



ASSESSMENT OF GENETIC VARIABILITY FOR YIELD AND OTHER CHARACTERS IN CONFECTIONERY SUNFLOWER (*Helianthus annuus* L.)

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INTRODUCTION

- Sunflower (*Helianthus annuus* L.) as a source of vegetable oil and protein is grown in many parts of the world.
- It is grown in all over the world with three main purposes: ornamental, oilseed and confectionery sunflower.
- Growing confectionery sunflower (*Helianthus annuus* L.) for consumption is becoming more and more attractive in the whole world. The prime aims of the confectionery sunflower is to improve the seed yield with greater content of protein in seed, increased mass of 1000 seed, and thin hull being separated easily from the kernel, so that it is very convenient for mechanical nibbling and further processing of the kernel.
- In the present context there is a need to initiate the breeding work on confectionery types of sunflower for identifying high protein content, high yielding varieties to promote export potential of sunflower.
- Present study was carried out to ascertain the genetic variability and diversity among 48 Confectionery sunflower genotypes.

MATERIAL AND METHODS

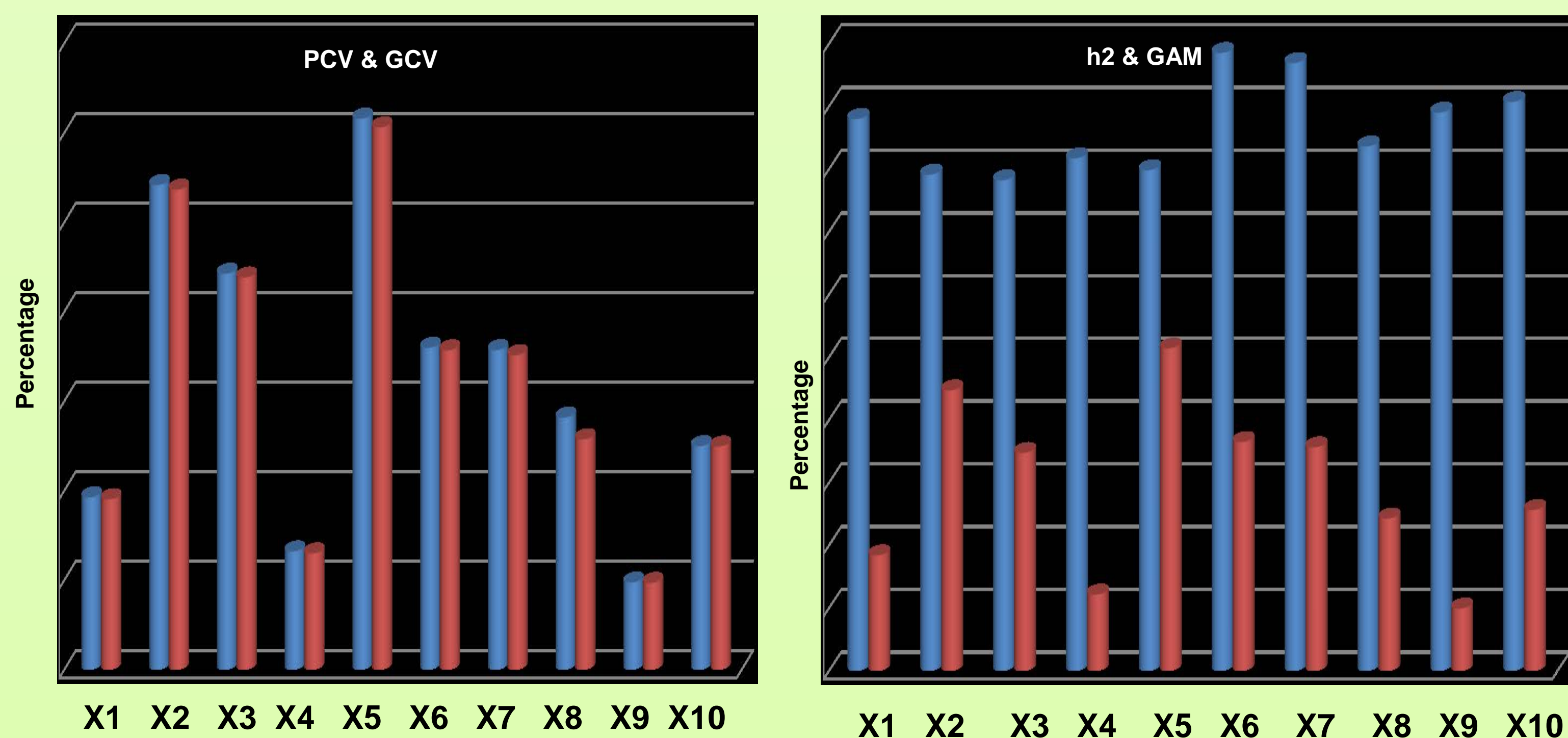
- 48 Confectionery sunflower genotypes were evaluated in simple lattice design with two replication at AICRP, Sunflower, UAS, Bangalore. Spacing adopted was 60 x 30 cm.
- observations were recorded on each entry on five randomly selected plants for yield and yield attributing characters viz., Days to 50 per cent 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.
- Genetic variability and divergence were estimated by Mahalanobis D^2 statistic and the genotypes were grouped into different clusters.
- Twenty five sunflower specific SSR primers were used for genetic characterization of 48 confectionery sunflower Germplasm.

