PUCCINIA SORGHI

Figs.1-3 *Puccinia sorghi* on *Zea mays*, DAOM 153086; 1, uredinia (arrows) and telia, ×20; 2, urediniospores; 3, teliospores with thick walls and long firm pedicels. Figs.4-5 *Puccinia polyspora* on *Zea mays*, DAOM 181752 = PUR 53111 (see notes); 4, urediniospores; 5, teliospore with thin walls. Scale for 2,3,4,5, = 10μm.

Puccinia sorghi Schw., Trans. Amer. Phil. Soc., II, 4: 295. 1832.
= *Puccinia maydis* Béreng., Atti Sci. Ital. 6: 475. 1845.

= *Puccinia zeae* Béreng. in Klotsch, Herb. Viv. Mycol. Suppl. No. 18. 1851.

PYCNIA and AECIA: on *Oxalis* but not known in North America (see notes). UREDINIA amphigenous to mainly adaxial, long covered by split epidermis, spore mass golden brown. UREDINIOSPORES (22-)23-31(-33) × (20-)21-28μm, globose to short-ellipsoid; wall 1.3-2.3μm minimum, with light yellow to medium yellow-brown outer and deep yellow-brown to chestnut inner layer, 2.0-3.3μm and paler at base, completely echinulate with spines to 1.0μm high, 0.3-0.6μm diam., 1.0-2.5(-2.8)μm between centers; hilum ca. 5-8μm diam., always verruculose with verrucae ca. 0.2-0.3μm diam. and 0.5-0.7μm between centers; germ pore number varying, either 3 or 3-4((-5)), usually nearly equatorial, occasionally irregular or one near the apex, with a moderate to strong or rarely slight internal ring and usually small cap occasionally 1.0(-1.5)μm high. TELIA amphigenous or mainly adaxial, usually linear, strongly erumpent, soon naked and spore mass black. TELIOSPORES rarely one-celled; 2-celled spores (27-)30-48(-53) × 15-27(-29)μm (mainly) slightly constricted, rarely unconstricted or moderately constricted, ellipsoid to obovoid or broadly clavate; wall 1.0-2.3μm min. in lower cell, 3.0-8.5μm at apex, smooth or rarely with 1-2 inconspicuous ridges, outer layer medium to deep yellow-brown, thin chestnut middle layer, and thin innermost pale layer (often scarcely distinguishable from cytoplasm); upper germ pore with conspicuous nearly central dimple, lower pore inconspicuous but apparently at septum; pedicel persistent, 18-95((-120))μm long, yellow at both ends, but subhyaline in mid part if long, either basal or slightly (or moderately offset).

HOST: *Zea mays* L.

DISTRIBUTION: Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan.

COLLECTIONS (selected): **N.S.**: Pictou Co., Pictou, 18 Oct. 1909, DAOM 13008 (Mane). **Que.**: Cté. Kamouraska, La Pocatière, Sept. 1938, DAOM 5653 (Anselm); Cté. Jacques Cartier, Ste. Anne de Bellevue, 28 Oct.1926, DAOM 154064 (Machacek); Cté. Gatineau, Cantley, 4 Sept. 1981, DAOM 180635 (Ginns 6334). **Ont.**: Carlton Co., Ottawa, 6 Sept 1932, DAOM 3416 (Güssow); Dundas Co., Winchester, 8 Sept. 1981, DAOM 180633 (Seaman); York Co., Maple, 24 Aug. 1941, DAOM 82775 (Darker); Brant Co., New Durham, 27 Sept. 1930, DAOM 78705 (Cain); Lincoln Co., Vineland, 4 Sept. 1931, DAOM 6830 = TRTC 16107 (Bailey); Middlesex Co., nr. London, 24 Oct. 1946, DAOM 132493 (Dearness); Essex Co., Harrow, 28 Aug.1950, DAOM 25467 (Parmelee); Cochrane Dist., Kapuskasing, 14 Aug. 1935, DAOM 4039 (Scott). **Man.**: Man. Agr. Coll., Aug.1921, DAOM 153086 (Brown); Libau, 15 Aug. 1938, DAOM 5405 (Howe). **Sask.**: Indian Head, 30 Sept. 1924, DAOM 136 (Simmonds).

NOTES: *Puccinia sorghi* was so named because Schweinitz thought he had *Sorghum* leaves. The lectotype was labelled *Puccinia sorghi* but "& *Zea*" was later added. However all the leaves are of *Zea* (Arthur and Bisby, 1918. Proc. Am. Philos. Soc. 57: 73-292). There is no record of this rust on *Sorghum*. The earliest Canadian collection is one by Dearness (Species No. 190) taken in his garden [London, Ont.] 18 Aug. 1890. Although widely reported in Canada, corn rust rarely causes severe loss to the crop. Conners (Agr. Can., Res. Br. Publ. 1251, 1967) reports an epidemic outbreak in southern Ontario in 1950. Distribution in P.E.I. and N.B. is based on Conners (op. cit.) as there are no specimens in DAOM. The aecial state on *Oxalis* is not known in North America. The following notes are taken from greenhouse cultures at Macdonald College, Ste. Anne de Bellevue, Que. (DAOM 191557) and University of Michigan, Ann Arbor, Mich. (DAOM 6563): PYCNIA and AECIA on *Oxalis*; PYCNIA amphigenous, AECIA mainly abaxial, cupulate. AECIOSPORES 17-22.5 × 16-20μm; wall 0.6-0.8μm excluding verrucae, hyaline; verrucae ca. 0.3-0.5μm high, 0.2-0.5μm diam., 0.4-0.8(-1.0)μm between centers, uniform (type 1 spores) , germ pores invisible.

Although *Puccinia sorghi* is the only rust of *Zea* recorded in Canada, *P. polyspora* Underw., has been recorded on *Zea* as far north as Indiana and should be watched for in southern Canada. It is illustrated from results of greenhouse inoculations using material originating from Mississippi. The main distinctions between *P. sorghi* and *P. polyspora* are tabulated herewith. If only uredinia are available, attention must be given to pore and hilum characters, because a few specimens of *P. polyspora* have relatively short spores.

The three known rusts of *Zea* are compared in detail in Chapter 3, vol. I of The Cereal Rusts (Bushnell and Roelfs, *eds.*, 1984).

Comparison of Spore Characters in *Puccinia sorghi* and *P. polyspora*

	P. sorghi	*P. polyspora*
Urediniospores		
shape	usually globoid	usually ellipsoid
max. length	30(-33)μm	(35-)37-40(-44)μm
pores	3-4(-5) with internal ring	(3-)4-6(-7) slight or no internal ring
hilum	rugulose	smooth
Telia	pulvinate, soon naked, black	locular, long covered, plumbeous
Teliospore apex	3.5-8.0μm thick	1.5-4.0μm thick
Pedicel	18-95(-120)μm, firm	8-38μ, delicate

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