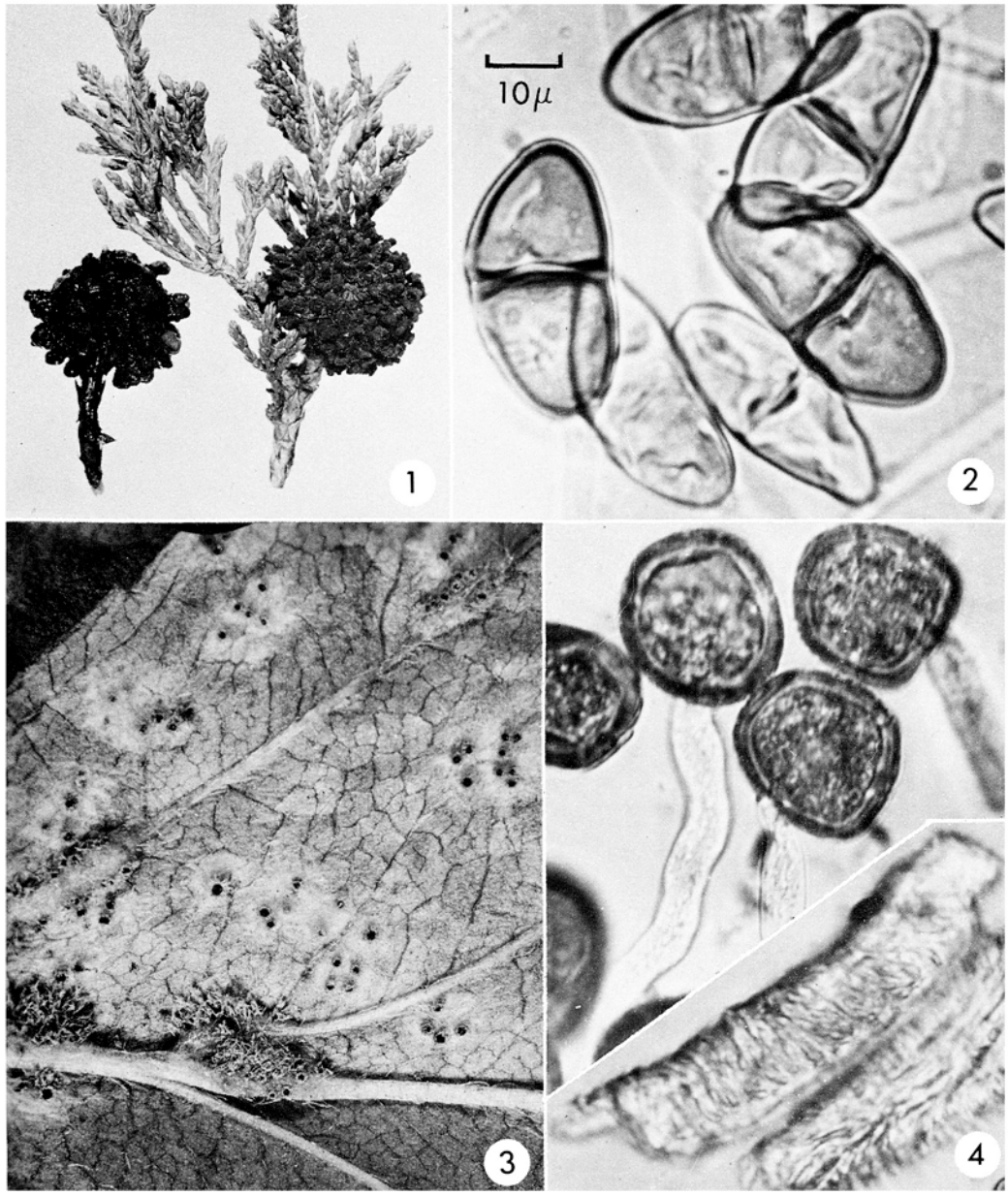
GYMNOSPORANGIUM CONNERSII



1, Telia (L) wet, (R) dry, about natural size; 2, teliospores; 1 and 2 from DAOM 75212 (Type). 3, Aecia X5; 4, aeciospores germinating, and peridial cells; 3 and 4 from DAOM 75218.

Gymnosporangium connersii Parmelee, Can. J. Bot. 43: 245. 1965.

