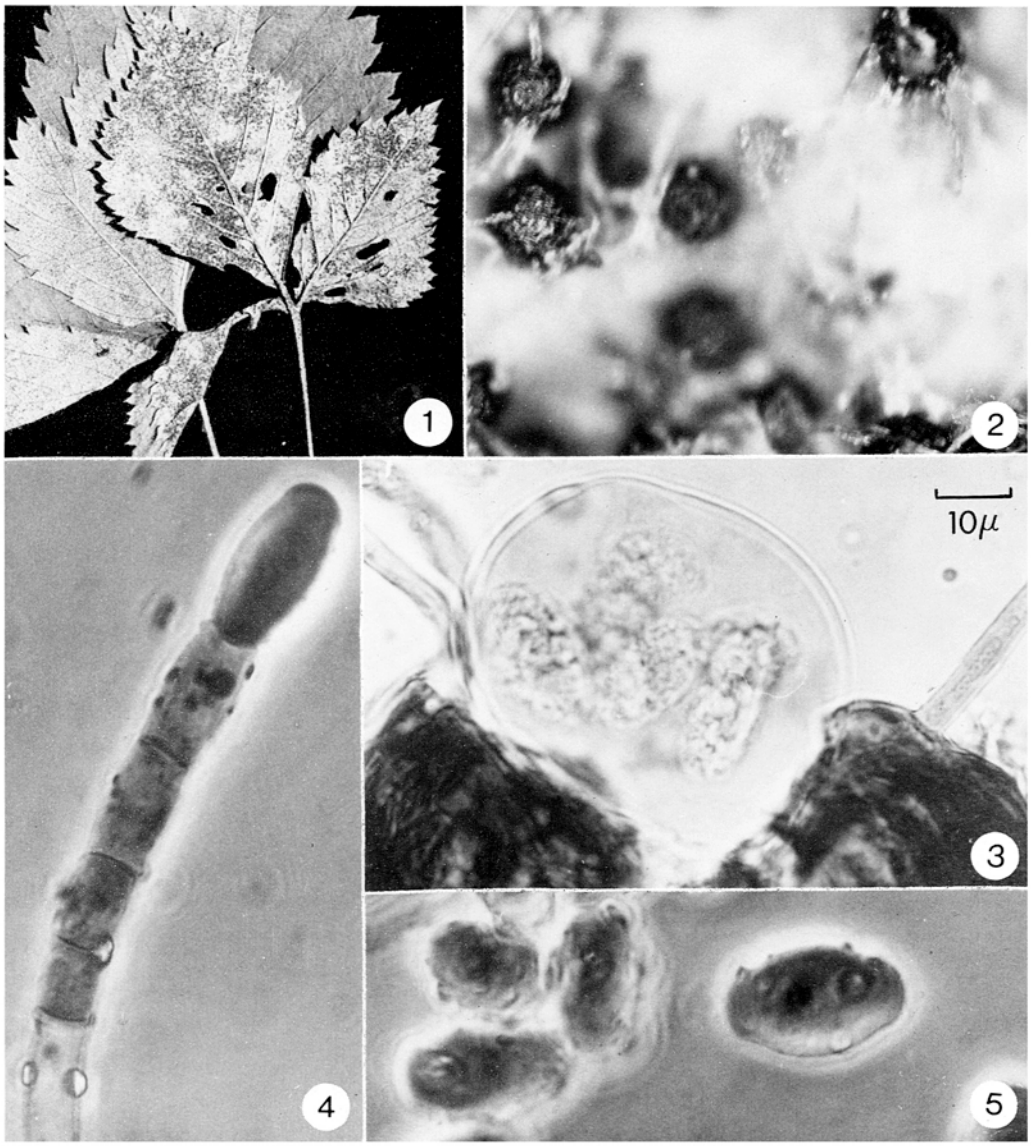
SPHAEROTHECA MACULARIS



1, Habit on *Rubus pubescens* (× 1.3); 2, cleistothecia on *Physocarpus opulifolius* with irregular appendages (× 100); 3, crushed cleistothecium and single ascus with pore and ascospores; 4, conidiophore with a mature apical conidium (phase contrast); 5, conidia (phase contrast). 1, from DAOM 147514; 3, from 147515; 4, 5, from 147516. Magnification in 4 and 5 as in 3.

Sphaerotheca macularis (Wallr. ex Fr.) P. Magn., Bot. Centralbl. 77: 10. 1899.
[≡*Alphitomorpha macularis* Wallr., Verh. Ges. Nat. Freunde Berlin I: 35. 1819.]
≡*Erysiphe macularis* (Wallr.) ex Fr., Syst. Myc. 3: 237. 1829.

CLEISTOTHECIA on fruits, leaves (one or both sides), stems, as black globoid bodies 70-120μ diam. APPENDAGES, about 10-20, simple, irregular, septate, brownish near base, in length ½-2 times diameter of ascocarp. ASCUS single, 55-105 × 45-75μ, broadly ellipsoidal. ASCOSPORES (6-)8, hyaline, ellipsoidal, 15-30 × 10-17.5μ. CONIDIAL STATE precedes and accompanies the cleistothecia as a widely effused whitish bloom. CONIDIA narrowly to broadly ellipsoidal, hyaline, smooth, non-septate, basipetally catenate, 24-27 × 12.8-16.0μ. CONIDIOPHORES hyaline, short, simple branches on the mycelium. MYCELIUM hyaline, septate, superficial. HAUSTORIA intraepidermal, globoid, 12.5-17.5μ diam.

