



Didymo

Didymosphenia geminata (Lyngbye) M. Schmidt, 1889
syn. *Echinella geminata* (Lyngbye) 1819, *Gomphonema geminatum* (Lyngbye) C. Agardh, 1824

ALBERTA REGULATION:
UNDESIGNATED

Last Updated: February 2018



Individual diatoms and stalks - algalweb.net



T Thorney, Bugwood.org

Overview:

Didymo or *Didymosphenia geminata* is a freshwater diatom native to North America.² Diatoms are microscopic, photosynthetic, single celled organisms which have walls made of silica; they are a common form of phytoplankton.³ The cells cannot be seen until they form a colony.¹ Diatoms are so numerous that they contribute a large portion of the global carbon budget.² The boreal regions of Europe, Asia, and North America have the earliest documented distribution of didymo.⁴

Didymo individuals attach to solid surfaces (rocks, some plants) and in favourable conditions the colony expands by the stalks coalescing to form thick, jelly-like masses covering rocky streambeds,⁴ which are called blooms. Vancouver Island, B.C., was the site of the first North American

documented 'nuisance blooms'² in 1989.⁴

The cause or causes of *D. geminata* nuisance blooms are not well understood. Low phosphate levels have been associated with blooms² but other possible causes suggested are a genetic variant with broader ecological tolerances, increased exposure to UV radiation has reduced grazers of didymo, or perhaps climate change.¹ Since diatoms have precise ecological requirements, they may serve as indicators of environmental change.³

Habitat:

D. geminata prefer freshwater rivers, streams, and lakes with low organic content and high oxygen content, such as montane or boreal streams.¹ It requires high light conditions and prefers a stable flow. Didymo also prefers neutral pH but thrives where

there is some calcium.¹ It occurs mostly in shallow waters but can colonize deeper waters, which have high light.¹

Identification:

Colonies are brown and have a slimy appearance. The thick mats of blooms form flowing tails, which are pale-yellow to white. It feels like wet wool, has no distinctive odour, strongly attaches to stones or aquatic plants, and does not fall apart if rubbed.¹

Ecology:

Colonies begin by the diatom cells attaching to rocks or other substrate² by stalks extruded from the cells.⁴ Colonies grow in a forking manner which produces a hemispherical shape.⁴ At this stage the colonies form small circular lumps 2-10 mm in diameter and are common in late



Didymo (continued)

winter.² Colonies merge as they grow, eventually covering the substrate and becoming thicker. On plants the colonies form rope like strands.²

Blooms form during low water flow or favourable growing conditions and stalk production greatly increases forming white to grey strands. The strands can feel like tissue or wet wool.² After a bloom subsides the stalks may persist for 2 months or more and may change colour from trapping sediment and drying.²

Economic Impacts:

Impacts to sportfishing and tourism would affect local economies. Some canals in North America must be mechanically cleaned² and water intakes could also be impacted.¹

Environmental Impacts:

Reduction in salmonid rearing habitat, which could reduce habitat for other diatoms. Water flow restriction and depletion of dissolved oxygen from the decomposition of nuisance blooms could also impact native habitats.¹

Sociological Impacts:

Loss of native species and transformation of aquatic communities results in the intrinsic loss of natural capital and enjoyment of natural areas, including recreational activities.

Prevention:

Didymo cells lack any form of movement so dispersal can only occur by cells being transported to new habitats. Only one single live cell is required to establish and spread

since reproduction is by cell division.² The felted soles of waders worn by anglers are particularly susceptible to transporting *D. geminata* to a new habitat.⁴ Do not move fish or plants from an affected water body to an unaffected one.¹

Never empty your aquarium into natural water bodies

Control:

Sanitary - Remove all visible clumps of algae when leaving a water body and leave at the affected site. Any clumps found after should be disposed of in landfill-bound garbage - do not wash down a drain. Soak and scrub all items in hot water (60°C), a 2% solution of bleach, or antiseptic hand cleaner or dishwashing soap. If washing is not feasible then items must be allowed to be completely dry for at least 2 days.¹



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Didymo *(continued)*

REFERENCES:

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3. Diatoms Online. What is a diatom? <http://diatoms.myspecies.info/node/8> Accessed October 10, 2016.
4. Bothwell, et. al. 2009. On the Boots of Fishermen: The History of Didymo Blooms on Vancouver Island, British Columbia. *Fisheries*. Vol. 34, No. 8, August 2009. pp. 382 to 388. www.fisheries.org Accessed: October 5 2016.