PYCNIA epiphyllous, yellow becoming black, globoid and subepidermal on chlorotic spots. AECIA hypophyllous, petiolicolous, fructicolous, causing hypertrophy of vascular tissue; peridium pale brown finely lacerate apex to base and ± losing shape but not revolute. AECIOSPORES globoid, 21-33 × 16-32 μ; wall brown, 1.5-3.6 μ thick, densely verrucose with pores 6-10, scattered; peridial cells regularly seen in side view, linear-rectangular, curved slightly in lactophenol, 42-125 × 9.0-25 μ, coarsely rugose, ridges extending across cell, inner wall rough, 2.4-4.8 μ thick, outer wall smooth and 1.0-2.4 μ thick. TELIA crowded on globoid, perennial galls 10.0(-15.0) mm diam., cylindric-truncate 2.0-3.0 mm long. TELIOSPORES blunt ellipsoid, slightly or not constricted at septum, 32-58 × 14-26 μ, pores 1-2 per cell, septal, wall smooth pale yellow to dark yellow-brown 0.7-2.4 μ thick; pedicel hyaline, cylindric, many times length of spore.

HOSTS: 0 I *Crataegus* and III *Juniperus*.

DISTRIBUTION: Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan and Alberta.

COLLECTIONS: 0 I on *Crataegus brunetiana* Sarg.: Que.: La Pocatière, 13 Aug.1957, DAOM 75218 (Parmelee 542a); St.Roch des Aulnaies, 13 Aug.1957, DAOM 75220 (Parmelee 537 & Kihl). *C. chrysocarpa* Ashe,: Sask.: Cypress Hills, 2 Aug.1947, DAOM 133003 (Breitung); Alta, Cypress Hills, alt. 4300 ft., 13 Aug.1947, DAOM 133004 (Breitung). *C. douglasii* Lind.: Sask., near Swift Current, 6 Aug.1952, DAOM 133005 (Boivin 10,067 & Alex). *Crataegus* sp.: N.S., Ballantyne's Cove, 25 July 1968, DAOM 137845 (Parmelee); Que., La Pocatière, 7 Aug. 1933, DAOM 3527 (Campagna); Ont., Bruce Pen., Lions Head, 24 July 1932, DAOM 76509 (Cain ex TRTC 3976); Man., Holland, 9 July 1929, DAOM 96660 (Conners & Gordon); Sask.: Estevan, 9 Aug. 1929, DAOM 1458 (Conners & Sallans); Haymeadow, 5 July 1926, DAOM 23264 (Machacek); Saskatoon, 5 July 1925, DAOM 133006; Alta, Edmonton, Univ. of Alberta Campus, June 1961, DAOM 89272 (Piening). Also by artificial inoculation at Ottawa the following: *Crataegus canadensis* Sarg., *C. intricata* Lange, *C. pedicillata* Sarg., *C. submollis* Sarg.

III on *Juniperus horizontalis* Moench.: N.S., Ballantyne's Cove, 23 May 1964, DAOM 105638 (Parmelee 3237); Que.: La Pocatière, 15 May 1957, DAOM 75212 (Parmelee 519 & Conners (Type)); St.Denis, 15 May 1957, DAOM 75213 (Parmelee 522 & Conners); Notre Dame du Portage, 28 May 1948, DAOM 132649 (Genereux & Payette); St.Roch des Aulnaies, 15 May 1957, DAOM 75214 (Parmelee 523 & Conners); Man., Carberry, 24 May 1969, DAOM 130459 (Marshall). *Juniperus scopulorum* Sarg., Man.: Fort Garry, 6 May 1952, DAOM 34118; Brandon, 15 May 1969, DAOM 133002 (Marshall).

NOTES: Aecial collections from North Dakota (Barth., N.Am. Ured. 3110 on *Crataegus succulenta* Schrad.) and South Dakota (Brenkle, F. Dakotensis 331 on *Crataegus* sp.) also belong in this species. Both specimens were originally issued as *G. bethelii*, but peridial cell characters and early date of maturity match *G. connersii*.

The telia are not unlike those of *G. globosum* Farl. and *G. nelsonii* Arth. (= *G. corniculans* Kern) and the aecia are somewhat like those of *G. globosoum* and *G. bethelii* Kern but there are differences and these are pointed out in keys by Parmelee (Can. J. Bot. 43, 1965 and Can. J. Bot. 49, 1971). The characters singular to *G. connersii* are the short truncate telia and the early maturing aecia with slightly curved and coarsely rugose peridial cells.

The connection between 0 I and III states, indicated by the rusting of contiguous juniper and hawthorn in Nova Scotia and Quebec, was proved by inoculations outdoors at Ottawa, Ont. and in the greenhouse at Kananaskis, Alta. (ops. cit.). Both natural infection and artificial inoculation produce mature aecia in 50-60 days. In Canada, mature aecia are found about mid-July.

The epithet honours I.L. Conners who successfully inoculated *Crataegus* with teliospores in 1935 and who first suspected differences from the then known *Gymnosporangia*.

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