Rust of European blackberry - *Phragmidium bulbosum*

Although relatively common in Europe and also found in Asia, this rust does not attack economically important species of *Rubus* and thus does not appear to be threat to the berry industry in North America.

*Phragmidium bulbosum* (F. Strauss) Schltdl. 1824

**Spermogonia** epiphyllous (on upper surface of leaves), aggregated in minute groups opposite aecia, indefinite, becoming fused, subcuticular, 25-30 µm high.

**Aecia** hypophyllous (on lower surface of leaves), caeomoid, circular or annulate, up to 1 mm diam, orange, paraphysate; aeciospores globose to broadly ellipsoid, 25-22 × 23-16 µm, wall hyaline, coarsely verrucose with broad shallow warts up to 3 µm diam, 1.5-2 µm thick, pores obscure.

**Uredinia** hypophyllous, irregularly scattered without spots or on small reddish, yellowish, brownish, or purplish spots, occasionally on larger purplish blotches, 0.1-0.3 mm diam, yellowish, paraphysate. Urediniospores obovoid to ellipsoid, 19-24 × 16-18 µm, wall hyaline, coarsely echinulate, spines 1-2 µm apart, 0.5 µm high, 1-2 µm thick, pores 2.5-4 µm diam, obscure. Paraphyses cylindric-clavate, incurved, 40-60 × 8-13 µm, wall thickened to 2-3 µm at apex.

**Telia** scattered or aggregate, minute, round or irregular, black. Teliospores cylindric, not constricted at septa, apex rounded and with a blunt apiculus, up to 13-19 long × 5-7 µm wide, 4-7 celled, dimensions excluding apiculus: 4-celled 59-71 × 30-37 µm, 5-celled 73-89 × 32-37 µm, 6-celled 86-104 × 32-37 µm, 7-celled 98-111 × 32-36 µm; wall sienna to dark amber brown, verrucose, 4-5 µm thick, pores 2-4 in each cell; pedicels 75-160 long, 7-10 µm wide at neck, swollen below to 13-19 µm wide.


**Host range:** Primarily reported on *Rubus* subgenus *Rubus*, specifically *R. caesius* (European dewberry), *R. canescens*, *R. grabowskii*, *R. hirtus*, *R. hispidus*, *R. montanus*, *R. plicatus*, *R. praeox*, *R. sanctus*, *R. ulmifolius*, *R. vestitus*, and *R. idaeus* (raspberry), as well as a few other hosts, although some may be misidentifications.

**Geographic distribution:** Asia (China, Iraq, Pakistan); Europe (widespread).

**Notes:** Although this rust attacks a wide range of species of *Rubus*, none are closely related to economically important species. One host, *Rubus vestitus*, is a weedy plant that has become naturalized in the USA (OR, WA). Among those species of *Phragmidium* on *Rubus* that exist primarily outside of North America but in Europe are *P. acuminatum*, *P. arcticum*, and *P. bulbosum*. *Phragmidium arcticum* occurs only at northern latitudes including in northern Canada. *Phragmidium acuminatum* and *P. bulbosum* can be distinguished by finely echinulate urediniospores of *P. acuminatum* versus the coarsely echinulate urediniospores of *P. bulbosum*. One of the other species of *Phragmidium* on *Rubus* in Europe, *P. rubi-idaei*, is widespread in North America. *Phragmidium violaceum* known primarily from Europe, Africa, and introduced into Australia as a biocontrol agent, was recently discovered in western North America.

**References:**


Petrova, R.D., and Denchev, C.M. 2004. A taxonomic study of Phragmidiaceae (Uredinales) in


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Teliospores of *Phragmidium bulbosum* on *Rubus caesius* x40

Urediniospores of *Phragmidium bulbosum* on *Rubus caesius* x40

Telia of *Phragmidium bulbosum* on *Rubus caesius* x4