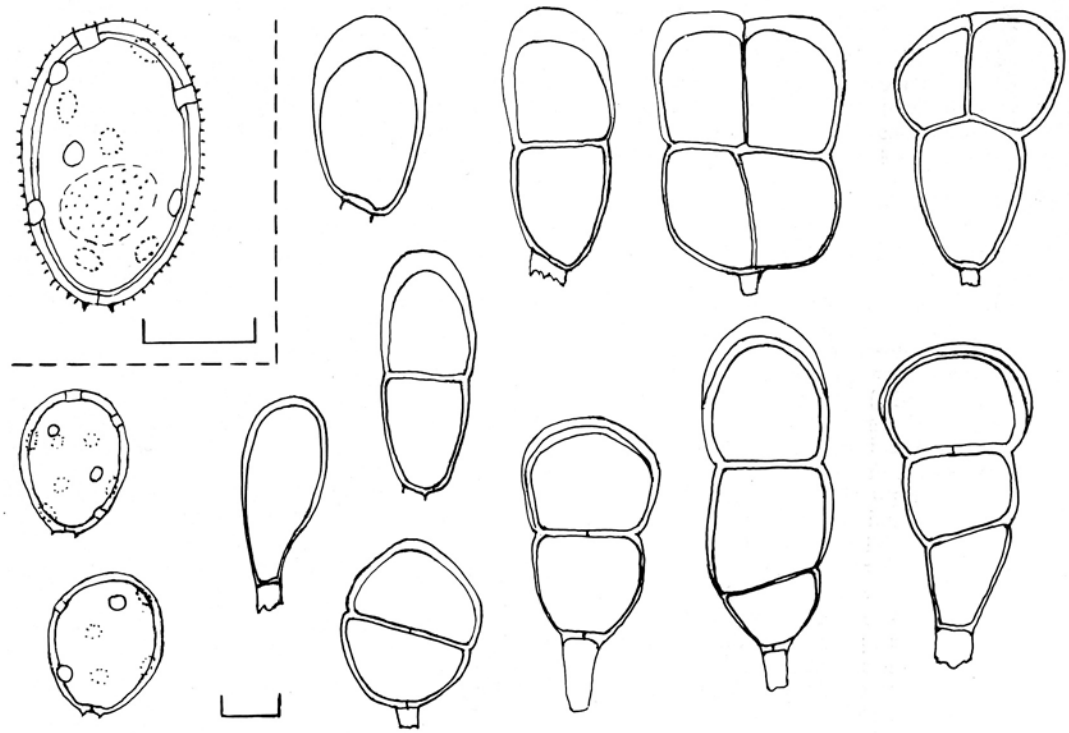
PUCCINIA STRIIFORMIS



Left, urediniospores, uppermost enlarged to show bilaminate wall and echinulae; center, normal teliospores; right, 3- and 4-celled teliospores often found in south-central Alberta. All from DAOM 153150. Scales = 10μm.

Puccinia striiformis Westend., Bull. Roy. Acad. Belg., Cl. Sci., 21: 235. 1854.
= *P. glumarum* Erikss. & Henn., Z. Pflanzenkr. 4: 197. 1894.

PYCNIA and AECIA unknown. UREDINIA and TELIA on *Triticum* and other Triticeae. UREDINIA small, often crowded, tardily naked, pale to bright yellow when fresh (paling as cytoplasmic pigment fades), occasionally with few thin-walled paraphyses, mainly adaxial, on narrow chlorotic streaks (but may be scattered on emergent blade tips or seedling leaves). UREDINIOSPORES 26-30(-33) × 18-24.5(-26.5)μm; wall (0.8-)1.0-1.8μm, hyaline (to subhyaline), often visibly bilaminate but usually lacking pigment in inner layer; echinulae (0.2-)0.3-0.5(-0.6)μm diam. and (0.8-)1.0-2.3μm between centers; germ pores often obscure, scattered, ?7-13(-15), very slight internal ring and no appreciable cap. TELIA mainly abaxial or on sheaths, long covered by epidermis, plumbeous, elongate, with light to moderate orange-brown stroma and orange-brown fused paraphyses ca. 50-70μm long, dividing sorus into locules. TELIOSPORES occasionally 1-celled (28-34 × 11-15.5μm) or irregularly 3- or 4-celled, but typically 2-celled and 30-60(-65) × (13-)14-27(-30)((-33))μm, usually slightly constricted at septum, irregularly clavate or fusoid, rarely subcylindrical, often with 1-3 faint longitudinal ridges; wall 0.6-1.0μm min. and subhyaline in lower cell, 2.5-7.5μm at apex and yellow-brown often visibly bilaminate, if apex subtruncate occasionally with few bumps to 1.0(-1.5)μm high or rarely 1-3 subdigitate appendages to 4.0μm high; no germ pores; hilum orange-brown; pedicel pale to deep yellow, rarely to 16μm long.

