International Journal of Herbal Medicine
Available online at www.florajournal.com

I J H M International Journal of Herbal Medicine

ISSN 2321-2187
IJHM 2014; 2 (1): 119-120
Received: 01-02-2014
Accepted: 10-03-2014

Baga Ram
Plant tissue culture and Biotech Lab. P.G. Department of Botany, Govt. Dungar College, Bikaner, Rajasthan, India

Navdeep S. Bains
Plant tissue culture and Biotech Lab. P.G. Department of Botany, Govt. Dungar College, Bikaner, Rajasthan, India

Correspondence:
Baga Ram
Plant tissue culture and Biotech Lab. P.G. Department of Botany, Govt. Dungar College, Bikaner, Rajasthan, India

Sterol contents from two plant species of western Rajasthan grown *in vivo* and *in vitro*

Baga Ram, Navdeep S. Bains

ABSTRACT
Investigation of sterol contents from two selected plant species of western Rajasthan i.e. *Glinus lotoides* (Molluginaceae) and *Psoralea odorata* (Fabaceae) was carried out. The roots, shoots, fruits and callus tissues of *G.lotoides* and *P. odorata* were analysed for sterol contents. β-Sitosterol and Stigmasterol were isolated and identified. Maximum sterol contents were observed in shoot of *G. lotoides* (0.27 mg/gdw) whereas minimum in Root of *P. odorata* (0.15 mg/gdw).

Keywords: β-Sitosterol; stigmasterol; sterol; western Rajasthan

1. Introduction
Western Rajasthan shows rich in phytodiversity. This region exhibits a great variety of geological, physiographical, climatic, edaphic and biotic conditions and represents diversity of medicinal plant species, which occur on a wide range of habitat. These plant species are good source of phytochemicals of pharmaceutical interest such as flavonoids, sterols, alkaloids, phenolic compounds, sulphides, isothiocyanates, anthocyanins, terpenoids etc. These are the active principles which act as antioxidants, anticarcinogenic, antimicrobials and immunity stimulants. A number of plant species have been screened by many workers for evaluation of steroidal contents [1-9]. The present investigation describes the isolation and identification of Sterol contents from roots, shoots, fruits and callus tissue of *G. lotoides* and *P. odorata.*

2. Materials and Methods
Fully matured and healthy roots, shoots and fruits of all selected plant species were collected from Sagar village area of Bikaner district. The dried and powdered plant parts of selected plant species were used for extraction of sterols. Each of the dried samples was hydrolyzed with 30% acid (2 gm/20 ml) from 4 hours on a water bath. The hydrolyzed test samples were filtered and washed with distilled water till the filtrate attained pH 7. Test samples so obtained were dried at 60 ^{0}C for 8 hours and soxhlet extracted in benzene (200 ml) for 24 hours separately [10]. Each of the benzene extracts of the various test samples were dried in vacuum and taken up in chloroform for further analysis by thin layer chromatography method [11].

2.1 Tissue culture
Nodal segments of *P. odorata* and *G. lotoides* were surface sterilized with 70% ethanol. These were sterilized for 2-3 min. in 0.1% $Hgcl_2$ solution, rinsed with sterile distilled water under laminar airflow. Nodal segment of all these plants were cut into small pieces and aseptically placed on MS. Medium [12]. Supplemented with 3 mg/l BAP+0.5 mg/l 2, 4-D for *G. lotoides* and 4 mg/l BAP+1 mg/L 2, 4-D for *P. odorata.* All the media used throughout this study were supplemented with 3% sucrose and 7% agar. The pH was adjusted to 5.80 with 1N NaOH or 1N Hcl before autoclaving at 121 ^{0}C and 15-lb psi for 20 min. The plant parts and eight weeks old callus tissue (Maximum growth index) of both plant species were used for estimation of sterol compounds.

3. Results and Discussion
β-Sitosterol and Stigmasterol were isolated and identified. Their quantitative estimation is given in the following Table 1.

Table 1: Sterol contents (mg/gdw) from plant parts of selected plant species.

