CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Profile for

Globisporangium mastophorum (Drechsler) Uzuhashi, Tojo & Kakish., 2010

Root rot of celery and parsley

Pest Rating: C

Domain: Eukaryota, Kingdom: Chromista,
Phylum: Oomycota, Class: Oomycetes,
Order: Peronosporales, Family: Peronosporaceae

Comment Period: 09/22/2025 through 11/06/2025

Initiating Event:

This pathogen has not been through the pest rating system. The risk to California from *Globisporangium mastophorum* is evaluated herein, and a permanent rating is proposed.

History & Status:

Background:

The genus *Pythium* belongs to the family Pythiaceae, order Pythiales, class Oomycetes, phylum Oomycota, and kingdom Chromista. Pythiums are widely distributed throughout the world, amphibious and ubiquitous, occupying several ecological niches (van der Plaats-Niterink, 1981). Some species are phytopathogens, causing rot of fruit, roots, and stems, as well as pre- or postemergence damping-off of seeds and seedlings.

Current and former *Pythium* and *Pythium*-like species cause damping-off symptoms on umbelliferous crops. Phylogenetically, the genus *Pythium* is a highly divergent group. It was divided into five well or moderately supported monophyletic clades. Each clade is characterized by sporangial morphology such as globose, ovoid, elongated, or filamentous shapes. Based on phylogeny and morphology, the genus

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Pythium (s. str.) was emended, and *P. mastophorum* was re-classified as *Globisporangium mastophorum* by Uzuhashi et al., 2010

The first report of a root rot of celery caused by *Globisporangium* (*Pythium*) *mastophorum* in North America was made from samples collected in Ventura County (Vazquez et al., 1996). Additional detections have been made on parsley and celery in Santa Barbara County (CDFA PDR database, 2025; Tsuchida et al., 2018).

Hosts: Alisma plantago-aquatica (common water-plantain), *Apium graveolens* (celery), *Apium graveolens* var. *rapaceum* (celeriac), *Bellis perennis* (common daisy), *Calceolaria* sp. (slipper flower), Fragaria x ananassa (strawberry), *Petroselinum crispum* (parsley), and *Pinus radiata* (Monterey pine) (Farr and Rossman, 2025; Eden and Hill, 1998).

Symptoms: Infected celery suffers from stunted growth, yellowing, decayed roots, and damping-off (Zajc et al., 2024). On greenhouse-grown celery seedlings, infected plants were stunted and yellow, with discolored taproots and decayed feeder roots (Vazquez et al., 1996). Parsley plants infected with *G. mastophorum* were stunted, wilted, and had chlorotic foliage. The large taproots were discolored, and small feeder roots were sparse and necrotic (Tsuchida et al., 2018).

Transmission: Globisporangium is transmitted via contaminated water, soil, and contaminated tools and equipment, through the movement of infected plant parts, and occasionally by insects such as fungus gnats and shore flies. In wet conditions, including saturated soils, flagellated zoospores are released. These can also travel in surface water, run-off, and irrigation water. Thick-walled oospores overwinter in the soil and on contaminated equipment (Agrios, 2005). It is not seed-borne.

Damage Potential: Infected celery plants grow slowly, resulting in a delay in transplanting to the field. In inoculation studies, *G. mastophorum* caused severe root rot in 53% of parsley seedlings (Petkowski et al., 2013). Inoculated celery had fresh weights approximately one-third of the weights of the control plants, with severe discoloration of the tap roots and loss of most of the feeder roots. Several of the plants died (Vazquez et al., 1996).

Worldwide Distribution: Australia, Czechia, New Zealand, Poland, Slovenia, United Kingdom, United States (California, Wisconsin) (Farr and Rossman, 2025; Zajc et al., 2024).

Official Control: none

California Distribution: Santa Barbara and Ventura counties.

California Interceptions: none

The risk *Globisporangium mastophorum* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This pathogen is likely to be found wherever its hosts are grown.

   Evaluate if the pest would have suitable hosts and climate to establish in California.

   Score: **2**

   - Low (1) Not likely to establish in California; or likely to establish in very limited areas.
   - Medium (2) may be able to establish in a larger but limited part of California.
   - High (3) likely to establish a widespread distribution in California.

2) **Known Pest Host Range:** The host range is mainly plants in the family Umbelliferaceae, with reports from other families.

   Evaluate the host range of the pest.

   Score: 2

   - Low (1) has a very limited host range.
   - Medium (2) has a moderate host range.
   - High (3) has a wide host range.

3) **Pest Reproductive Potential:** *Globisporangium* has multiple spore types, including motile zoospores. It can be spread with soil and water.

   Evaluate the natural and artificial dispersal potential of the pest.

   Score: 2

   - Low (1) does not have high reproductive or dispersal potential.
   - Medium (2) has either high reproductive or dispersal potential.
   - High (3) has both high reproduction and dispersal potential**.**

4) **Economic Impact:** There are reports of damage to celery and parsley in California.

