

## FLAVONOID CONTENTS FROM SOME MEDICINAL TREE SPECIES OF SIROHI DISTRICT OF RAJASTHAN

**\*Kapoor B.B.S. and Deepak Kumar**

*Department of Botany, Herbal Research laboratory, Dungar College, Bikaner 334001, India*

*\*Author for Correspondence*

### ABSTRACT

Evaluation of flavonoid contents from three selected medicinal tree species growing in Sirohi district of Rajasthan like *Butea monosperma*, *Cassia fistula* and *Madhuka indica* was carried out. The leaves and fruits of selected trees collected from three different sites i.e. Mount Abu, Pindwara and Shivganj of study area were analysed for flavonoid contents i.e. Quercetin and Kaempferol. Flavonoid contents like Quercetin and Kaempferol were isolated and identified. Among all the plant samples tested the total flavonoid contents were found maximum (6.66 mg/g.d.w.) in the fruits of *Cassia fistula* and minimum (5.42 mg/g.d.w.) in the leaves of *Madhuka indica*.

**Keywords:** *Flavonoid Contents, Medicinal Tree Species, Sirohi District, Rajasthan*

### INTRODUCTION

Sirohi district of Rajasthan is rich in medicinal tree species with a wide range of habitats. These medicinal tree species are good source of phytochemicals of pharmaceutical interest such as flavonoids, sterols, alkaloids, phenolic compounds, sulphides, isothiocyanates, anthocynins, 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 antimicrobial principles like flavonoids (Nag *et al.*, 1988; Singh *et al.*, 1988; Ahmed *et al.*, 1999; Ahmed *et al.*, 2001; Kapoor and Ranga, 2003; Kapoor and Kumar, 2005; Kapoor and Mishra, 2013; Kapoor and Purohit, 2013; Kapoor and Pandita, 2013).

### MATERIALS AND METHODS

Present investigation describes the isolation, identification and quantitative estimation of flavonoid contents from leaves and fruits of three selected medicinal tree species growing in Sirohi district of Rajasthan like *Butea monosperma*, *Cassia fistula* and *Madhuka indica*.

Leaves and fruits of these selected trees were collected from study area. These were washed with tap water to remove dust, wiped off with cotton and separately cut to small pieces. The plant parts were dried at 100°C for 15 minutes to inactivate the enzymes followed at 60°C till the constant weight was achieved in each case. Each of the dried materials was finally powdered and used for estimation of flavonoids.

Dried and powdered leaves of the selected plant species were collected from Bikaner district and separately soxhlet extracted with 80% hot ethanol (Subramanian and Nagarajan, 1969). On a water bath for 24 hrs. Each of the extracts was concentrated and concentrate re-extracted with petroleum ether (Fraction-I), ether (Fraction-II) and ethyl acetate (Fraction-III) in succession. Fraction-III was dried in vacuo and the resultant was hydrolysed with 7% H<sub>2</sub>SO<sub>4</sub> for 2 hrs. The mixture was filtered and the filtrate extracted with ethyl acetate. Concentrated ether and ethyl acetate fraction were applied on TLC

Plates along with standard reference compounds and the plates developed with the solvent system n-butanol, acetic acid and water (4:1:5) when kaempferol and quercetin were detected.

The compounds were isolated by preparative TLC and crystallized, mp (quercetin 309°-311° C and kaempferol 271°- 273° C). IR spectra compared well with their authentic samples. Quantitative estimation of flavonoid contents was carried out by method (Kariyone *et al.*, 1993 and Naghski *et al.*, 1975 for quercetin and Mabry *et al.*, 1970 for kaempferol).

## Research Article

### RESULTS AND DISCUSSION

Quercetin and Kaempferol were isolated and identified. Their quantitative estimation is given in the following Table 1.

