
Effects of dry period length and vegetation on organic matter decomposition in vernal pools

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Abstract

Vernal pools are small depressions with temporary waters, common in temperate forests, natural or resulting from past human activities. These ecosystems are known as biodiversity hotspots for vegetation and fauna. In the forest of Chinon (France), we studied vernal pools characterized by the longest flooded periods of the site, a low accumulation of peat, with the presence of *Sphagnum* moss, specifically *Sphagnum palustre*, and purple-blue moor grass (*Molinia caerulea*). Vernal pools' ecological functioning is poorly studied, especially the interaction between vegetation, hydrology and organic matter decomposition.

We focused on the habitat located in the pools' edges. The dynamic of the vegetation communities and the biogeochemical functioning of this habitat is highly related to annual variations of water level. We asked if, in the edges, the organic matter decomposition was influenced by: (1) the dry period length (2) the presence of vascular plants and bryophytes. In 2015, we set up a semi-controlled in-situ experiment (mesocosms). We used the cotton strips technique as proxy for organic matter decomposition. The strips were vertically inserted in the soil and incubated during 14, 64 and 112 days. Four vegetation treatments were tested for three dry period length (0, 1.5, 3 months): *M.caerulea* and *S.palustre*, *M.caerulea* on bare soil, *S.palustre*, and bare soil. The first results showed that a dry period increased the organic matter decomposition in comparison with no dry period, without difference between 1.5 and 3 months of drought. Moreover, after 112 incubation days, we observed a decrease of decomposition when *M.caerulea* is present.

Keywords: vernal pools, organic matter decomposition, hydroperiod, cotton strips, soil

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