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Research Article

COMPARATIVE STUDY OF CARICA PAPAYA LINN. LEAVES WITH SYNTHETIC DRUG DICLOFENAC SODIUM FOR ITS ANTI-INFLAMMATORY ACTIVITY

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Abstract

Carica papaya Linn. ethanolic extract of one and two years leaves was taken, to investigate its Anti-inflammatory activity against synthetic drug Diclofenac sodium. Result showed that the phytochemical constituents Quercetin was present in the leaves of *Carica papaya* Linn. Which is a natural active ingredient for Anti-inflammation, due to antioxidant and inhibitory effect of inflammation producing COX (cyclooxygenase) enzyme, which create inflammation. Identification of Quercetin and synthetic drug was performed by TLC and their % assay was obtained by UV-Vis spectroscopy at 256nm for Quercetin and 285nm for Diclofenac Sodium.

Keywords: *Carica papaya* Linn., ethanolic extracts, TLC, Quercetin, UV-Vis spectroscopy.

Introduction

The papaya tree belongs to a small family- Caricaceae having four genera in the world. The Genus *Carica Linn.* is represented by four species in India of which *Carica Papaya linn.* is the most widely cultivated and best known species.^[1] The different parts of the plant are attributed with different medicinal values. *Ethanolic* extract of *Carica papaya* shows Anti-inflammatory property was demonstrated by *Owoyale et.al.*^[2,3] It has following common names; papaya, paw-paw, pipol etc. The parts that are usually used include leaves, bark, stems, fruits, latex and roots. Plant act as a analgesic, antibacterial, cardi tonic, hypotensive, stomachache. Leaves of papaya tree are good source of alkaloids, flavonoids, enzymes, vitamins etc.^[4,5] Plants often show varieties of biological and pharmacological activities such as *anti-inflammatory*, anti-bacterial and anti-fungal properties. Extracts from its root, seed, stem and fruits of these plants are used in preparation of groups and infusions in the traditional medicines.^[6] *Carica papaya* is a soft plant that has a life span of five-ten years. The fruits, leaves, seeds and stem of *Carica papaya* contain novel biological active compounds, which are efficient as therapeutics or useful in industrial processes.^[7]

Quercetin is a unique bioflavonoid. It plays a major role in the medicinal values of particular plants. But Anti-inflammation property of Quercetin is due to antioxidant and inhibitory effect on inflammation producing enzyme cyclooxygenase. When Quercetin was given through oral route, it was not absorbed in the GI tract at appreciable level.^[8,9] *Diclofenac sodium IP 50mg* is an odorless, yellowish-white crystalline powder, soluble in alcohol. Inhibition of prostaglandin biosynthesis, which plays major role in the cause of inflammation.^[10]

Materials and Methods

Papaya leaves of one (P₁) and two (P₂) year's old plant were collected from the *Vidisha* and *Raisen* district, (M.P) India *Carica papaya linn.* leaves was dried in shade for 3-4 weeks & stored at room temperature. Leaves are grinded to fine powdered and kept in a air tight container for further analysis.'

200gm of the powdered sample of *Carica papaya* Linn. of both the sample (P₁.i.e one year of plant leaves and P₂.i.e two years of plant leaves) was extracted in

Soxhlet apparatus for 48 hrs using ethanol as a solvent.^[11]

Proximate composition of moisture content, total ash, water soluble ash, carbohydrate, calcium and crude fiber of P₁ & P₂ sample of the *Carica papaya* L. leaves was carried out. Table-1.

TABLE-1 Proximate Analysis

S.no.	Name of Test	% Sample P ₁	% Sample P ₂
1.	Moisture content	9%	10%
2.	Total Ash content	2.3%	1.9%
3.	Water soluble Ash	7%	10%
4.	Carbohydrate	9.6%	13.5%
5.	Calcium	1.55%	2.65%
6.	Crude Fiber	2%	1.5%

Phytochemical screening for several constituents i.e Alkaloid, flavonoid, saponin, terpenoid, tannin, cardio-glycosides was performed by using the ethanolic extract.^[12] Table-2

TABLE-2 Phytochemical Analysis

S.no.	Name of Test	Presence in P ₁ sample	Presence in P ₂ sample
1.	Alkaloids	+	+
2.	Flavonoids	+	+
3.	Saponins	+	+
4.	Terpenoids	+	+
5.	Tannins	+	+
6.	Cardio- glycosides	+	+

QUALITATIVE ANALYSIS

Thin layer chromatography and UV-Vis spectroscopy was done; to identify the active component and to determine the assay with suitable methods in both sample of *Carica papaya* Linn. Leaves and in the synthetic drug Diclofenac sodium. Identification of active component *Quercetin* in *Carica papaya* Linn. and diclofenac sodium was done. Standard and extract was applied and there R_f value was compared.

UV-VIS SPECTROSCOPY

Preparation of Std. solution

The Quercetin of Sigma Aldrich chemical co. was taken as standard. Weigh equivalent to 100 mg and

dissolve it in 100ml Ethanol, pipette out 1ml from this and makeup to 25ml. Measure the absorbance at 256nm against Ethanol as a blank.

Preparation of Sample solution

Pipette out 1ml from the filtered of *Carica papaya* Linn. Leaves extract (Sample & Std) was dissolved in 100 ml of Ethanol. From this stock solution pipette out 1 ml and dilute to 25 ml. The strength of the resultant solutions is 0.0025 mg/ml. Measure the absorbance of the standard and extract solution at 256 nm in 1 cm cell against Ethanol as a blank.