Plant species	Plant Parts/callus	β-Sitosterol	Stigmasterol	Total contents
1. *Glinus lotoides*	Root	0.16	0.10	0.26
	Shoot	0.10	0.17	0.27
	Fruit	0.25	0.35	0.60
	Callus tissue	0.04	0.06	0.10
2. *Psoralea odorata*	Root	0.06	0.09	0.15
	Shoot	0.08	0.12	0.20
	Fruit	0.09	0.07	0.16
	Callus tissue	0.08	0.05	0.13

gdw = gram dry weight mg = mili gram

The present investigation show (Table 1) that among both samples tested the total sterol content were found to maximum in the fruit of *G. lotoides* (0.60 mg/gdw) whereas minimum in Root of *P. odorata* (0.15 mg/gdw). In the callus tissue the maximum sterol contents observed in *P. odorata* (0.13 mg/gdw) while minimum in *G. lotoides* (0.10 mg/gdw). The maximum β-Sitosterol (0.25 mg/gdw) was founded in fruit of *G. lotoides* while minimum (0.06 mg./gdw). in the Root of *P. odorata*. The maximum amount of stigmasterol (0.35 mg/gdw) in the fruit of *G. lotoides* and minimum (0.07 mg./gdw). in fruit of *P. odorata*. In these plant species presence of β-Sitosterol along with stigmasterol have been reported. These plants have sufficient amount of sterols and could be a good source for pharmaceuticals.

4. Conclusion

Both plant species, under study area are potential source of secondary products. These retain potentialities to synthesize the sterol contents which play active role in metabolism. Due to presence of these secondary products in the studied plant species growing in western Rajasthan can be used in drug and pharmaceutical industries.

5. Acknowledgement

The authors wish to acknowledge the UGC, New Delhi for providing the financial support in the form of RGNF fellowship.

6. References

1. Akhisa T, Kokke W. "Naturally occurring sterols and related compounds in plants". In Patterson, GW, Nes, WD. Physiology and Biochemistry of Sterols. Champaign, IL: American Oil Chemists' Society. 1991, 172-228.
2. Al-Yahya MA. Phytochemical studies of the plants used in traditional medicine of Saudi Arabia. Fitoterapia 1986; 57(3):179-182.
3. Kapoor BBS, Mishra R. Sterol Contents from Some Cappridaceous Medicinal Plants of North-West Rajasthan. International Journal of Medical and Pharmaceutical Science Research and Review, 2013; 1(2):1-6.
4. Sauerwein M, Yoshimatsu K, Shimomura K. Further approaches in the production of secondary metabolites by plant tissue cultures. Plant Tissue Culture Letts. 1992; 9:1-9.
5. Savikin F, Katarina G, Dragoljub C, Ljubinka M, Nobojsa RM. Diosgenin and phytosterols contents in five callus line of *Dioscorea balcanica*. Plant Science (Shannon). 1998; 135(1):63-67.
6. Singh D, Nag TN. Steroidal components of seeds of *Peganum harmala* growing in Rajasthan Comp. physiol Ecol 1981; 6(3):163-164.
7. Valsta LM, Lemstrom A, Ovaskainen ML, Lampi AM, Toiva J, Korhonen T *et al*., Estimation of plant sterol and cholesterol intake in Finland: Quality of new values and their effect on intake. British Journal of Nutrition 2007; 92(4):671-8.
8. Vieno P, Jari T, Riitta P, Anna ML. Plant sterols in vegetables fruit and berries J Sci Food Agric 2003; 83: 330-337.
9. Zirvi KA, But A. Chemical Investigation of Germinated *Peganum harmala* Seeds. Pak J Sci Ind Res 1971, 14.
10. Nag TN, Mathur CS, Goyal SC. Phytochemical studies of *Tribulus alatus, T. terrestris* and *Agave wightii* for Primary and Secondary Products. Comp physiol. Ecol. 1979; 4:157-160.
11. MR. Heble, Narayanaswami S, Chadha MS. Diosgenin and β-Sitosterol: Isolation from *Solanum Xanthocarpum* Tissue Cultures. American Association for the Advancement of Science Stable 1968; 161(13):1145.
12. Murashige T, Skoog F, a revised medium for rapid growth and bio assay with Tobacco Tissue culture. Physiologia planetarium 1962; 15:473-479.