

# Cultivar Identification and Detection of Somaclonal Variations Using RAPD Fingerprinting in Garlic

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## ABSTRACT

RAPD markers were used to assess genetic relationships of three garlic cultivars and to detect somaclonal variations among in vitro regenerated garlic plants. Fifteen arbitrary 10-base primers were successfully used to amplify DNA extracted from in vivo and in vitro plants. Of these, five primers showed characteristic RAPD fingerprinting of the different garlic cultivars can be used to gain rapid and precise information about genetic similarities and dissimilarities of different cultivars. RAPD fingerprints of in vivo and in vitro regenerated garlic plants revealed polymorphisms in 20 % of the analyzed plants.

**Key Words:** *Allium sativa*, DNA fingerprinting, molecular markers, PCR, RAPD, somaclonal variations.

## INTRODUCTION

In addition to plant genetic engineering and tissue cultures techniques, classical breeding is a well-recognized tool for increasing yield, conferring resistances and improving agricultural traits. Both ways involve the presence of simple and precise molecular markers for speeding up breeding programmes and genome analysis. Traditional methods, based on morphological, karyotypic analysis of metaphase chromosomes and isozyme analysis have been used to determine genetic variations in somaclones and to identify parental hybrids and cultivars (Brown *et al.*, 1993). The major disadvantages of such analysis are time consuming-blurred by

environmental analysis-only minor portion of the genome is represented and sometimes it is impossible to analyze high number and small size chromosomes (Rani *et al.*, 1995; Wang *et al.*, 1994).

The development of RAPD (Randomly Amplified Polymorphic DNA) approach (Williams *et al.*, 1990) has allowed simple, easy and less time-consuming genome analysis at the DNA level compared with RFLP (Restriction Fragment Length Polymorphism). Numerous investigators have successfully employed RAPD to find a molecular markers that could be used for genetic analysis of micropropagated and regenerated plants (Taylor *et al.*, 1995); taxonomic studies and classification (Castiglione *et al.*, 1993, Maab