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PERIODICAL CHANGES OF AMINO ACIDS IN OLIVE CULTIVARS DURING 'OFF' AND 'ON' YEARS

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ABSTRACT

These studies were conducted to see the periodical fluctuations in endogenous levels of three amino acids in three olives cultivars viz. Frantoio, Leccino and Ascolano during their off and on years. An upsurge in the endogenous levels of these three amino acids was found from the month of October, which continued till May. Consequently maximum values of these amino acids were observed in the month of May irrespective of cultivars. Maximum value of asparagine (2.92mg/g), glutamine (2.59mg/g) and tryptophan (0.185mg/g) was observed in cultivar Frantoio during off year whereas, comparatively lower values of these amino acids were observed during on year (2.54mg/g, 2.16mg/g and 0.139mg/g, respectively). Thus comparatively higher levels of these amino acids were observed during the off year than that of on year. The lowest value of amino acids was observed in olive cultivar Ascolano during off and on year, which have shown a shy bearing tendency

Key words : Amino acids, *Olea europaea*, Olive, periodical changes and Seasonal changes.

Alternate bearing is a serious problem in the olive (*Olea europaea*) cultivation, which has attracted the attention of researcher in the country. The physiological maturity of the shoot has been considered to have relation with the flowering behaviour of the crop. Suryanarayana (1978) has emphasized the changes in the contents of nucleic acids, proteins and amino acids in the shoots of 'off' and 'on' year mango in relation to the flowering behavior of this crop. Amino acids act like messengers evoking the process of floral initiation by increasing availability of essential metabolites at the growing apices of fruit trees (Proietti and Tombesi, 1996). But it is not precisely established that whether these amino acids merely act only as messengers activated by various metabolic conditions occurring in the plant system or they act as principal factors of flower induction or their role was only confirmed to successive events leading to floral induction. It is mentioned that asparagine and glutamine only provided a stimulus for floral induction but they do not substitute for insufficient nutrient supply.

Amino acids stored in the woody tissue of fruit trees are of particular importance in the early stages of spring growth since at this time environmental conditions for absorption and translocation of nutrients are not always optimal. This reserve is utilized early in the spring for the development of flowers and leaves. Most studies on nitrogen metabolism in trees report changes of amino acids and soluble proteins in shoots, bark, or leaves, but little is known of the variation in the leaves of these cellular constituents in the buds themselves. The present study attempts to establish the levels and variation of individual amino acids in olive buds (*Olea europaea*) from December to May. The aims were to obtain information on quantitative fluctuations of these constituents.

MATERIALS AND METHODS

The present studies were carried out in the experimental orchards of the Department of Pomology, Dr. Y.S. Parmar University of Horticulture and Forestry, situated at an elevation of 1240 m amsl, during the year 2000-2002. Uniform healthy and disease free bearing trees of three olive cultivars viz. Frantoio, Leccino and Ascolano were selected for undertaking the present studies. The experimental trees were raised on wild olive (*Olea cuspidata*) rootstocks. All experimental trees were kept under uniform cultural practices during the course of investigations.

Uniform healthy shoots of previous season's growth were selected for collecting axillary buds from middle portion of the shoots at monthly interval between October to May of the years 2000-2002. Bud samples were then placed in properly labeled butter paper bags and immediately placed in an icebox and then brought to the laboratory. In the laboratory, bud samples were preserved in 80 per cent methanol and kept in a refrigerator until their processing. Plant material was extracted with 20-25 ml of 70 per cent boiling ethyl alcohol for 10 minutes.