**Table 1: Flavonoid Contents (mg/g.d.w.) from Leaves and Fruits of Selected Plant Species**

Plants	Plants parts	Quercetin	Kaempferol	Total Flavonoid Contents
<i>Butea</i>	Leaves	2.16	3.78	5.94
<i>monosperma</i>	Fruits	1.98	3.82	5.80
<i>Cassia</i>	Leaves	1.89	4.36	6.25
<i>fistula</i>	Fruits	2.68	3.98	6.66
<i>Madhuka indica</i>	Leaves	1.75	3.67	5.42
	Fruits	2.18	3.42	5.60

The maximum quercetin (2.68 mg/g.d.w.) was found in the fruits of *Cassia fistula* while minimum (1.75 mg/g.d.w.) in the leaves of *Madhuka indica*.

The maximum amount of kaempferol (4.36 mg/g.d.w.) was found in the leaves of *Cassia fistula* while minimum (3.42 mg/g.d.w.) in the leaves of *Madhuka indica*.

Among all the plant samples tested the total flavonoid contents were found maximum (6.66 mg/g.d.w.) in the fruits of *Cassia fistula* and minimum (5.42 mg/g.d.w.) in the leaves of *Madhuka indica*.

### Conclusion

The medicinal tree species growing in Sirohi district of Rajasthan are potential source of antimicrobial principles. These are resistant to bacterial and fungal attacks due to presence of biologically active substances i.e. flavonoids. These retain potentialities to synthesize the flavonoid contents which are active principles against bacterial as well as fungal pathogens. Due to presence of these secondary products the selected medicinal tree species can be used in drug and pharmaceutical industries.

### ACKNOWLEDGEMENT

The authors wish to acknowledge the UGC, Bhopal for providing the financial assistance for the project.

### REFERENCES

- Ahmed I and Beg Arina Z (2001).** Antimicrobial and Phytochemical studies on 45 Indian medicinal plants against multi-drug resistant human pathogens. *Journal of Ethnopharmacology* **2** 113-123.
- Ahmed-El-Sawi S, Abd-El-Megeed HF and Ali AM (1999).** Flavonoid and antimicrobial volatiles from *Adhatoda vasica* Nees. *Pharmaceuticl and Pharmacological Letters* **9**(2) 52-56.
- Kapoor BBS and Kumar S (2005).** Herbal plants of Rajasthan desert: A potential source of antimicrobial principles. *Journal of Arid Land Studies, Japan* **16** 425-426.
- Kapoor BBS and Mishra Raksha (2013).** Flavonoid Contents from Some Capparidaceous Medicinal Plants of North-west Rajasthan. *Indian Journal of Pharmaceutical and Biological Research* **1**(2) 9– 11.
- Kapoor BBS and Pandita Shelja (2013).** Flavonoid Contents from Some Exotic Tree Species of Rajasthan Desert. *Indian Journal of Pharmaceutical and Biological Research* **1**(3) 20-22.
- Kapoor BBS and Purohit Veena (2013).** Flavonoid Contents from Some Fabaceous Plant Species of Rajasthan Desert. *International Journal of Pharmacy and Biological Sciences* **3**(3) 209-211.
- Kapoor BBS and Ranga P (2003).** Flavonoids from Asteraceous medicinal plants of Rajasthan desert. *Journal of Phytological Research* **16**(1) 101-102.
- Kariyone T, Hashimoto Y and Kinnira M (1993).** Microbial studies on plant components. IX. Distribution of flavanoids in plants by paper chromatography. *Journal of the Pharmaceutical Society of Japan* **73** 253-256.
- Mabry TJ, Markham KR and Thomas MB (1970).** *The Systemic Identification of Flavonoids* (Springer Verlag, Berlin) 119.

**Research Article**

**Nag TN, Mathur CS and Goyal SC (1988).** Phytochemical studies of *Tribulus terrestris* and *Agave wightii*, contents of primary and secondary products. *Comparative Physiology & Ecology* **4** 157-160.

**Naghski J, Fenske (Jr.) CS and Couch IF (1975).** Use of paper chromatography for the estimation of quercetin in rutin. *Journal of American Pharmacists Association* **140** 613.

**Singh V, Sethia M, Mathur K and Nag TN (1988).** Flavonoids of some arid zone plants of Rajasthan. *Indian Journal of Pharmaceutical Sciences* **88** 133.

**Subramanian SS and Nagarajan S (1969).** Flavanoids of the seeds of *Crotalaria retusa* and *C.striata* *Current Science* **38** 65.