Journal of Pharmacovigilance & Drugs Safety

An Official Publication of Society of Pharmacovigilance, India.

Original Article

Standardisation & investigation of preliminary phytoconstituents at three stages of fruiting of figs *of Udumbar* (*Fius racemosa* Linn.)

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ABSTRACT

Background: *Udumber (Ficus racemosa Linn.) is a plant seen mostly all over India. It's every part i.e. root, stem, leaves, fruits, ksheer are used in treatment of various diseases Diabetes, Diarrhoea, Cancer by its pharmaceutical & nutritional properties. Though having medicinal property abundant amount of its fruits are wasted. It green fruit is eaten as vegetable in villages & ripened fruits are eaten. Udumber trees are seen in so often Udumber fruiting is in clusters & 2-4 times in year. Feasibility of fruits are good. They can be eaten directly or with honey/sugar/jaggery/ghee. Therefore it will be cheapest, easily available nutrition to children, in pregnant woman, malnourished patients of cancer, diabetes, HIV, Koch's etc as compared to available costly nutritious, pharmaceutical drugs.* ***Materials and Materials and Methods:*** *Samples were collected 5 seasons of its fruiting throughout year from Kharghar –Navi Mumbai & are authenticated. Collection of equal amount of samples each at three stages of figs of Udumber (Ficus racemosa Linn.) i.e Unriped figs (Bright green), Middle stage between Unriped & ripened (Reddish orange), Ripened Figs (Red) from different clusters of same plants randomly. Standardization were done according to Ayurvedic Pharmacopia of India. Study were done in 3 stages i.e Pharmacognostic study, preliminary phytoconstituents study and analysis of collected data by ANOVA method done.* ***Result and Discussion:*** *Ficus racemosa is with ripened fig- LOD-0.11%,ASH-8.05%,AIA-0.746%,ASE-8.896%,WSE,- 28.304%,pH-5.2.Proteins-9.34,Carbohydrates-22.88,Fixed oils : 2.736, Unripened Fig- LOD-0.11%,ASH-9.842%,AIA-1.26%,ASE-9.764%,WSE,-16.264%,pH-5.2. Proteins-9.07%, Carbohydrates-21.64%, Fixed oils: 5.12% Primary metabolites present as Carbohydrates, Proteins & fats. Presence of secondary metabolites like Tannin, Glycosides, Steroids, Caumarins, Flavonoids in all stages of ripened & unripened figs. Alkaloids & saponins are not traceful. Calcium, Phosphorus, Iron, Silica, Potassium etc. are present in all stages.*

Conclusion: *ANOVA test done for statistical evaluation.There are no significant difference in view of Physicochemical & phytoconstituents evaluation at three stages of figs of Udumbar.*

Key words: *ANOVA, Phytoconstituents, Primary & secondary metabolites, Udumber.*

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INTRODUCTION

WHO & UNICEF giving more importance to easily available therapeutic food at home & its surroundings for the treatment .Government of India recently declared 365 days campaign program for cultivation & conservation of medicinal plants & their uses in day to day life.Health of the person is directly concerned with economic development of country (per capita income).

UDUMBAR (*Ficus racemosa* Linn.) is a plant seen mostly all over India. It's every part i.e. root, stem, leaves, fruits, ksheer are used in treatment of various diseases Diabetes, Diarrhoea, Cancer by its pharmaceutical & nutritional properties. Though having medicinal property abundant amount of its fruits are wasted .It green fruit is eaten as vegetable in villages & ripened fruits are eaten. *Udumbar* trees are seen in so often *Udumbar* fruiting is in clusters & 2-4 times in year. Feasibility of fruits are good. They can be eaten directly or with honey/sugar/jaggery/ghee. Therefore it will be cheapest, easily available nutrition to children ,in pregnant woman, malnourished patients of cancer, diabetes, HIV , Koch's ,etc as compared to available costly nutritious, pharmaceutical drugs.

Aim & Objective: To Standardise & to investigate preliminary phytoconstituents of unripened, middle stage & ripened figs of *Udumbar* (*Ficus racemosa*).

