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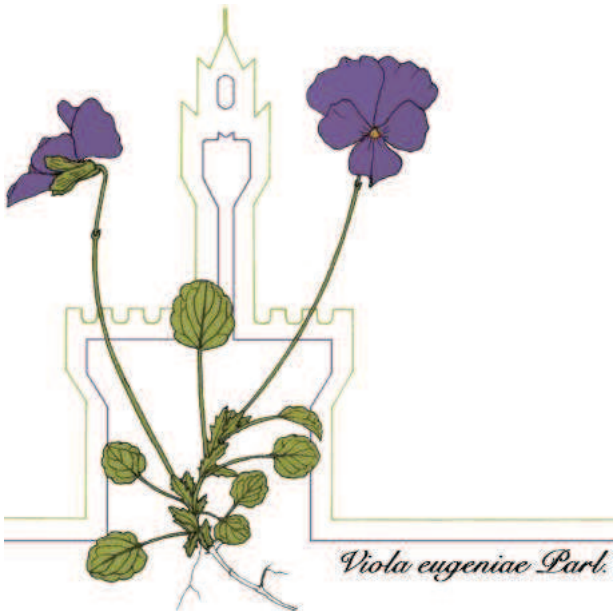

ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS

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Diversity, evolution and nickel accumulation in a critical group of metallophytes from a major serpentine hotspot: the genus *Odontarrhena* (Brassicaceae) in Albania

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Serpentine soils are extreme environments for plant life due to their physical and chemical anomalies, especially the high levels of heavy metals such as Ni, Cr and Co. Only a few plants groups are adapted to live on these soils and these are termed "metallophytes" (1). A special group of metallophytes is that of Ni-accumulator plants, which are able to accumulate more than 1000 μg Ni g^{-1} leaf dry weight without any toxicity symptom. In the Euro-Mediterranean region, the most diverse and widely distributed of these plant groups is *Odontarrhena* C.A.Mey. Several experimental studies on the physiological and molecular mechanisms of Ni-hyperaccumulation have been performed on model taxa of this genus, and many of these are currently used or considered for phytoremediation or phytomining practices (2). Despite the importance of such plants, however, our knowledge about the diversity, evolutionary dynamics and metal accumulation capacity in *Odontarrhena* is still incomplete. Taxonomic interpretation of several species groups remains problematic due to the often large phenotypic plasticity of populations, weak correspondence between morphological, ecological or geographical variation, low phylogenetic divergence and relatively homogeneous karyotype features (3). Past authors proposed complex treatments based on a narrow morphological species concept. More recent views mostly recognize a lower number of taxa, that, however, are considerably different from author to author. Nomenclatural inconsistencies caused by the divergent taxonomic opinions hamper further studies of ecological and physiological type, as well the use of these plants for practical applications.

Because of the large occurrence of serpentine soils and its geomorphological complexity, Albania is a major center of diversity of *Odontharrhena*. The country is botanically still poorly known and, to date, no consensus has existed either about the number and the distribution of native taxa of this genus or about the names to be adopted for them (4). Patterns of genetic variation and diversity within and between such taxa/populations were also mostly unknown, despite a few previous phylogenetic studies (5, 6).

To fill these gaps, we started a series of investigations mainly based on material collected from over thirty natural populations from the entire Albanian territory during numerous field trips started in 2006, on serpentine and non-serpentine soils. After in-depth studies of literature and (scarce) herbarium collections, including type materials, we especially focused on the *loci-classici* of the 18 taxa described from the country. The study of this material with morphological, karyological and molecular tools allowed us to provide answers to the following questions: 1) how many and which taxa do exist in Albania? 2) Which are their phylogenetic relationships and patterns of population genetic structure and diversity? 3) Is there a relationship between the levels of heavy metals (especially Ni) in their native soil and those in their below- and above-ground tissues?

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