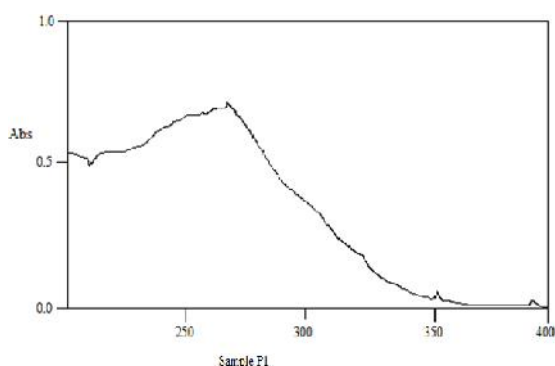
Preparation for Diclofenac sodium Drug

weigh and powdered 20 tablets, Accurately weigh equivalent to 50mg of Diclofenac sodium powder, shake with 60 ml of methanol in a 200ml of volumetric flask and dilute to volume with methanol . Dilute 5 ml of this solution to 100ml with methanol and measure the absorbance of the resulting solution at the maximum at about 285nm.^[13]

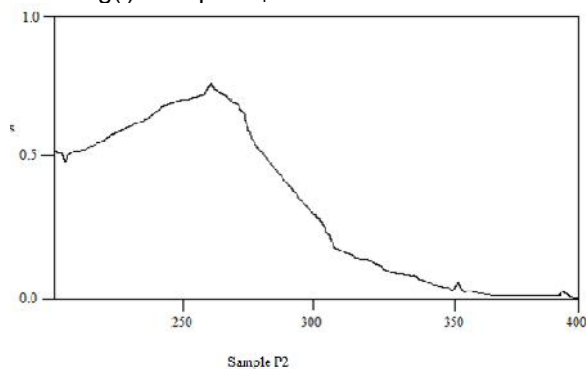
Results and Discussion

Anti-inflammatory constituents *Quercetin* found in the leaves of *Carica papaya Linn.* one & two years old leaves of papaya plant was extracted and isolated by the soxhlet apparatus using ethanol as a solvent; qualitative analysis was done by UV-Vis spectroscopy

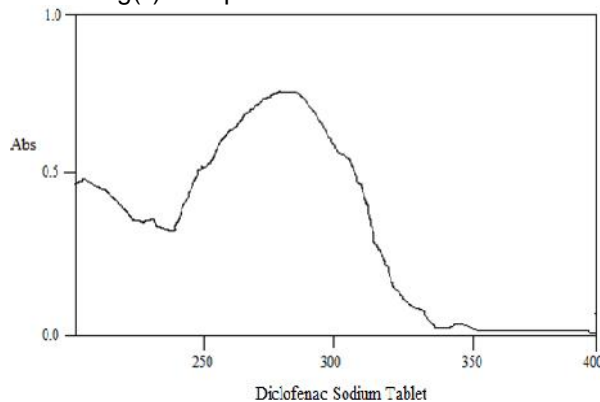
the % assay in P₁ & P₂ sample was found i.e. 90% and 91.6% it is shown in the fig. (i),(ii) respectively which represent that as age of plant increases, active ingredient was also increases. And in the drug sample Diclofenac sodium 100.26% shown in fig. (iii). By TLC chromatographic R_f values was compared with its Standard i.e. R_f value of Std. Quercetin 0.82 whereas in P₁, P₂ sample was 0.80,0.79 shown in the fig.(iv) & (v) And R_f value of Std. Diclofenac sodium is 0.62 while in sample is 0.61 fig.(vi). Physicochemical and phytochemical analysis was also done on the leaves. A parallel comparative study was performed on Anti-inflammatory, analgesic synthetic drug *Diclofenac sodium* on all the parameters according to the *INDIAN PHARMACOPOEIA*.



Fig(i) Sample P₁- 256.3 Abs. 0.738



Fig(ii) Sample P₂- 256.0 Abs. 0.752



Diclofenac Sodium Tablet

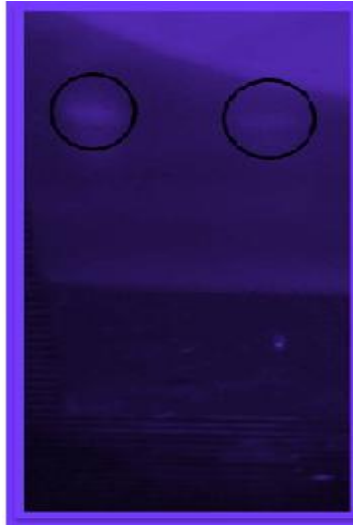


Fig. (iv.) TLC for sample P₁



Fig(v) TLC for sample P₂

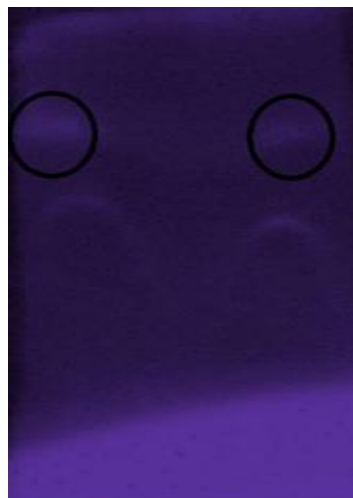


Fig (vi) TLC for Diclofenac sodium

Conclusion

It was concluded that, due to the ageing of leaves the percentage of proximate analysis increases. The continuous intake of synthetic drug Diclofenac sodium shows adverse effect on body. But papaya leaves doesn't shows any kind of harmful effect on its prolonged administration.

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