Ecogeographic Survey of Beta nana - an International Cooperative Effort

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The working group on *Beta* of the European Cooperative Programme for Plant Genetic Resources (ECPGR) recommended that wild relatives of *Beta,* among them*, Beta nana Boiss. et Heldr.,* be included in in situ conservation projects by the respective countries and that international agencies pay a close look at the monitoring of populations under potential threat by genetic erosion (Maggioni et al., 2000). Three years before Maxted et al. (1997) launched the genetic reserve conservation technique. It is a model enabling the biodiversity and agrobiodiversity community the implementaton of the in situ management approach in practice. The AEGRO case study for Beta (L. Frese & M. Pinheiro de Carvalho, AEGRO working document) provides arguments why *B. nana* should be managed in genetic reserves. 1. *Beta nana* is a rare alpine species endemic to Greece with a very limited distribution area. 2. It is a potential source of novel genetic variation for breeding of cultivated beets (*Beta vulgaris* ssp. *vulgaris*). 3. The species cannot be conserved *ex situ* effectively. As it is adapted to very specific environmental conditions there always is the risk of losing genetic variation during seed increase *ex situ.* The *in situ* management of populations in their natural surroundings is the best way of maintaining current levels of genetic diversity of *B. nana*, and the evolutionary processes, which generate new adaptive potential.

Alpine species are more sensitive to extinction risk from climate change (Grabherr *et al.,* 1994). Monitoring and management plans should be established and implemented to detect trends in the population development. If monitoring data indicate a negative trend changes in the management plan can be initiated in time ensuring the viability of the population. A *B. nana* exploration was organized to establish a demographic and genetic baseline, and to identify locations suited for the establishment of genetic reserves. Twenty-six occurrences were found on six mountains during a survey in 2005. Seed of 20 accessions for *ex-situ* conservation and research were collected.

The species was found on six mountains. The size of occurrences ranged from more than 1000 individuals on Mount Olympus in the North to a few individuals on Mount Taygetos in the South. Single sequence repeat (microsatellite or SSR) polymorphisms were used as traits to measure genetic diversity. Preliminary genetic analysis at 4 polymorphic loci revealed 3 distinct clusters. Mount Vardousia and Mount Giona (region A) represent one genetic cluster, while occurrences from Mount Olympus (region B) and Mount Parnassos (region C) each form seperate clusters.

For practical reasons candidate sites for genetic reserves should be located within Natura 2000 areas. A GIS analysis was performed to learn which of the 26 occurrences are growing within or outside protected areas. Recommendations for the planning and establishment of genetic reserves for *B. nana* forming a small network of actively managed, viable populations in the Greek mountains were based on the analysis of geographic and genetic data.