

PERILLA, A NEW SPECIES FOR THE ITALIAN HORTICULTURE

botanical characteristics and composition



Perilla frutescens (L.) Britt. (fam. Lamiaceae) is an annual plant native to a wide area between the north-east of India and China. The stem can reach heights of 150-200 cm and has opposite leaves, ovate, green or red, 4-12 cm long and 2.5-10 cm wide, with petioles 2-7 cm long, more or less pubescent, aromatic. The inflorescence is a terminal raceme 6-20 cm long, with white or pink flowers typical of labiate.



It is a short-day species and flowering occurs in the late summer or early autumn.

The fruit is a tetra-achene, with 1-4 achenes (improperly called seeds) 1.5-2 mm long (weight of 1000 seeds 0.8-1 g), ovoid, reticulated, containing 38-45% oil with a slightly pungent flavor. We know many cultivars, different for color, shape and size of the leaves, and for the composition of the essential oil, which determines the aroma, the final use and the potential toxicity of the plant (due to perillaketone). The perilla contains large amounts of phenols and carotenoids, therefore it has great antioxidant capacity. The lutein content of perilla exceeds considerably the amount in spinach, which is considered a major source of this carotenoid for the human diet.



Red-leaf cultivars are particularly rich in anthocyanins.

It is well established that antioxidant compounds are beneficial for human health, as they prevent neoplastic diseases, free radical damages and pathologies associated to ageing or stress. Moreover, the seeds of perilla contain an oil rich in polyunsaturated fatty acid (above all linolenic acid), effective to prevent many important diseases and in the treatment of allergy.

properties

Antimicrobial, antiallergic, anti-inflammatory, antidepressive, antispasmodic, neuroprotective, anti-obesity and even antitumoral according to some researchers.

uses

We can use leaves, young plants, inflorescences and seeds of perilla. It is used as food plant (as leafy vegetable, for the oil extracted from seeds, as spice), but also as cosmetic and medicinal plant. The red-leaf cultivars are also used as food dyes.

activities

Università degli Studi di Milano, in collaboration with Fondazione Minoprio, has carried out some experiments aimed at evaluating the possibility to cultivate the perilla in Italy.

Activities concerned the following aspects:

- propagation of different perilla cultivars in greenhouse and cultivation in soil in open air, or in soilless in greenhouse, into containers filled with organic substrate;
- determination of the composition of different cultivars, especially the content of phenols, anthocyanins, carotenoids, chlorophyll, nitrates, perillaldehyde and perillaketone;
- evaluation of the nutritive requirements of perilla and determination of nitrogen, phosphorus, and potassium uptakes in order to optimize the fertilization;
- evaluation of the attitude of perilla to be used as a ready-to-eat baby leaf vegetable;
- evaluation of the attitude of perilla to control insects and nematodes.

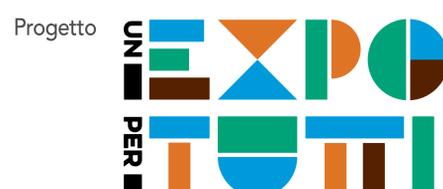
results and conclusions

Perilla shows a good adaptation for the cultivation in the northern areas of Italy.

- The different cultivars showed high contents in antioxidant compounds. In the aromatic fraction some cultivars contain mainly perillaldehyde, whereas others contain perillaketone. This compound has toxic effects in some animals, but its toxicity has never been proven in humans. Nevertheless, for human nutrition cultivars without perillaketone are preferred.
- Perillaketone is very active on the sensing of insects and other invertebrates and it is worthy of consideration in the techniques of pest biological control.
- We observed that some perilla compounds (perillaldehyde and perillaketone) activate the Transient Receptor Potential (TRPs) ion channels, mainly the pungency

receptor responsible for the so called "chemesthetical" or "trigeminal" sensations. This receptor is also activated by other compounds contained in common food plants and spices as mustard, horseradish, garlic, broccoli and other cruciferae, cinnamon and many others, which also have a recognised positive role in the prevention of many diseases.

- Since the cultivars are very different, it is important to evaluate their attitude to various uses.
- We must define the best cultivation techniques, in order to maximize the quanti-qualitative yield and rationalize the agronomical practices also by an economic and environmental point of view.
- Finally, the perilla is interesting for the cultivation in Italy, thanks to the high antioxidant properties, the content in bioactive compounds and the particular aroma.



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