

CHARACTERIZATION OF VOLATILE EMISSION OF ITALIAN POPULATIONS OF ORCHIDS WITH DIFFERENT REPRODUCTIVE STRATEGIES

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The family *Orchidaceae*, with about 24000 species, is the largest in the plant kingdom and the vast majority of orchid *taxa* is well known for its rarity and is threatened in several country throughout the world (1). Orchid flowers are often highly specialized to attract and fit their pollinators, and flower scent together with colour and shape are considered to be the main signal attracting pollinators. Some orchid species provide reward (e.g. nectar or pollen) to the pollinators, but other species are deceptive, so they attract pollinators in different ways, the most common strategies being mimicry of nectariferous flowers (e.g. *Orchis*, *Neotinea*, *Anacamptis*), sexual deception (e.g. *Ophrys*) and provision of shelter (e.g. *Serapias*) (2). In deceptive species attractiveness is very important to ensure reproductive success and, if *Ophrys* species have evolved a high degree of pollinator specificity, *Anacamptis* and *Neotinea* species are more generalist (3).

The aim of this study was to characterize the volatile organic compounds emitted by the flowers of four Italian populations of orchid species, with different attraction strategies, *Ophrys sphegodes* Mill. subsp. *sphogodes*, *Ophrys bertolonii* subsp. *benacensis* (Reisigl) P. Delforge, *Anacamptis morio* (L.) R.M. Bateman, Pridgeon & M.W. Caase, and *Neotinea tridentata* (Scop.) R.M. Bateman, Pridgeon & M.W. Case, using HS/SPME GC-MS. The results showed some distinctive differences in volatile metabolite composition between sexually deceptive and food-deceptive species. In particular hydrocarbons, aldehydes, alcohols and terpenes were the major constituents of both *Ophrys* species bouquet. Other author confirmed that some hydrocarbons, in particular very long-chain alkanes and alkenes and terpenes act as chemical mimicry of the sex pheromone of the virgin female pollinators in sexually deceptive species (4,5).

On the contrary the floral scent of *Anacamptis* and *Neotinea* species were represented by aldehydes, ketones and alcohols following by phenols and terpenes. In these genus colour is generally regarded as a primary cue to attract insects to food-deceptive flowers but it's not confirmed that floral odour is not of importance in pollinator attraction in food-deceptive species (6).

In conclusion HS/SPME GC-MS proved to be a suitable technique for analyzing and distinguishing the volatile fingerprint of different orchid species with different attraction strategies with potentially advantages for ecophysiological studies.

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