



Environmental impact of Mt. Etna's degassing: volcanogenic trace elements bioaccumulation in two endemic plant species (*Senecio aethnensis* and *Rumex aethnensis*)

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A biomonitoring survey, above tree line level, using two endemic species (*Senecio aethnensis* and *Rumex aethnensis*) was performed on Mt. Etna, in order to evaluate the dispersion and the impact of volcanic atmospheric emissions. Samples of leaves were collected in summer 2008 from 30 sites in the upper part of the volcano (1500-3000 m a.s.l). Acid digestion of samples was carried out with a microwave oven, and 44 elements were analyzed by using plasma spectrometry (ICP-MS and ICP-OES). The highest concentrations of all investigated elements were found in the samples collected closest to the degassing craters, and in the downwind sector, confirming that the eastern flank of Mt. Etna is the most impacted by volcanic emissions. Leaves collected along two radial transects from the active vents on the eastern flank, highlight that the levels of metals decrease one or two orders of magnitude with increasing distance from the source. This variability is higher for volatile elements (As, Bi, Cd, Cs, Pb, Sb, Tl) than for more refractory elements (Al, Ba, Sc, Si, Sr, Th, U). The two different species of plants do not show significant differences in the bioaccumulation of most of the analyzed elements, except for lanthanides, which are systematically enriched in *Rumex* leaves. The high concentrations of many toxic elements in the leaves allow us to consider these plants as highly tolerant species to the volcanic emissions, and suitable for biomonitoring researches in the Mt. Etna area.