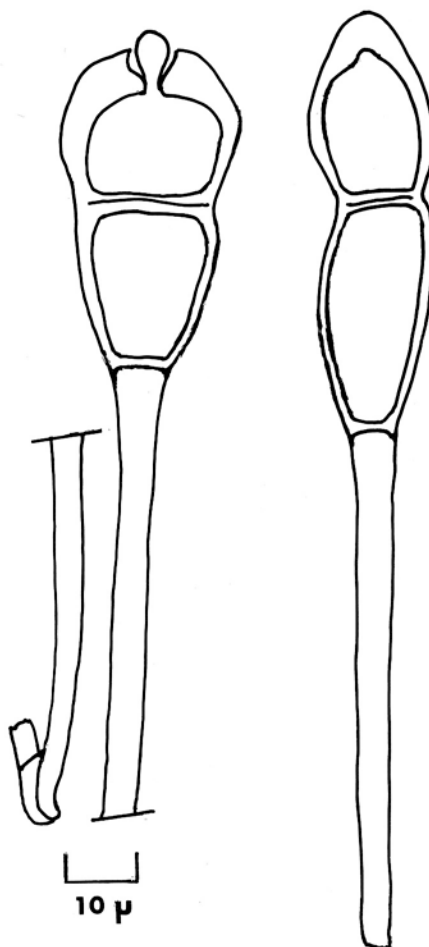


Teliospores in optical section.



Puccinia holboellii (Hornem.) Rostr., Med. Grønland 3: 534. 1888.

≡ *Aecidium holboellii* Hornem., Fl. Dan. 37: 11. 1840.

PHYCNIA generally lacking, rarely seen on some leaves only, and then inconspicuous and depauperate. AECIA and UREDINIA lacking. TELIA chiefly hypophyllous, but sparingly epiphyllous, occasionally freely caulicolous and on flower parts (notably on *Arabis arenicola*), systemic, generally crowded, ca. 0.2-0.6 mm diam., strongly pulvinate (often hemispheric), deep yellow-brown to chestnut. TELIOSPORES usually germinating freely at maturity, (30-)33-55(-64) × (14-)15.5-26(-28) μ, slightly to moderately constricted, broadly conic to rounded above, tapering to base; walls 0.7-1.2(-1.5) μ min. in lower cell, (3-)4-9(-11) μ at apex; germ pores apical and more or less septal; pedicels hyaline (rarely yellowish), firm, ca. 50-120(-130) μ long.

HOSTS: *Arabis*, *Draba* and *Erysimum*.

DISTRIBUTION: Yukon, Mackenzie, Franklin, British Columbia, Alberta, Saskatchewan, Ontario, Quebec.

COLLECTIONS: *Arabis arenicola* (Richards.) Gelert: Ont.: S. of C. Henrietta Maria, DAOM 40165 (Dutilly & Lepage 31427). Que.: Great Whale River, 23796, 23797 (Savile 244, 502); Fort Chimo, 66851 (Savile et al. 3981); Koksoak R., 19165 (Dutilly & Lepage 14669). *A. divaricarpa* A. Nels.: B.C.: Bluff L., 146474 (Calder et al. 17276); Galloway, 41922 (Calder & Savile 9101). Ont.: Sleeping Giant, Thunder Bay, 77836 (Taylor). *A. drummondii* Gray: B.C.: Sylvan Mine near Smithers, 41923 (Calder et al. 12942). Alta.: Sunshine Area near Banff, 92748 (Moss 12642). *Arabis holboellii* Hornem. vars. (and

