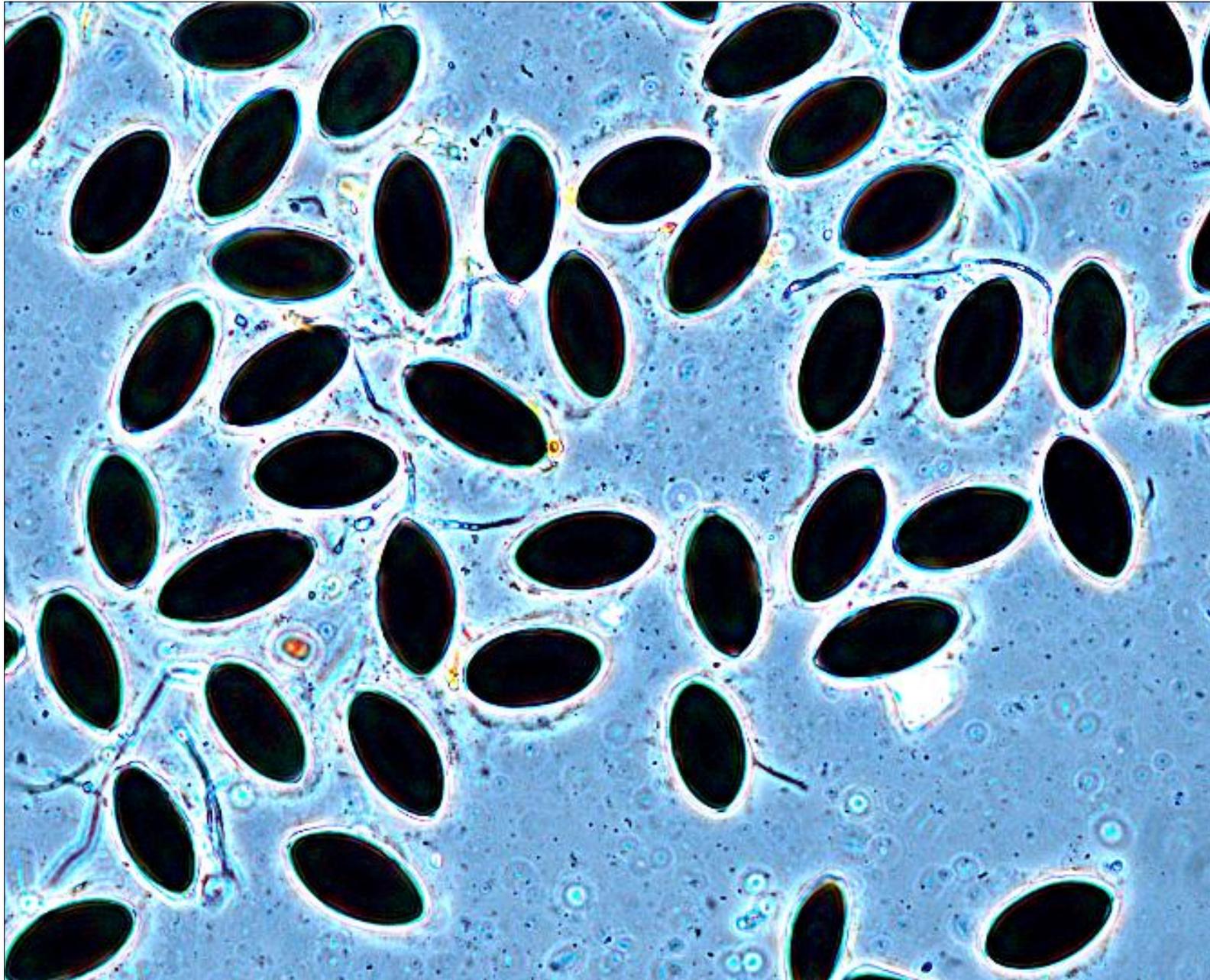
**AEB 1400. Main photo: variously mature, long-stiped asci in a water mount using the X20 objective. Lower right photo: ascospores in water mount X40 obj. Note the polar germ pores and the hyaline gelatinous sheath.**



**AEB 1400. Asci and ascospores in a water mount using a X40 objective. Mature ascospores seen here were  $40\text{--}42 \times 20 \mu\text{m}$ . Note the small ascus apical rings (arrowed).**



**AEB 1400. Another water mount using the X40 objective. Note the long-stalked asci with ascospores in various stages of development.**



**AEB 1400. Ascospores in a water mount using the X40 objective and phase microscopy. Note their shapes, bipolar germ pores and hyaline gelatinous sheaths.**