Title:

Saffron (Crocus sativus L.) production in the Italians alps: high quality production from family farm to family table

Abstract:

Saffron is one of the most expensive food spices obtained from the flower stigmas of *Crocus sativus* L., a member of the Iridaceae family. It is an autumn-flowering geophyte plant, that can propagate vegetatively only by means of corms. (Gresta and Ruberto 2008).

For a long time, saffron cultivation was neglected by researchers and farmers since it was considered a minor crop. Only in the last few years has interest increased in using it as an alternative crop for the diversification of agricultural production and as an important new source of income, particularly for multifunctional family farms.

Saffron quality depends on the concentration of its three major metabolites, crocin, picrocrocin and safranal, providing the unique colour, taste and aroma to the stigmas (Lozano and Iborra 2000). According to the ISO 3632 (2010/2011) saffron can be classified into three quality categories (I, II, III) depending on the concentration of crocin, picrocrocin and safranal.

This study represents the first investigation of the quality of saffron produced in the Central Italian Alps evaluated by spectrophotometric analysis. The experiments were conducted on *Crocus sativus* stigmas produced in two consecutive years, 2012-2013 and 2013-2014, in different areas of the Central Italian Alps located at an altitude between 720 and 1200 m a.s.l.. A preliminary assessment of the economic viability of high quality saffron production for local market was also performed.

All saffron samples analyzed fulfilled the ISO specifications for category I regarding moisture and the main spectrophotometric characteristics. The different values found among the sites are normally due to the different environmental conditions and cultivation practices (Zarinkamar and Soleimanpour 2011).

The preliminary economic analysis, performed in Lombardy mountain area, suggests that the cultivation of saffron represents a viable opportunity to diversify agricultural income in multifunctional farms in mountain areas. This opportunity should be seen within a context of reduced generalized public support for agriculture and a focus on specific targets and priorities. Not surprisingly, one of the priorities of the recently approved Rural Development Policy 2014-2020 of the European Union explicitly refers to agricultural diversification development. Particularly in mountain areas farm diversification and a greater integration between agricultural activity and tourism appears to be necessary in order to maintain farm businesses in the future. From that viewpoint a high value added product such as saffron could reasonably be integrated in a mountain farm short supply chain. Indeed, valid information about the high quality of the saffron produced in alpine areas has been provided by the results obtained from spectrophotometric analysis. This high quality saffron production obviously cannot compete in the world market with saffron from low-cost manual labor-intensive countries, but should aim at a potential high quality niche market. The process must be accompanied by traceability and quality marking in order to attract more consumer interest while, on the supply side, a well-considered planning of cultivation management techniques is required in order to contain the significant manual labor costs and to prevent rather frequent production losses.

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