   Evaluate the economic impact of the pest to California using the criteria below.

   Economic Impact: A, G

   A. The pest could lower crop yield.
   B. The pest could lower crop value (includes increasing crop production costs).
   C. The pest could trigger the loss of markets (includes quarantines).
   D. The pest could negatively change normal cultural practices.
   E. The pest can vector, or is vectored, by another pestiferous organism.
   F. The organism is injurious or poisonous to agriculturally important animals.
   G. The organism can interfere with the delivery or supply of water for agricultural uses.

Economic Impact Score: **2**
- Low (1) causes 0 or 1 of these impacts.
- Medium (2) causes 2 of these impacts.
- High (3) causes 3 or more of these impacts.

5) **Environmental Impact:** Monterey pine, *Pinus radiata*, is native and widespread in coastal California. This disease can cause seedling death.

Evaluate the environmental impact of the pest to California using the criteria below

Environmental Impact:
A. **The pest could have a significant environmental impact such as lowering biodiversity,** disrupting natural communities, or changing ecosystem processes.
B. The pest could directly affect threatened or endangered species.
C. The pest could impact threatened or endangered species by disrupting critical habitats.
D. The pest could trigger additional official or private treatment programs.
E. The pest significantly impacts cultural practices, home/urban gardening or ornamental plantings.

Environmental Impact Score: 2
- Low (1) causes none of the above to occur.
- Medium (2) causes one of the above to occur.
- High (3) causes two or more of the above to occur.

Consequences of Introduction to California for*:* Medium

Add up the total score and include it here. **10**
-Low = 5-8 points
-Medium = 9-12 points
-High = 13-15 points

6) **Post Entry Distribution and Survey Information**: Evaluate the known distribution in California. Only official records identified by a taxonomic expert and supported by voucher specimens deposited in natural history collections should be considered. Pest incursions that have been eradicated, are under eradication, or have been delimited with no further detections should not be included.

Evaluation is 'low'.
Score: -1
-Not established (0) Pest never detected in California or known only from incursions.

-Low (-1) Pest has a localized distribution in California or is established in one suitable climate/host area (region).
-Medium (-2) Pest is widespread in California but not fully established in the endangered area, or pest established in two contiguous suitable climate/host areas.
-High (-3) Pest has fully established in the endangered area, or pest is reported in more than two contiguous or non-contiguous suitable climate/host areas.

7) **The final score is** the consequence of the introduction score minus the post-entry distribution and survey information score: (Score)

Final Score: *Score of Consequences of Introduction – Score of Post Entry Distribution and Survey Information* ***= 9***

Uncertainty:

Damping off (death of very young plants) is a common disease caused by this pathogen and others that are closely related. The specific causes of damping off are not always delimited, especially when it occurs pre-emergence. It is likely this disease is more widespread in California than is currently reported.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for *Globisporangium mastophorum* is C.

References:

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Petkowski, J.E., De Boer, R.F., Norng, S., Thomson, F. and Minchinton, E.J., 2013. Pythium species associated with root rot complex in winter-grown parsnip and parsley crops in south eastern Australia. Australasian Plant Pathology, 42(4), pp.403-411.

Tsuchida, C.T., Mauzey, S.J., Hatlen, R., Miles, T.D. and Koike, S.T., 2018. First report of Pythium root rot caused by *Pythium mastophorum* on parsley in the United States. *Plant Disease*, *102*(8), p.1671.

Uzuhashi, S., Kakishima, M. and Tojo, M., 2010. Phylogeny of the genus *Pythium* and description of new genera. Mycoscience, 51(5), pp.337-365.

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Vazquez, M.R., Davis, R.M., and Greathead, A.S., 1996. First report of *Pythium mastophorum* on celery in California. Plant Disease, vol. 80, p. 709

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Responsible Party:

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*Comment Period: 09/22/2025 through 11/06/2025

*NOTE:

You must be registered and logged in to post a comment. If you have registered and have not received the registration confirmation, please contact us at permits[@]cdfa.ca.gov.

Comment Format:

- Comments should refer to the appropriate California Pest Rating Proposal Form subsection(s) being commented on, as shown below.

  Example Comment:

  Consequences of Introduction: 1. Climate/Host Interaction: [Your comment that relates to "Climate/Host Interaction" here.]

- Posted comments will not be able to be viewed immediately.
- Comments may not be posted if they:

  Contain inappropriate language which is not germane to the pest rating proposal;

Contains defamatory, false, inaccurate, abusive, obscene, pornographic, sexually oriented, threatening, racially offensive, discriminatory or illegal material;

Violates agency regulations prohibiting sexual harassment or other forms of discrimination;

Violates agency regulations prohibiting workplace violence, including threats.

- Comments may be edited prior to posting to ensure they are entirely germane.
- Posted comments shall be those which have been approved in content and posted to the website to be viewed, not just submitted.

Pest Rating: C