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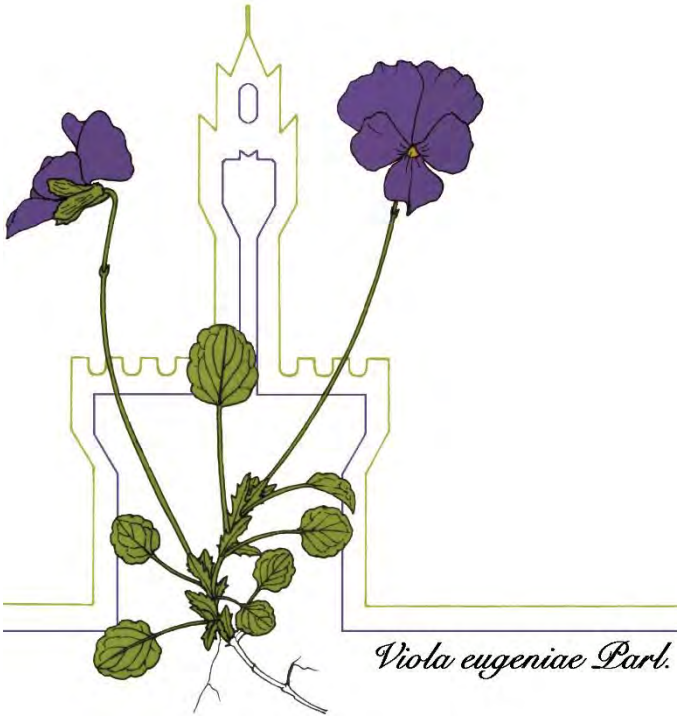

ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS

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10 = Use of drones for environmental monitoring and rare plants conservation status: a new tool for botanical research

Gianmarco Tavilla[1], Alessandro Crisafulli[2], Arthur Lamoliere[3], Veronica Ranno[1], Giulia Bacilliere[1], Salvatore Cambria[1], Pietro Minissale[1], Gianpietro Giusso del Galdo[1], Saverio Sciandrello[1]
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The use of aerial images offer an efficient and cost-effective support for assessing the conservation status and monitoring the distribution range of rare and isolated plant species, as well as Invasive Alien Plants (IAPs). The development of remote sensing is no longer limited to satellite imagery. In the last decade, consumer-grade Unmanned Aerial Vehicles (UAVs) extended the scope and accuracy of vegetation mapping and native plant investigations. UAVs are versatile and cost-effective tools for environmental monitoring. In particular, they allow to evaluate the occurrence of endemic/rare species on inaccessibile growing sites and monitoring plant cover changes over time.
Such new botanical research tool has two main advantages: 1) it allows to have more reliable data on alien and rare/narrow endemic plants, and 2) data sampling does not affect the natural populations or endangers the field researchers. Besides, these concrete actions are useful in implementing any decision involved in the management of a protected area. An accurate census is essential both for habitat management and for monitoring rare/narrow endemic species distribution, as well as to evaluate invasion and invasiveness of alien plants. Nevertheless, site accessibility may represent a significant obstacle, particularly for those species exclusively occurring on fragile and inaccessibile habitats.
Currently, we are carrying out drone field surveys to improve knowledge about rare/narrow endemic species no longer recorded, especially in inaccessibile areas, poorly affected by grazing and human impacts. In addition, we are implementing a database of orthophotos processed from drone aerial surveys both in Sicily and Malta (Figs. 1 and 2). One of the project's target is the identification of the spectral signatures of IAPs. Moreover, this work aims to facilitate the census of rare/narrow endemic plant species with peculiar morphology and the real or potential competition with IAPs.
This research is supported by the FAST Project "Fight Alien Species Transborder" Programme INTERREG V-A Italia-Malta 2014-2020.

Fig. 1. UAV image of rupicolous species at Rocca Salvatesta Cliff, Peloritani Mounts, Sicily

Fig. 2. UAV image of *Carpobrotus* sp. at San Lawrenz Cliff, Dwejra, Gozo