



Limestone weathering and endolithic lichens

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Surface erosion surveying is one of the most important topics to understand the evolution of the actual and relict morphologies. Many Authors measured limestone erosion in different environments, e.g. marine (Stephenson & Kirk, 1998; Cucchi et al., 2006) and inner Karst (Cucchi et al., 1995; Cucchi et al., 1998) or the erosion of different lithologies (Cucchi & Forti, 1988), but there are a lot of unstudied environmental settings. Here we discuss the biodeterioration vs. bioprotective role of endolithic lichens, that are among the most common colonizers of European limestone outcrops (Furlani et al., 2006), an extensive series of field measurements were undertaken along two altitudinal transects, located in the Italian Eastern Alps (Trieste Classical Karst - Mount Canin, and in the Central Apennines - La Maiella Massif), from 0 to 2500 m altitude. 8 survey sites have been set in each transept, each with 8-9 measuring stations, i.e. horizontal, smooth rock surfaces colonized by endolithic lichens, or non-colonized rock surfaces exposed by mechanical break and cutting, and re-exposed horizontally. Lowering rates were measured in situ twice a year in each station using a micro-erosion meter (MEM) or a traversing micro-erosion meter (t-MEM - estimated precision: 1 μm). A sample of the lichens colonizing each measuring station was taken for identification, and thin and polished sections (more than 100) were prepared to describe petrography and the most typical bioweathering phenomena caused by thallus growth. The data of the first year of observations supports the hypothesis that the presence of mature thalli of endolithic lichens reduces rock surface lowering. Throughout the

Maiella transept, in fact, higher dissolution rates were observed in non-lichenised rock surfaces with respect to lichenised surfaces. Similar results were observed also along the Karst-Mount Canin transept. No significant differences were observed along the sites of the same transept. On bare rocks, higher lowering rates have been recorded on micritic limestones than on microcrystalline ones (Cucchi et al., 1995, 1998). The first year data, that must be intended as preliminary, supports the hypothesis that, on colonised surfaces, there are not substantial differences among lithologies. In endolithic lichens, active carbonate dissolution still occurs in the pseudomedulla. However, this contribution seems to be negligible in comparison to the protective effects of the so-called "lithocortex", that forms the external surface exposed to the action of CO₂-containing water, that is particularly aggressive against the bare rock surfaces. The role of other structures, e.g. the fruiting bodies, are also thoroughly discussed.

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