Table 1: Top seven promising confectionery sunflower genotypes with respect to high protein content

Sl. No.	Genotypes	Protein Content (%)	Seed yield per plant (g)	100 seed weight (g)	100 kernel weight (g)
1	EC 734808	30.38	49.99	12.09	8.00
2	EC 734810	30.15	23.93	8.62	5.10
3	EC 734807	27.50	52.82	13.12	8.41
4	EC 734800	26.43	43.51	10.12	6.14
5	EC 734792	25.78	29.24	8.06	5.28
6	EC 734879	25.55	49.28	12.77	6.82
7	EC 734817	24.69	64.59	14.32	8.23



Graph 1. PCV, GCV, h^2 and GAM for yield and other traits in confectionery sunflower Genotypes



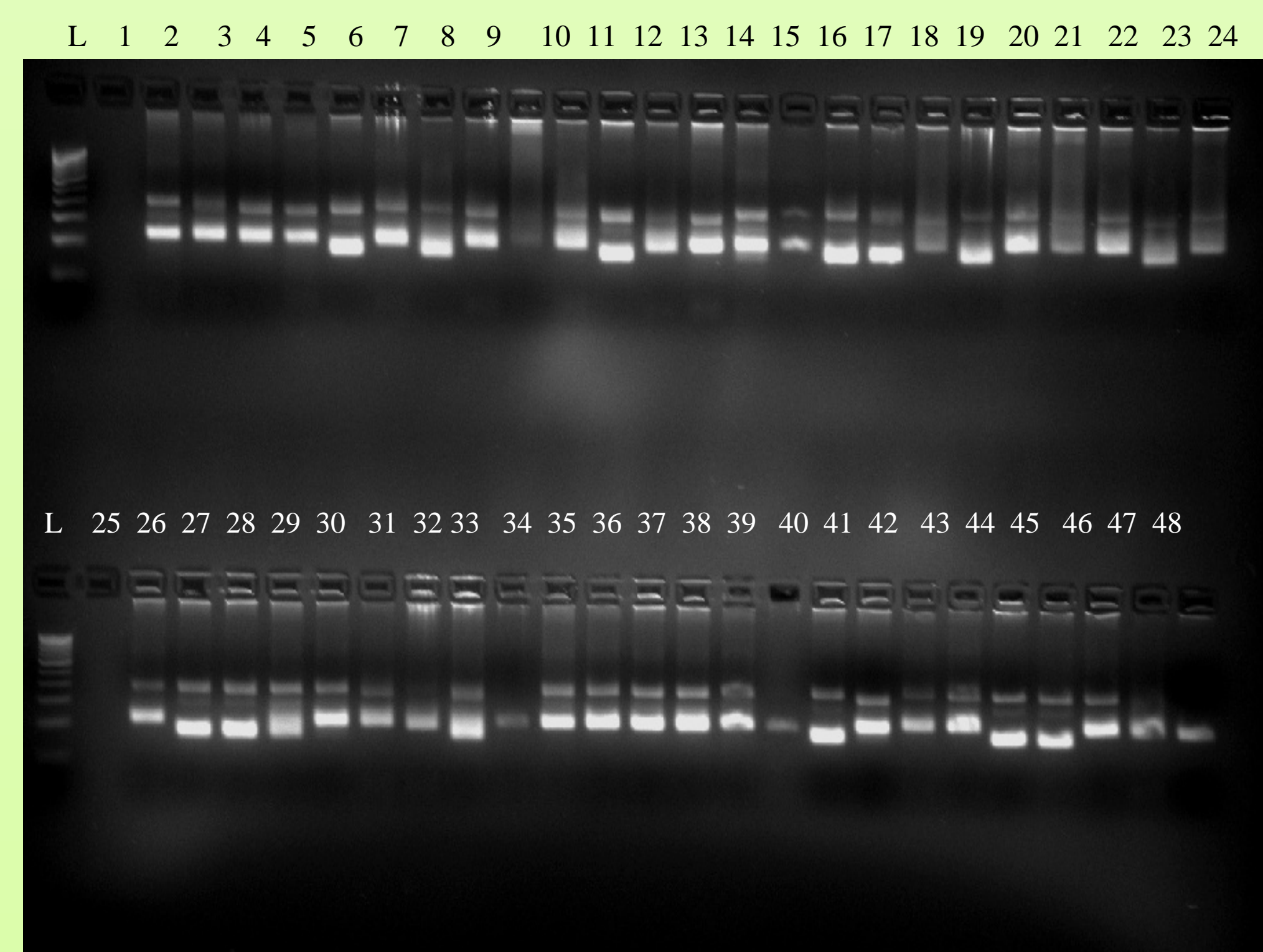
CONCLUSION

- Promising Sunflower lines EC 734807, EC 734808, EC 734810, EC734860 and EC 734817 for protein, yield and having desirable confectionery characters. Hence these genotypes can be selected and advanced through further breeding programme and can be used as potential donors in future hybridization programme.

RESULTS AND DISCUSSION

- The wide range of variability and high heritability for all the characters observed.
- Phenotypic coefficient of variation was more than genotypic coefficient of variance in respect of all the characters studied.
- The expected genetic advance as *per cent* of mean was high for plant height, head diameter, seed yield per plant, 100 seed yield, 100 kernel weight, hull content and protein content.
- 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 phenotypic level was accounted by head diameter.
- D^2 analysis including all ten characters revealed that protein content contributed greatly towards genetic divergence.
- Of the 25 SSR primers used, 10 primers (ORS331, ORS694, ORS728, ORS785, ORS807, ORS878, ORS378, ORS1265, ORS1265, ORS1242) showed polymorphism.
- The high level of polymorphism (66.66%) was reported in this finding and the number of alleles in SSR loci ranged from 2 to 4 with an average of 2.5.

FIG.1: DNA amplified product of ORS 1265 for 48 Confectionery sunflower germplasm lines resolved on Agarose gel



References:

- Kholghi M, Darvishzadeh R, Bernousi I, Pirzad A, Laurentin H. 2012. Assessment of genomic diversity among and within Iranian confectionery sunflower (*Helianthus annuus* L.) populations by using simple sequence repeat markers. Acta. Agric. Scand. Sect. B - Soil Plant Sci. 62: 488-498