



1, 2, Urediniospores 1-celled with 2 superequatorial germination pores, and teliospores 2-celled with pores inconspicuous in the illustration but discernible (arrowheads), from DAOM 130305. 1, median plane focus; 2, surface focus.

***Puccinia balsamorhizae*** Peck, Bull. Torr. Bot. Club 11: 49. 1884.  
 = *Trichobasis balsamorhizae* Peck, Bull. Torr. Bot. Club 6: 276. 1881.  
 = *Trichobasis wyethiae* Peck, Bot. Gaz. 7: 45. 1882.

PYCNIA subepidermal, amphigenous, costal, flask-shaped. AECIA absent. UREDINIA - (primary) amphigenous, brown, costal, associated with pycnia, pulverulent; - (secondary) amphigenous, brown, laminar, scattered, pulverulent. UREDINIOSPORES globose, broadly obovoid, or narrowly ellipsoid, flattened,  $25-36.8 \times 19-32\mu$ ; wall yellow-brown,  $1.6-3.2\mu$  thick, finely echinulate except bare area below pores; pores 2, superequatorial to equatorial. TELIA amphigenous, dark brown, localized, pulverulent. TELIOSPORES narrowly to broadly ellipsoid with rounded ends, not or slightly constricted at septum,  $29-43.2(-51.5) \times 19.2-27.2\mu$ ; wall red-brown  $1.6-3.2\mu$  thick, densely shallowly verrucose, warts  $0.7-1.4\mu$  diam. and  $0.7-1.4\mu$  spacing; pore 1 apical to slightly depressed in upper cell, and 1 half depressed to nearly basal in lower cell; pedicel hyaline, fragile.

HOST: *Balsamorhiza saggitata* (Pursh) Nutt. (Compositae, Heliantheae).

DISTRIBUTION: B.C. only. Wardner and Vernon west to Summerland and Alexis Creek on the Chilcotin Plateau.

COLLECTIONS: on *Balsamorhiza saggitata*: B.C.: Wardner, 21 July 1969, DAOM 130305; Creston, 17 June 1953, 113399; Salmo, Sept. 1915, Barth., N. Amer. Ured. 2142; Vernon, in PUR 37597; Bridesville, June 1953, 113410; Summerland, 25 June 1953, 113409 and 20 Aug. 1939, 77177; Kamloops, 17 June 1889, 151636 and 1 June 1953, 113412; Heffley, 15 June 1956, 113401; Alkali Lake, 14 July 1956, 113413 and 7 June 1956, 113402; Merrit, 29 May 1956, 113403; Ashcroft, 25 May 1956, 113397; Pavillion, 5 Sept. 1956, 113398; Jesmond, 20 June 1956, 113414; Williams Lake, 1 July 1953, 13408; Riske Creek, 18 July 1956, 113400.

NOTES: The lectotype is PUR 37548 on *Balsamorhiza macrophylla* Nutt., Salt Lake City, Utah, M.E. Jones, May 1881. The first Canadian collection is from Kamloops, made in 1889 by John Macoun.

Although the host plant, *B. saggitata*, is known in southwestern Alberta, the rust has not been recorded from there. It is known to occur in the states south of Alberta-British Columbia extending to Colorado and California on other *Balsamorhiza* spp. The closely related *Wyethia* also bears this rust and there is much overlap in the range of the hosts to permit cross inoculation between them. *Wyethia* is not known in Canada.

Spore characters of *P. balsamorhizae* are somewhat like those of *P. mirifica* Diet. & Holw. which attacks species of *Borrchia*. *Borrchia* is limited to southeastern U.S.A. (and Texas) and the two rusts therefore do not occur together. However, on rust characters alone, they can be differentiated. *P. mirifica* has systemic telia, and the teliospores are slightly larger with thicker walls having more widely spaced verrucae. (Parmelee, J.A. The autoecious species of *Puccinia* on Heliantheae in North America. Can. J. Bot. 45: 2267-2327. 1967.).

*Balsamorhiza saggitata* is a perennial with a deep-seated, woody taproot and it is well-suited to the dry open hillsides and flats of moderate elevations such as found in the Okanagan, Fraser and Chilcotin regions of B.C. In some locations it has become a formidable weed taking over large open grazing areas. Rust on the leaves can be severe enough to cause some disruption in photosynthesis, but severe incidence usually does not occur until the growing season is well advanced, in effect negating possible host control by the fungus.

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