Role of pollination systems on the nutraceutical value of the "fruit" of *Fragaria vesca* L.

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Abstract:
Fragraria vesca L. is a cosmopolitan herbaceous species of great agronomic interest for the fleshy (false) fruit it produces that are plenty of phytochemicals belonging to the class of flavonoids, such as anthocyanins, and procyanidins. These compounds are responsible for many nutraceutical properties, acting as antioxidants, anti-inflammatory, and in the prevention of cancer.

In the present study, an experimental trial was set up to evaluate whether the biosynthesis of the above mentioned compounds may be elicited by the plant mating systems. To assess that, 120 plants were grown under controlled conditions in greenhouses in Sanremo, Italy, between August and November 2021. Three experimental groups were made up by manipulating the flowers produced by plants: i) strawberries necessarily autogamous (treated by bagging to avoid the action of wind and pollinators), ii) strawberries necessary allogamous (emasculated and pollinated by a brush with the pollen originating from the flowers of a different plant) and iii) open-air flowers (i.e., able to be pollinated by pollinators insects).

After a hydro-alcoholic extraction, the phytochemical profile of the fruits was assessed both through colorimetric assays (i.e., Folin-Ciocalteu's assay, DPPH assay, and $AlCl_3$) and by means of HRMS in order to investigate variations in their antioxidant activity and overall metabolome in response to differential pollination treatments.

The final aim of the present work is to fill the knowledge gap about the link between pollination ecosystem service and human health, in order to understand to which extent the health of the environment is linked to the quality and functionality of the food on our tables.