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## Impact of cattle grazing on peat properties and diatoms

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Peatlands are a major carbon (C) sink and represent important habitats for nature conservation because of the occurrence of specifically adapted organisms. Peatlands are typically nutrient-poor environments, and thus extremely sensitive to nitrogen (N) depositions. In fact, increasing N inputs can cause a shift from a *Sphagnum* moss- to a vascular plant-dominated vegetation as well as an alteration of the mire geochemistry which, in turn, affects the litter composition and decomposition rate. Peatland is an extremely fragile ecosystem: at the European level, >60% of this habitat type has been lost just in the last decades. In Alpine peatlands, in particular, overgrazing has been identified as a main problem for habitat integrity and biodiversity.

In the present study, six Belarus (50-cm deep) cores were collected from several peatlands located in the Adamello-Brenta Nature Park (Trentino, Italy) mirroring a grazing-induced disturbance gradient. All cores were cut frozen into 3-cm sections, and analysed for dry density, water content, pH, EC, and elemental (CHNS) composition. Diatom taphocoenoses were also determined. In particular, diatom frustules were prepared using hot hydrogen peroxide and finally mounted in the Naphrax© resin to produce permanent mounts for identifications and counts. 400 valves were counted and identified to the species level in each slide using a light microscope at x1000 magnification. The whole procedure was kept quantitative to allow the calculation of absolute abundances (n-valves/g-peat-dw).

Physical, chemical and biological parameters generally underlined how the grazing influence was clear mainly in the top 20 cm, and resulted in an increasing of density (up to 2×) and N concentration (up to 3×) as well as in a lower gravimetric water content (up to 50%). No significant differences were observed below 30 cm of depth. More than 100 diatom species were identified throughout the 6 cores investigated, and several of them are included in threat categories of the Red List for central Europe (e.g., *Cymboplectra valaiseana*, *Eunotia hexaglyphis*, *E. triodon*). Since diatoms can reflect major regional environmental gradients, they can be used as indicators of ecological conditions in peatlands. In fact, some species that are trivial (= frequent and often abundant) in mire environments in spite of being relatively rare at the overall level of European inland waters (e.g., *Aulacoseira alpigena*, *Encyonema perpusillum*, *Kobayasiella micropunctata*) were found in the cores from highly-grazed areas whilst several rare and

sensitive species were detected only (or were clearly more frequent) in cores from mildly-grazed areas.

This research can provide useful indications on the harmful effects of grazing in terms of both biogeochemical cycles and nature/habitats conservation.