Metabolism and Ecology of the Water Mould, *Leptomitus lacteus* (Oomycota), Blooming in Winter in a Nova Scotia Stream

Barry R. Taylor[1], David J. Garbary[1], Anthony Miller[1], and **Felix Bärlocher[2]**

Authors' addresses: [1]Department of Biology, St. Francis Xavier University, Antigonish, NS, B2G 2W5, Canada; [2]Department of Biology, Mt. Allison University, Sackville, NB, E4L 1E3, Canada

Abstract: The water mould *Leptomitus lacteus* bloomed in a small stream in northern Nova Scotia, Canada, for at least four months from December through March when water temperatures were near 0°C and the stream was frequently ice-covered. The bloom occupied much of the substratum along 1.5 km of stream below the effluent outfall from a composting facility. A true fungus, *Saprochaete saccharophila*, was a minor component of the bloom. *L. lacteus* colonies appeared robust against freezing and regrew quickly after scouring floods. *L. lacteus* preferred riffles and fast-flowing water, evidently because of a high oxygen requirement. In mid-winter, the standing crop of *L. lacteus* approached 2.5 kg m^{-2} fresh mass, or 2000 kg along the whole length of stream. The bloom ended abruptly in April when water temperatures rose above 5°C. In the laboratory, clumps of *L. lacteus* demonstrated vigorous oxygen consumption near 0°C. Oxidative metabolism was largely confined to the outer 6 mm of the colonies, interior to which $[O_2]$ declined precipitously. Evidence suggests that *L. lacteus* blooms in winter to take advantage of a rich food source and high $[O_2]$ while avoiding competition. Similar blooms of *L. lacteus* elsewhere may be overlooked because winter weather and ice cover discourage investigations.

Keywords: *Leptomitus lacteus*, *Saprochaete saccharophila*, bloom, respiration, water mould, winter