

Quantitative estimation of Carthamin and carthamidin from the florets *C. tinctorius* L., (safflower florets)

Abstract

Natural colorants derived from plant materials have gained increasing popularity due to their non-toxic nature. Pigment extraction from the florets is normally done by Soxhlet extraction, maceration, and hydro distillation are conventional methods that have been widely used in industry and laboratory. Phytochemical analysis of safflower florets revealed the presence of high amount of Carthamin and carthamidin..

Key Words: Safflower florets, quantitative analysis, carthamin and Carthamidin.

Introduction

Plants are the rich source of secondary metabolites which play very important role in treatment of different ailments such as cardiovascular diseases, diabetes, meningitis, cancer, hypertension etc.. Safflower flowers are used for the treatment of many illnesses as well as in the preparation of "tonic tea". In India, florets of safflower possess medicinal important properties such as stimulant, sedative and as a promoter of menstrual discharge.

Material and methods

Quantitative analysis and Spectrophotometric Measurements of Carthamin and Carthamidin from petals of Safflower Florets:

Materials:

For the analysis of the pigments ten Genotypes were screened namely they are A1, Bhīma, Jsi-97, CO-1, Manjra, a1, Pbns-12, Nari-6, Nari-28, Sharada, SSF- 658. florets were collected from the field of CPMB, Department of Genetics, Osmania University Hyderabad.

Extraction of carthamin

Dry fine powder (1gr) of safflower florets was suspended in 20ml of methanol, acetone, ethyl acetate and hexane 0.5% WV⁻¹ sodium carbonate. stirred at room temperature for 30mins. after centrifugation at 3500rpm for 15minutes the floating pieces were removed and

the supernatant Was retained at $5\pm 1^{\circ}\text{C}$.this process repeat for one more time.The cooled extracts were mixed together and acidified .Adsorption of carthamin from acid extract was measure at 380nm (described by (Kulkarni et al 1997).

Extraction of carthamidin (safflower yellow):

One gram of fine safflower floral powder was suspended in 20ml distilled water and stirred for 30min. after centrifugation the supernatant was retained at $5\pm 1^{\circ}\text{C}$. The resulting suspension was added to fresh 20ml 0.5% sodium Carbonate and stirred for further 30mint and centrifuged and this process was repeated for one more time .The cooled extracts were mixed together and was basified and measure the .absorption of carthamidin at 450nm (described by (Kulkarni et al 1997).

Thin layer chromatography

Thin-layer chromatographic identification for carthamin and carthamidin based on Rf values which were examined on silica gel G shown in below pictures



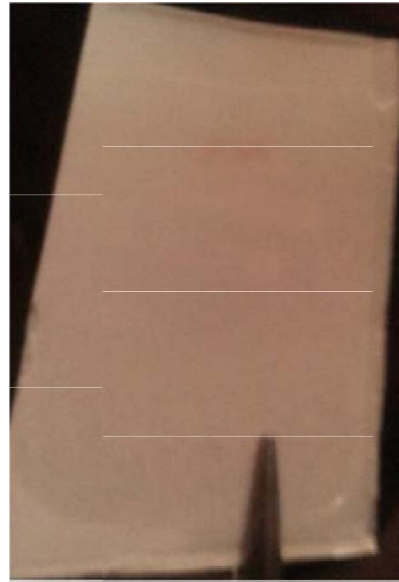
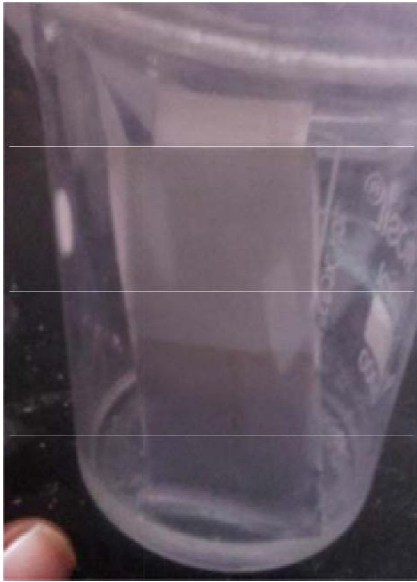


Fig 1: Thin-layer chromatographic identification

Result

Image 1 Field study





Quantification of the yellow and red pigments in the florets of *C.tinctorius* bioactive components from ten different genotypes of safflower (namely they are Manjra, Co-1, Pbns-12, SSf-658, Sharada, Nari-6, Nari-28, A1, JSI-97, Bhīma) has been done by acid and alkali methods by using different polar and non-polar solvent systems such as methanol, ethyl acetate, acetone, hexane and aqueous. After extraction quantification of these bioactive compounds has been done. The result revealed that methanol and aqueous extracts showing more bioactive compounds when compared to others. Among the ten genotypes the maximum quantification is observed in Manjra, Pbns-12, Nari-6, SSf-658, A1, CO-1 when compared to Bhīma, Nari-28, Sharada and Jsi-97. In both methanol and aqueous extracts Manjra shows highest percentage of quantification i.e. 2.350mg/gr followed by Pbns-12 and Nari-6 2.21mg/gr SSf-658-1.921mg/gr A1-1.869mg/gr co-1-1.834mg/gr respectively which is shown in it at figures 2 A -E).

