Assessment of Genetic Variability for Yield and Other Characters in Confectionery Sunflower (*Helianthus annuus* L.)

Mysore Shivappa Uma* and Girishraj Urs
AICRP on Sunflower, ZARS, GKVK, Bengaluru- 560065,
Karnataka, India
E-mail: umauas@gmail.com

Abstract

A study was undertaken at the University of Agricultural Sciences, Bangalore, Karnataka, India to assess the genetic variability, correlation, path coefficient analysis, and diversity in confectionery sunflower (*Helianthus annuus* L.) germplasm. The study material consisted of 48 genotypes including 47 confectionery sunflower germplasm lines and a check variety Surya. They were evaluated for ten characters: days to 50% flowering; plant height; head diameter; per cent seed filling; seed yield per plant; 100 seed weight; 100 kernel weight; hull content; oil content; and protein content. The study revealed a wide range of variability and high heritability for all the characters. Phenotypic coefficient of variation was found to be more than genotypic coefficient of variance with respect to all the characters studied. The expected genetic advance as a per cent of the mean was high for plant height, head diameter, seed yield per plant, 100 seed yield, 100 kernel weight, hull content and protein content. Correlation studies revealed that seed yield per plant was positively associated with all other characters, except with hull content and oil content. The maximum direct effect on seed yield per plant at the phenotypic level was accounted by head diameter. D^2 analysis of all ten characters revealed that protein content contributed greatly to genetic divergence. Twenty five sunflower specific SSR primers were used for genetic characterization of the 48 confectionery sunflower germplasms. Of the 25 SSR primers used, 10 primer pairs (ORS331, ORS694, ORS728, ORS785, ORS807, ORS878, ORS 378, ORS1265, ORS1265, and ORS1242) showed polymorphism. A high level of polymorphism

(66.66%) was reported in this studying with the number of alleles in SSR loci ranging from 2 to 4, with an average of 2.5. The present study identified five the promising confectionery sunflower lines, EC 734807, EC 734808, EC 734810, EC734860 and EC 734817 for protein, yield and other desirable confectionery characters. Hence, these genotypes can be selected and advanced for further breeding and can be used as potential donors' in future sunflower hybridization programs.

Key words: sunflower, confectionery, germplasm, SSR markers

食用向日葵产量和其它性状遗传变异评估

Mysore Shivappa Uma* and Girishraj Urs
AICRP on Sunflower, ZARS, GKVK, Bengaluru- 560065,
Karnataka, India
E-mail: umauas@gmail.com

摘要

本研究中，我们在印度卡纳塔克邦班加罗尔农业科技大学对食用向日葵种质的遗传变异、相关性、通径系数和多样性进行了评估。本研究以47个食用向日葵种质自交系，并使用Surya为对照材料。对48个材料的10个性状进行了评估，包括：50%的植株开花的时间、株高、花盘直径、籽粒灌浆百分率、单株籽粒产量、百粒重、籽仁百粒重、壳含量、含油量和蛋白质含量。研究表明，这些性状的变异范围宽且遗传力高。本研究中所有性状的表型变异系数均大于基因型变异系数。株高、花盘直径、单株籽粒产量、百粒重、籽仁百粒重、壳含量及蛋白质含量的预期遗传进度均较高。相关性研究表明，单株籽粒产量与所有性状呈正相关，但壳含量和含油量除外。花盘直径从表型上对单株籽粒产量的影响最大且最直接。对10个性状的D2分析表明，蛋白质含量对遗传分化的贡献最大。使用25个特定的SSR引物评估了48个食用向日葵种质的遗传特性。在25对引物中，10对引物（ORS331，ORS694，ORS728，ORS785，ORS807，ORS878，ORS378，ORS1265，ORS1265，ORS1242）具有多态性。该结果呈现了高水平的多态性（66.66%），SSR位点等位基因的数目在2-4之间变化，平均为2.5。本研究表明，食用向日葵自交系EC734807, EC734808，EC 734810，EC734860 和 EC 734817在蛋白质和产量方面具有理想的食用向日葵性状。因此可以将这些基因型作为潜在的基因供体，在未来的育种和杂交实践中加以应用。

关键词：食用向日葵、种质、SSR标记