HOSTS: Anacardiaceae: *Rhus*. Cannabinaceae: *Humulus*. Geraniaceae: *Geranium* spp. Polemoniaceae: *Collomia*. Rosaceae: *Agrimonia* spp., *Filipendula* spp., *Geum* spp., *Physocarpus*, *Potentilla* spp., *Rosa*, *Rubus* spp., *Sanguisorba* spp., *Spiraea* sp.

DISTRIBUTION: Nfld., N.S., Que., Ont., Man., Sask., Alta., B.C.

COLLECTIONS (selected): *Rhus typhina*: Ont., London, 17 Aug. 1912, DAOM 136219 (as *S. humuli* in Fungi Col. 2089). *Humulus lupulinus*: Ont., Toronto, 1 Oct. 1915, 86376 (TRTC 220). *Geranium viscosissimum*: B.C., Bridesville, 28 July 1938, 4212. *Collomia linearis*: Sask., Driver, 15 Aug. 1958, 60187; B.C., Pavilion, 6 Aug. 1963, 113797 (DAVFP 15585). *Agrimonia gryposepala*: Que., Murray Bay, 18 Sept. 1929, 1507. *A. pubescens*: Ont., L. Timagami, 12 Sept. 1929, 86381 (TRTC 1469). *A. striata*: Alta., Edmonton, 9 Sept. 1931, 2221. *Filipendula rubra*: Ont., Westboro, 5 July 1941, 7280. *Geum canadense*: Ont., Norwich, 1 Sept. 1934, 86378 (TRTC 7225). *G. macrophyllum*: B.C., Sidney, 1915, DAOM 142773 (Macoun). *G. aleppicum* var. *strictum*: Que., Buckingham, 26 Sept. 1891, 142175. *Physocarpus opulifolius*: Ont., Port Rowan, 19 May 1963 [overwintered], 115274 (TRTC 41289). *Potentilla fruticosa*: Ont., Port Frank, 26 Aug. 1911, 137212 (Dearness). *P. palustris*: N.S., Cape Breton, L. Ainslie, 21 Aug. 1937, 4942. *Rubus chamaemorus*: Que., Mal Baie, 14 Aug. 1959, 63854. *R. idaeus*: Sask., Prince Albert, 18 Aug. 1942, 8058. *R. macropetalus*: B.C., Victoria, 26 July 1968, 124921. *R. odoratus*: Que., Isle Perrot, 9 Aug. 1937, 14558. *R. pubescens*: Ont., Thunder Bay Dist., Black Sturgeon Lake, 8 Sept. 1973, 147514. *Sanguisorba canadensis*: Nfld., Leonard, near Deer Lake, 4 Aug. 1949, 92811; Que., St. Fabien, 14 Sept. 1961, 84543. *S. sitchensis*: B.C., Prince Rupert, 8 Sept. 1956, DAOM 62274 (DAVFP 11012).

NOTES: North American listings treat this fungus under the binomials *Sphaerotheca humuli* (DC.) Burr. (Index of Plant Diseases in the United States, Handbk. 165, U.S.D.A., 1960) and *S. macularis* (Wallr. ex Fr.) W.B. Cooke (Conners, Annotated index of plant diseases in Canada, Res. Br. Publ. 1251, Can. Dept. Agric., Ottawa. 1967). The fungus is treated here in a similar broad concept and the nomenclature follows Jørstad (Parasitic micromycetes from the Canary Islands. Oslo University Press, 1962). A restricted concept has been adopted by Junell (Erysiphaceae of Sweden, Symb. Bot. Upsal. 19: 1. 1967) who limits the use of the name "*Sphaerotheca macularis* ([Wallr.] Fr.) Lind" to the fungus on *Humulus* (hops) and recognizes a number of other segregates on the basis of host. For instance, the mildew on *Sanguisorba* is "*Sphaerotheca ferruginea* ([Schlecht.] Fr.) Junell". I cannot follow Junell's treatment because the Canadian material shows no morphological differences to support segregation based only on host.

Mildew on *Agrimonia*, *Geum*, *Rubus* and *Sanguisorba* is wide-spread in Canada, but on hosts such as *Collomia* (Sask. and B.C.), *Physocarpus* (Ont.), *Potentilla* and *Humulus* (Ont.), its distribution is limited because of the limited distribution of the host; for example, in North America, *Physocarpus opulifolius* is an eastern species.

Mildew on *Physocarpus* is of particular interest because, although very conspicuous on fruits and leaves, it was not until 1968 that mildew was first recorded on this host in Canada (Pilley, P.G. & R.A. Trieselman. A synoptic catalogue of Cryptogams deposited in the Ontario region Herbarium. Inf. Rep. 0-X-80, For. Res. Lab., Sault Ste. Marie, Ontario. 1968).

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