The results are summarized in Figures 2A

Figures 2A Quantitative analysis of Carthamin with ethyl acetate extraction

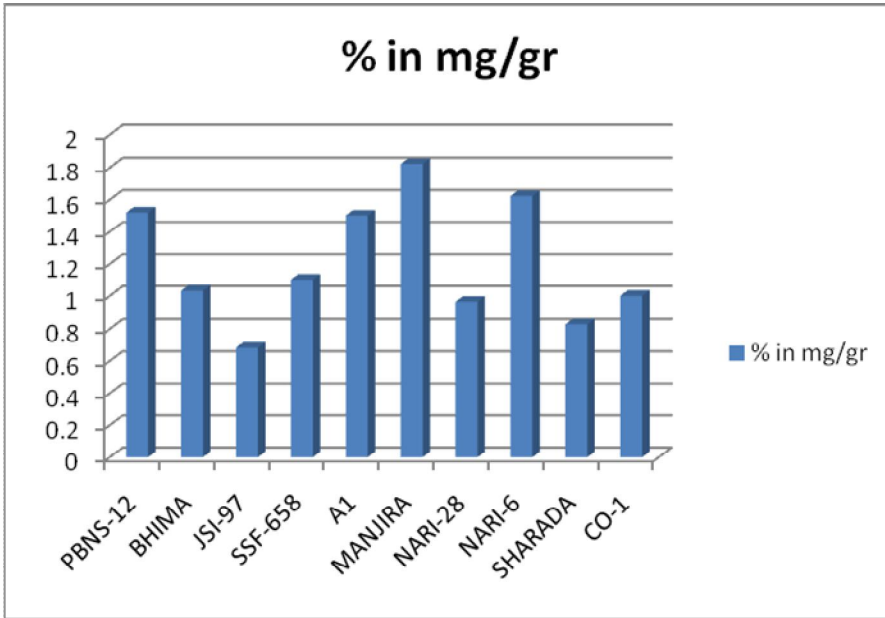


fig: 2B Quantitative analysis of carthamin with methanol extraction

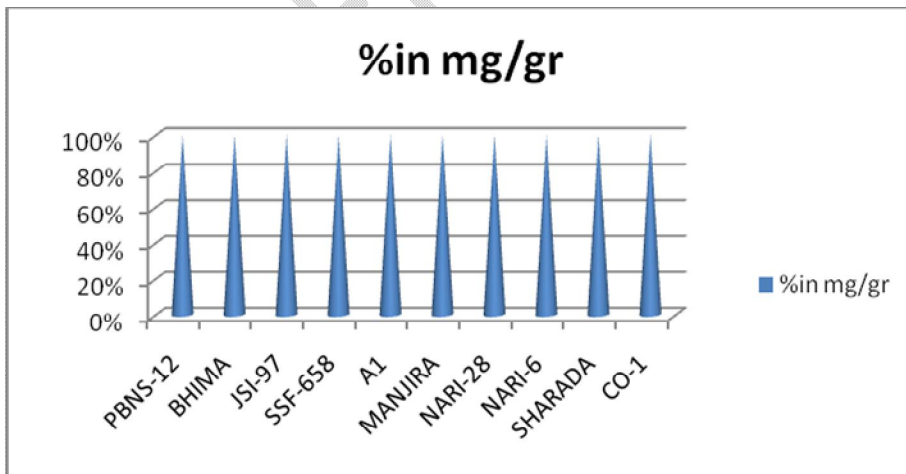


Fig 2C Quantitative analysis of carthamin with hexane extraction

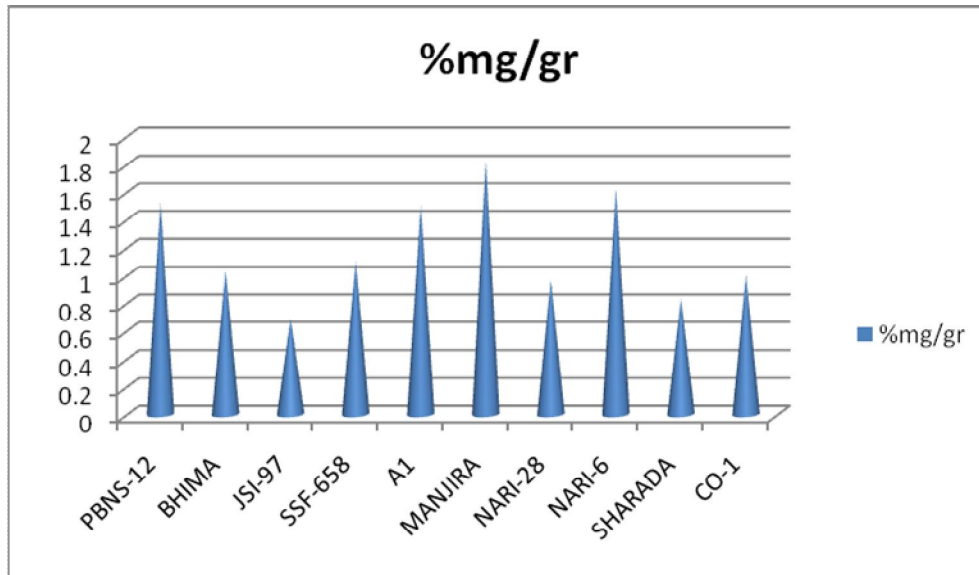


Fig :2D Quantitative analysis of carthamin with acetone extraction

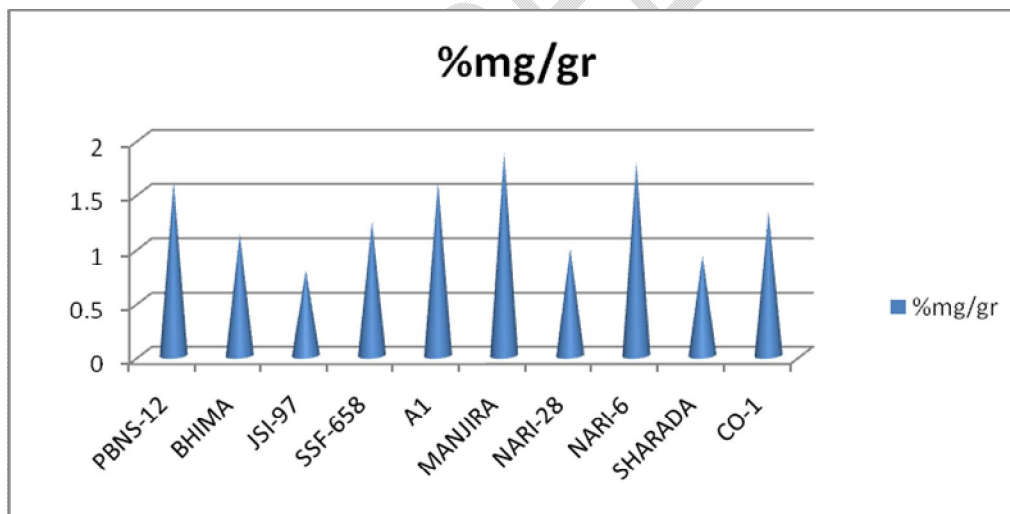


Fig : 2E.Quantitative analysis of carthamidin with aqueous extraction

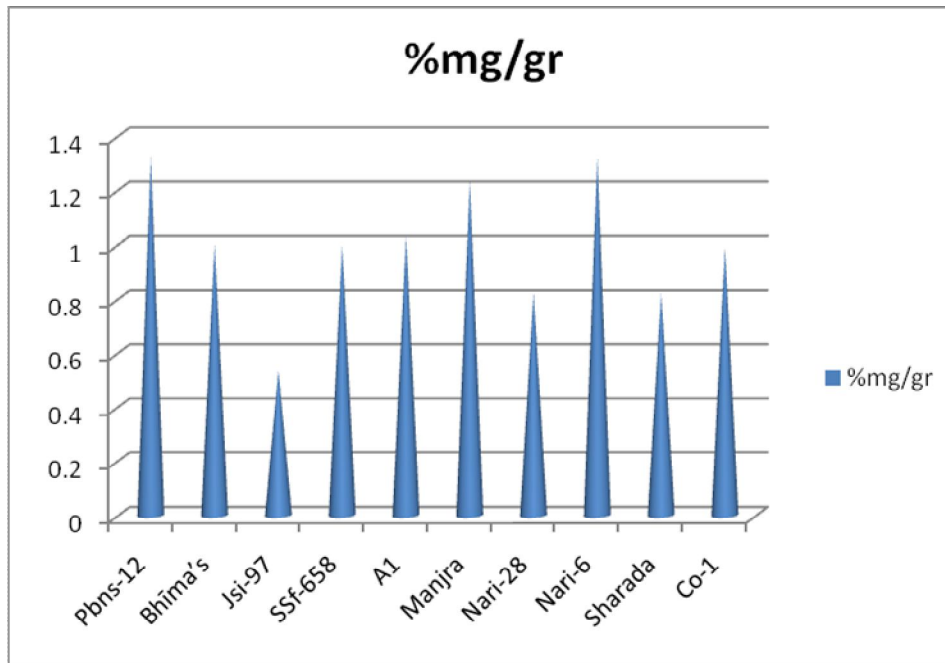




Image 2 : Study analysis and protocol

Discussion

The quantification of Carthamin and carthamidin has been done from the petals of safflower florets by aqueous and methanolic extraction . The yellow and red pigments can be especially utilized in the pharmaceutical as well as food industries due to their non toxic nature when compared to the synthetic dyes used in the food colorants.

Conclusion

Screening of different genotypes of *C.tinctoriusc* for the pigments analysis(safflower florets)clearly reveals that the presence of different two bioactive pigments (phytoconstituents) in petals of safflower floral extracts.. The qualitative and quantitative analyses of these phytoconstituents will be an interesting area for further study in the food as well as in pharmaceutical industries.

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