Abstract

The lichen species *Cladonia norvegica* is well known for its characteristic production of striking red spots, which, according to the opinion of most authors, is produced in response to mites grazing on the lichen. In some localities, including central Norway, where the species was described, it occurred without these red spots. In my thesis, I focused on this lichen, the mites associated with it, and their interaction.

Chemical analyses (TLC and identification of red pigment with HPLC) and phylogenetic analyses (using 42 own sequences of ITS rDNA, mtSSU and EF-1α markers) were performed on the lichen material. Mites living on the lichen thalli were extracted, and the nymphs causing the red reaction were identified by molecular analysis based on the D3 28S segment of rRNA marker, and the results were compared with a laboratory at the University of Graz. Mite adults were determined morphologically and mite communities were statistically analyzed by ANOVA and cluster analysis using Ward's method. Food preference tests were performed with the most frequently occurring mite species (*Carabodes areolatus* and *Carabodes marginatus*) on the studied lichens, which were subsequently processed by GLMM analysis.

The results of phylogenetic analyses showed that the lichens with red spots, previously classified as *Cladonia norvegica*, form a separate, undescribed species (*Cladonia* sp. nov. "*rubrotincta*"), which belongs to the Ochroleucae group. The species *C. norvegica* s. str. is morphologically and chemically similar but without the red pigment. Based on my analyses, it appears to be polyphyletic.

The juvenile stages of mites causing red spots on the lichen *Cladonia "rubrotincta"* are *Carabodes areolatus*, *Carabodes labyrinthicus*, *Carabodes marginatus*, and *Mycobates carli*. Adults of these species are frequent inhabitants of lichens and other substrates (mosses, stumps, forest soils, etc.). Other mites found on this lichen were not common lichen inhabitants and were likely present only temporarily. The lichen species *Cladonia norvegica* and the surrounding species *Cladonia coniocraea* contained the same mite species of the genus *Carabodes* as *Cladona "rubrotincta"*.

Based on food preference tests performed with the mites *Carabodes areolatus* and *C. marginatus*, it can be concluded that the rhodocladonic acid does not have a repellent effect on these mites. The species *Carabodes marginatus*, on the contrary, seemed to be attracted to this substance. Furthermore, differences in preference between *Cladonia "rubrotincta"* and *Cladonia norvegica* were observed. *Carabodes areolatus* selected lichen species *Cladonia norvegica*, while *Carabodes marginatus* preferred *Cladonia "rubrotincta"*.