A possible endophytic symbiont of *Androsace brevis (Hegetschw.) Cesati (Primulaceae)*

E. Dinatale, M. Bonelli, E. Eustacchio, A. Minici, M. Caccianiga, L. Gianfranceschi

University of Milan

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Androsace brevis is a narrow endemic plant living on windy ridges and peaks in a restricted area of Southern Alps in Lombardy and Switzerland, preferring acid soils with low nitrogen content and flowering immediately after the snowmelt. The species is proposed as a model species to study the effects of climate change on the web of interactions in mountain ecosystems (microbiota and pollinators).

During a preliminary work aimed at developing molecular markers for *A. brevis*, a significant amount of prokaryotic DNA, not compatible with an environmental contamination, was detected. It seems to be a symbiotic relationship. The bacterial genome was *de novo* assembled and identified as belonging to the *Beijerinkiaceae* family, *Rhizobiales* order. Nor the genus neither the species could be identified: nothing similar has been described in the NCBI database so far.

To evaluate the diffusion of the bacterium, specific PCR primers were designed and tested on a large number of *A. brevis* individuals, from eight natural populations. The presence of the bacterium was confirmed in all samples.

Beijerinckiaceae family includes bacteria living in the phyllosphere, often methylotrophs or methanotrophs sharing nitrogen fixation capability (allowing to thrive in habitats where nitrogen sources are scarce, such as *A. brevis* growth-substrate) and capable to promote plant growth. In the present work, we tested different selective growth media to isolate the bacterium. The bioinformatic analysis of the functional domains predicted in the bacterial genome suggested a possible symbiotic relationship with the plant, experimentally supported by preliminary observations confirming the presence of endophytic bacteria inside plant tissues (leaves).

Based on the above, the isolation and identification of this microorganism could help to clarify the very peculiar ecology of this alpine plant and to reduce the current lack of knowledge about high-altitude plant-bacteria interactions.