indet. hosts at least mostly in this complex): Yukon, 4; Mack., 3; B.C., 21; Alta., 5. *A. lemmonii* Wats.: B.C.: Mt. McLean, Lillooet, 41940 (Calder et al. 15561); Paradise Mine near Windermere, 41939 (Calder & Savile 11251). *A. lyallii* S. Wats.: B.C.: Garibaldi, 5958 (Eastham); Cathedral Lakes, 54323 (Calder et al. 19633); Paradise Mine near Windermere, 41925 (Calder & Savile 11311); Starvation Peak, 146473 (Taylor et al. 3235). Alta.: Sunshine Area near Banff, 124971 (Savile et al. 4939). *A. lyrata* L.: Yukon: Otter L., 146483 (Kukkonen & Calder 571). B.C.: Fairy L. near Alaska Hwy., 146495 (Kukkonen & Calder 486); Pine Pass, 146496 (Kukkonen & Calder 458); Red Rose Mine near Hazelton, 41936 (Calder et al. 13354); near Topley, 41938 (Calder et al. 12879). Sask.: Prince Albert, 71579 (Riley & Zalasky). Que.: Richmond Gulf, 20777 (Dutilly & Lepage 13153a). *Arabis nuttallii* Robinson: B.C.: mtn. NE of Pollock, 146497 (Taylor & Ferguson 2930). Alta.: Hunchback Falls, Crowsnest R., 146498 (Calder & Spicer 32825); Waterton Lakes Nat. Park, 97464 (Moss 3109). *Draba cana* Rydb. (*D. lanceolata* auct. non Royle): Alta.: Waterton Lakes Nat. Park, 97462 (Moss 10195). *D. incana* L.: Que.: Old Factory, 15231 (Dutilly & Lepage 12244). *D. sp.*: Alta.: Pincher Creek, 97463 (Moss SSS 1226). *Erysimum pallasii* (Pursh) Fern.: Frank.: Axel Heiberg and Ellesmere Is., 16 collns, mostly cited in Savile and Parmelee (Can. J. Bot. 42: 706. 1964).

NOTES: The above description is based on the 88 cited Canadian specimens, 7 from Alaska and 6 from western United States on *Arabis* spp., and one on *A. holboellii* (the type host) from Itivdlek Fiord, SW Greenland, 200 km. from the type locality. In this material morphological variability seems to be random rather than geographic or by host. *P. thlaspeos* Schub., with which *P. holboellii* has been confused, has sori smaller (0.1-0.3 mm diam.), yellow-brown rather than deep yellow-brown to chestnut, flat to slightly pulvinate rather than strongly pulvinate; and spores markedly narrower [$29-53(-58) \times 11-18.5((-21))\mu$], not or slightly constricted, with walls subhyaline to yellow-brown, and pedicels ca. $30-65(-75)\mu$ long. Its description is based on specimens on *Arabis hirsuta* (4, Finland, Norway, Switzerland), *Thlaspi alpestre* (2, Switzerland, Italy), *Th. fendleri* var. *glaucum* (1, Wyo.), *Th. montanum* (1, Switzerland). Three Finnish specimens on *Erysimum hieraciifolium*, issued as *P. thlaspeos*, are somewhat variable but fit much better in *P. holboellii*; this rust has perhaps diverged slightly after becoming isolated from the arctic rust on *E. pallasii*. *P. aberrans* Peck (on *Smelowskia*, Can. J. Bot 52: 1501. 1974) differs from *P. holboellii* in having slightly longer and wider spores, with thicker walls that may be rugulose above, and irregularly deciduous pedicels; and germination at maturity is reduced. *P. codyi* (Fungi Canadenses No. 46, also on *Smelowskia*) has numerous well-formed pycnia, black telia, large spores with chestnut walls, long and persistent pedicels, and no germination at maturity. It may be noted that a specimen on *Schoenocrambe linifolia*, from Mancos, Colo. (Bethel), distributed as *P. holboellii* is evidently distinct, not surprisingly so in view of the distant host relationship.

The high degree of apomixis in many new-world *Arabis* makes some specific assignments difficult and arbitrary. I have followed Rollins (Rhodora 43: 289-325, 348-411, 425-481. 1941) in the broad concept of especially *A. holboellii*, but have omitted varietal names in the citations for brevity and because of doubtful varietal disposition of many rusted plants.

D.B.O. Savile