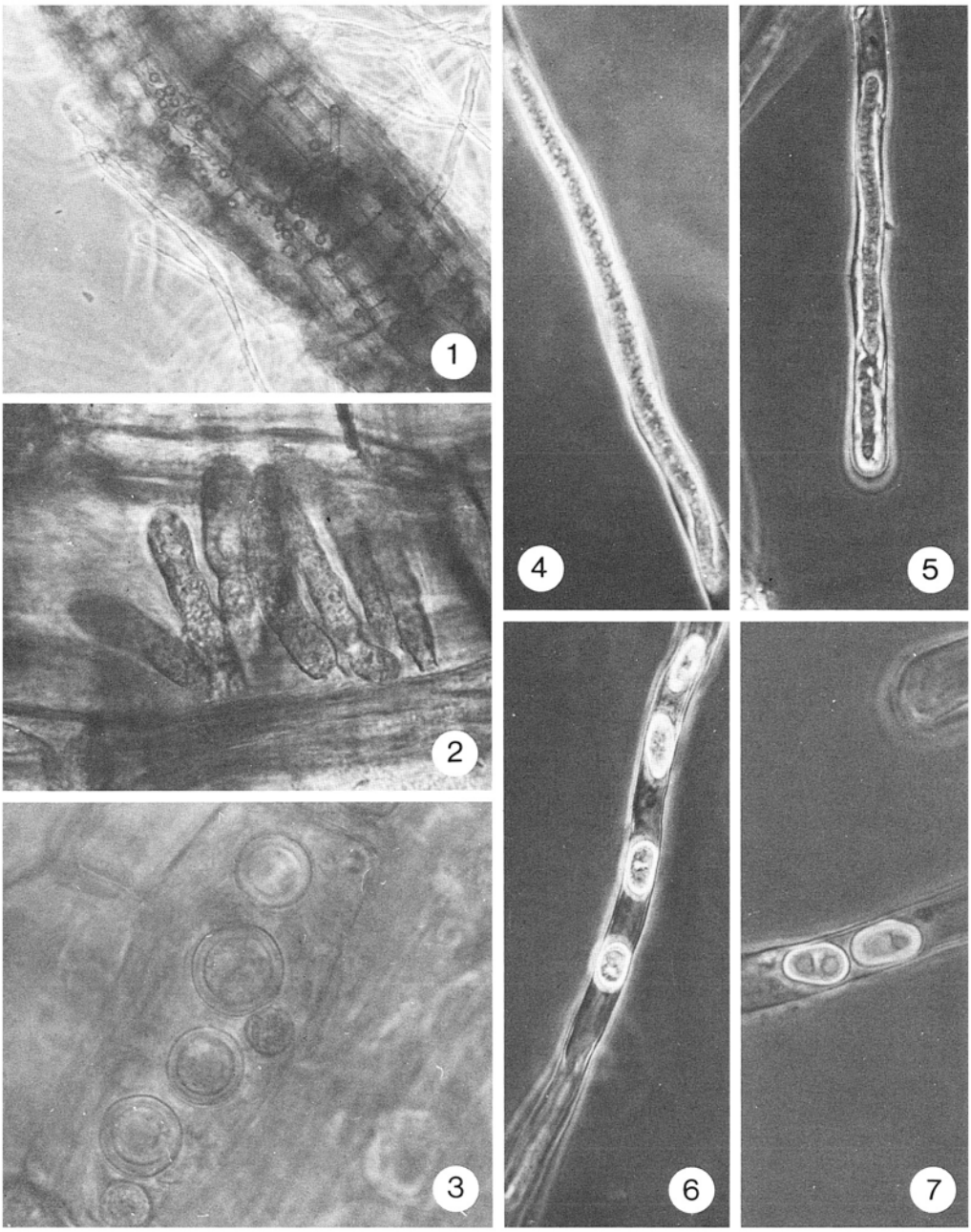
LAGENA RADICICOLA



1, Resting spores in root cells, × 190; 2, mature sporangia, × 770; 3, resting spores, × 770; 4,5, thalli in root hairs, × 770; 6,7, resting spores in root hairs, × 770. All from an Ottawa isolate in wheat roots.

