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Poster Abstract – F.09

QUALITATIVE CHARACTERIZATION OF ITALIAN AROMATIC RICE VARIETIES

E. LUPOTTO*, G. MELLERIO**, F. CORANA**, S. CAVIGIOLO*, D. GREPPI*

*) C.R.A. - Istituto Sperimentale per la Cerealicoltura, S.S.11 per Torino km 2,5, 13100 Vercelli - isc.rice@tiscalinet.it
**) Centro Grandi Strumenti, Università degli Studi di Pavia, Via A. Bassi 21, 27100 Pavia.

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Scented rices (*Oryza sativa* L.), characterised by an aroma flavour similar to popcorn, characteristically appreciated in India, Pakistan and the Middle East, are becoming more and more popular in the U.S.A. and Europe. Recent evaluations at the level of European market, have highlighted the dramatic import of scented rices, namely from India and Pakistan. The European import of aromatic rices – namely Basmati – is thought to be increased in such a way due to the new ethnic market and to an increasingly discriminating demand of the consumers. Most rice breeding programmes in U.S.A. and Europe now incorporate sensory evaluations of breeding lines into their evaluation protocols. To date, five white grain aromatic cultivars are present in the Italian rice cultivar collection, and currently cultivated: Apollo, Asia, Gange, Giano and Fragrance. These cultivars have competitive yield performance and quality characteristics, and may compete for the European market with the traditional Basmati imported from Pakistan and India. It is well known that what is called "rice quality" is given by a miscellaneous of parameters including the crude amount of starch, proteins, fibers and lipids, the ratio between the two starch components (amylose/amylopectine) and other minor components. Furthermore, quality is severely affected by the pedoclimatic conditions of the area where rice is grown, the type of processing, and other particular treatments such as *parboiling*. Therefore, the availability of accurate, reproducible and routine analytical techniques allowing a rapid evaluation of paddy rice are of great interest either for product evaluation either as an aid to selection during breeding.

In order to characterize the quality properties of the five Italian aromatic rice varieties, and the variations occurring when the same varieties were grown under different pedoclimatic situations, two analytical methods were used: the RVA (Rapid Visco Analyser – Newport Scientific/Foss) profile, determining gelatinization and paste viscosity characteristics, and the SPME-GC/MS technique for the identification of the volatile compounds profile, and aroma determinants. The five cultivars were grown in three locations, characterised by different soil composition, in a completely randomized design with four replicates. Rice samples were open air-dried in a controlled environment, stored at approx 12% RH, at 4°C. Before RVA analyses, rice was milled, and paste viscosity properties determined using the RVA approved method for rice (Foss RVA rice protocol), with the typical seven parameters. For the volatile compounds profile, the Head Space Microextraction method (SPME), followed by a Gas Chromatography/Mass Spectrometry analysis (GC/MS) was employed. More than 100 volatile compounds contribute to the rice aroma: among them the molecule 2-acetyl-1-pirroline (2-AP) is considered the major component, which is characteristically absent in all non-aromatic varieties. The ratio among the various components reflects the final aroma which is perceived in these rices and give them their specificity. Results obtained confirm the presence of 2-AP in all five Italian aromatic rice varieties, together with a number of other compounds; the RVA profile, analysed together with the crude quantitative analyses of starch, amylose, lipids, and proteins, confirms the influence of the cultural conditions in determining the pasting curve and consequently the general quality of the five varieties,

highlighting that the simple evaluation of each component *per se* is not sufficient to evaluate the complexity of the quality resultant. The present study reports for the first time a detailed quality characterization of the five white grain Italian aromatic rice cultivars.