HOSTS: Numerous Triticeae.

DISTRIBUTION: Nova Scotia, Saskatchewan, Alberta, British Columbia.

COLLECTIONS (selected): *Aegilops* sp: **Sask.**: Saskatoon, DAOM 153126 (Newton). *Agropyron cristatum* (L.) Gaertn.: **Alta.**: Edmonton, 153151, 153152 (Sanford). *Elymus glaucus* Buckl. vars.: **B.C.**: N

Saanich, 118741 (Jones); W Saanich, 153122 (Newton); Saanichton, 153154 (Newton); Victoria, 153149 (Newton); Dewdney, 118742 (Jones). *Elymus hirsutus* Presl: **B.C.**: Mill Bay, 153119 (Newton). *Elytrigia* (*Agropyron*) *dasystachya* (Hook.) Löve & Löve: **Alta.**: (no locality), 542, (Sanford); Edmonton, 153133 (Sanford). *Elytrigia repens* (L.) Nevski: **Alta.**: Edmonton, 153131 (Sanford). *Elytrigia smithii* (Rydb.) Nevski: **Alta.**: Edmonton, 153128, 153129 (Sanford); Craigmyle, 4182 (Brinkman). *Hordeum brachyantherum* Nevski: **B.C.**: Sardis, 19975 (Jones). *H. depressum* (Scribn. & Sm.) Rydb.: **B.C.**: Victoria, 154744 (Newton). *H. jubatum* L.: **Alta.**: Edmonton, 182896 (Fraser); Cooking L., 97451 (Moss); Vegreville, 153114 (Newton); Marwayne, 153402 (Sanford); Olds, 153121 (Newton); Craigmyle, 4095 (Brinkman); Claresholm, 543 (Sanford); **Sask.**: Peterson, 70156 (Russell); Regina, 153127 (Newton); Robsart, 152113 (Sallans). *Roegneria* (*Agropyron*) *trachycaula* (Link) Nevski: **Alta.**: Edmonton, 154006 (Sanford); Mundare, 153153 (Sanford); Hobbema, 153135 (Newton); Lacombe, 156406 (Newton); Red Deer, 156006 (Newton). *Triticum aestivum* L.: **B.C.**: Sidney, 150340 (Newton); Armstrong, 4194a (Woolliams); Creston, 23238 (Sharpe); **Alta.**: Edmonton, 164866 (leg.?); Olds, 153150 (Newton); Lethbridge, 153999 (leg.?); **Sask.**, 130 (Sallans); **Man.**: Winnipeg greenhouse culture ex Olds, 163 (Sanford); **N.S.**: Cambridge, DAOM 164899 (leg.?).

NOTES: The above description is based on available Canadian material and many specimens from other countries on 25 species in 9 genera of Triticeae. A population from south-central Alberta with frequent 3- or 4-celled teliospores (right side of illustrations) is recorded on *Elytrigia smithii*, *Hordeum jubatum*, *Roegneria trachycaula* (twice) and *Triticum aestivum*, further confirming that wild grasses may serve as a reservoir to infect wheat. *Elytrigia* and *Roegneria* are here segregated from *Agropyron*, because work by Baum (in press) confirms that they are closer to *Triticum* than to *Agropyron*, which in turn seems closer to *Elymus* etc. *Puccinia striiformis* is so wide-ranging that it gives no clue to host relationships; but some other rusts do tend to support the above segregates.

Puccinia striiformis requires cool, moist conditions and is scarce in Canada except in British Columbia and Alberta. Uredinia often predominate even in mid October. In low-latitude montane regions it may occur freely on barley, *Hordeum vulgare*. Although trace infections have been reported in British Columbia (Conners, 1967. Annotated Index of plant diseases in Canada) no specimens are available. No information is available on the single Nova Scotia specimen. The genetic relationships of rusts on grasses in other tribes, assigned to *P. striiformis*, are in doubt.

D.B.O. Savile

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