



## ECOLOGICAL ANALYSIS OF PROTECTED REINDEER LICHEN POPULATIONS IN THE BALATON UPLANDS (HUNGARY)

Védett rénzuzmó populációk ökológiai elemzése a Balaton-felvidéken

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So far, 10 of the 17 protected lichen species of Hungary have been registered in the Bakony Mts including the Balaton Uplands region. A total of 46 quadrats was sampled for three protected *Cladonia* species (*C. arbuscula*, *C. mitis* and *C. rangiferina*). 11 of the 20 previously described populations were successfully confirmed, with the addition of 23 new records. Habitat preferences of three protected *Cladonia* species growing on red sandstone, basalt, Pannonian sandstone and gravel were investigated by detailed sampling. Exposure, bedrock type, soil depth, habitat type, percentage cover of stone, bryophyte, lichen, vascular plant and canopy, percentage cover value of all species (lichens, bryophytes and vascular plants), disturbance and animal impacts were recorded, soil pH and CaCO<sub>3</sub> content were measured. Altogether 154 species (42 lichens, 97 vascular plants, 15 bryophytes) were recorded in the 46 quadrats. Sporadic populations of these species mostly live in top of hills and mountains in "Open acidofrequent oak forests", but they may occur in other habitat types, such as "Closed acidofrequent oak forests", "Slope steppes on stony soils", "Siliceous open rocky grasslands", "Open sand steppes", "Nardus swards and other acidofrequent grasslands on shallow soils" and "Dry *Calluna* heaths". The conclusion of our investigation is that *Cladonia rangiferina* grows in higher canopy closure (mean 38%, max. 95%), than *C. arbuscula* (mean 26%, max. 70%) and *Cladonia mitis* (mean 15%, max. 70%) in the Balaton Uplands. Furthermore, canopy cover showed significant differences between occupied and non-occupied relevés in case of all three investigated species. *Cladonia rangiferina* is a rather good indicator species of natural and seminatural habitats in Hungary because of its narrow distribution area and its low ecological tolerance. Current results may establish introducing effective conservation methods in the future. Our work was supported by the project NKFI K 124341.