Lagena radicicola Vanterpool & Ledingham, Can. J. Res. 2: 192. 1930.
= *Lagenocystis radicicola* Copeland, p. 82. The Classification of Lower Organisms. Pacific Books, Palo Alta, California. 1956.

IMMATURE THALLUS: intracellular, tubular, unbranched except occasionally at point of penetration when bidirectional, highly variable in size (dependant on the number of infections per host cell), 7-16 µm wide × 25-200 µm long and often coiling in host cell, content vacuolate converting to single sporangium or 1-4 resting spores. SPORANGIUM: content of thallus becomes finely granular and either extruded through discharge tube to exterior of root where zoospores develop in a vesicle, or zoospores formed inside sporangium and released into host cell following collapse of sporangium wall. ZOOSPORE: when free swimming reniform to pyriform, 6-8 × 9-11 µm, biflagellate, anterior hairy flagellum 12-14 µm long, posterior whiplash flagellum 19-21 µm, when inside host cells generally globose, 8-10 µm and sluggish in movement. RESTING SPORE: in epidermal cells globose, 7-18 µm diam., occasionally ellipsoid up to 14 × 26 µm, with wall 1-2 µm thick, in root hairs generally ellipsoid, 6-8 × 10-12 µm.

HOSTS: *Agropyron repens* (L.) Beauv., *Agrostis alba* L., *Amaranthus retroflexus* L., *Anthemis cotula* L., *Avena sativa* L., *Beta vulgaris* L., *Brassica rapa* L., *Bromus inermis* Leyss., *Capsella bursa-pastoris* (L.) Medic., *Cerastium vulgatum* L., *Chenopodium album* L., *Dactylis glomerata* L., *Echinochloa crus-galli* (L.) Beauv., *Fagopyrum esculentum* Moench., *Hordeum jubatum* L., *Hordeum vulgare* L., *Impatiens capensis* Meerb., *Poa pratensis* L., *Polygonum aviculare* L., *Polygonum convolvulus* L., *Portulaca oleracea* L., *Spinacia oleracea* L., *Taraxacum officinale* Weber, *Thlaspi arvense* L., *Triticum aestivum* L., and *Zea mays* L.

DISTRIBUTION: Nova Scotia, Prince Edward Island, Quebec, Ontario, Manitoba, Alberta.

COLLECTIONS EXAMINED: Frozen cultures on wheat from Ottawa and on barley from Winnipeg are being stored at DAOM in liquid nitrogen, vapour phase.

NOTES: This Oomycete is an obligate parasite in roots of many monocots and dicots. It is both a common root parasite, and widely distributed in North America (Barr, D.J.S. & Slykhuis, J.T., Can. Plant Dis. Surv. 56: 77-81, 1976) and Europe (Macfarlane, I., Trans. Brit. Mycol. Soc., 55: 113-116, 1970). However, it is very rarely reported because it can be easily mistaken for *Pythium* spp., and is not isolated with other fungi during root or soil studies using plating techniques. It is a primary invader of roots but does not appear to cause root necrosis in the absence of other fungi.

Although an obligate parasite, it can be readily maintained in the absence of other root parasitic fungi on roots of plants grown in sand or vermiculite (Barr, D.J.S. & Désaulnier, N.L., Can. J. Bot., 65: 2161-2176, 1987). Ultrastructural studies of the zoospore and life cycle of the isolate from wheat have been reported elsewhere (Barr & Désaulniers, loc. cit. and Can. J. Bot. 67: 813–824, 1989, respectively).

The host range listed above is from the author's observations of fungi morphologically like *L. radicicola* during surveys for obligately parasitic root fungi. Host range tests with cultures from wheat and barley have shown a restricted host range limited to these two species with very slight infection occurring on oats and *Zea mays*. This is inconsistent with survey observations. Thus, critical culture studies are required of isolates from other plant species to determine whether there is a single species with host-specific biotypes, or perhaps more than one species. The genus is monotypic, and classified in the Lagenidiales.

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