METHODS

A) Sample collection & Preparation:

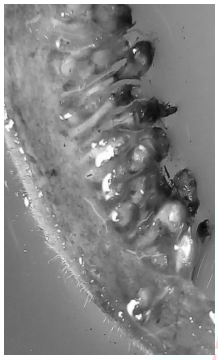
1. Authentification of samples from blatter herbarium done.
2. Collection & preparation of sample:

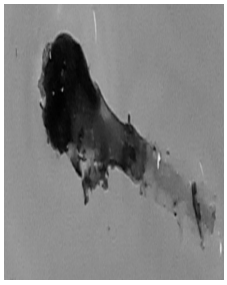
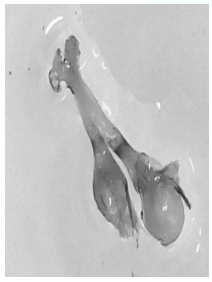
Plant has crops 2-5 times from January-December. At that period figs were be collected as crops A,B,C,D,E in equal amounts from same plants at three stages of fruiting figs of *Udumbar (Ficus racemosa Linn*.) from different clusters of same plants randomly as unripened(green),middle stage(orange),ripened (redish) on the basis of colour of the fruit. Samples were chopped in small pieces, dried in shade, Powder 85mesh were taken as test sample.

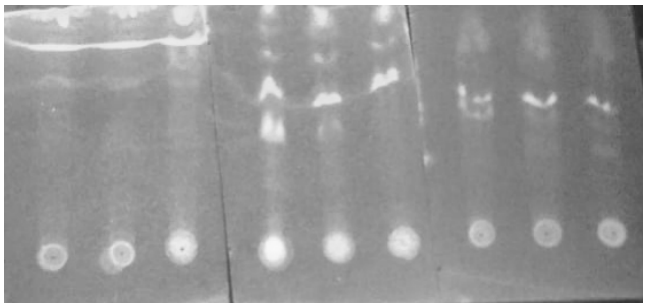
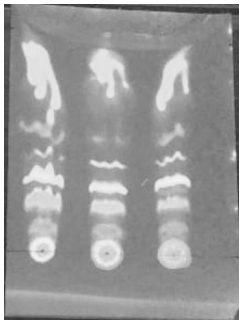
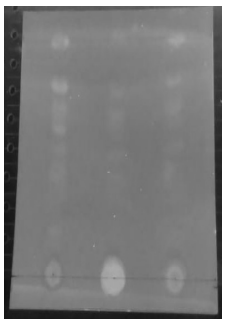
TYPE OF STUDY DESIGN:

1. Pharmacognostic study
2. Chemical composition study
3. Analysis of collected data

RESULTS

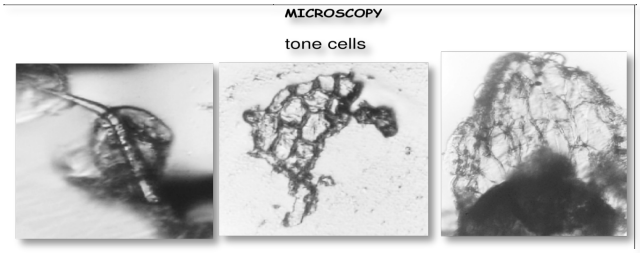


Table 1: Phytochemical Test for Standardization:

		ASH%	AIA%	ASE%	WSE%
Stage 1	Unripened	9.842	1.26	9.764	16.264
Stage 2	Middle Stage	9.084	1.208	8.544	22.04
Stage 3	Ripened	8.054	0.746	8.896	28.304

Table 2: Nutritional factors:

		Carbohydrates	Proteins	Fixed oil
Stage 1	Unripened	21.64	9.07	5.12
Stage 2	Middle Stage	21.904	9.96	4.422
Stage 3	Ripened	22.88	9.344	3.736

Table 3: Phytoconstituents:

	A 1	A 2	A 3	B 1	B 2	B 3	C 1	C 2	C 3	D 1	D 2	D 3	E 1	E 2	E 3
Alkloids	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glycosides (purple)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
reroid (red-brownish)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Caumarins (greenish blue)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Flavonoide (pink)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

		Tannin	Steroids
Stage 1	Unripened	5.468	5.208
Stage 2	Middle Stage	3.772	4.6525
Stage 3	Ripened	3.634	1.98

Table 4: Minerals:

		Ca	K	P	Si	Fe
Stage 1	Unripened	43.2	40.02	5.954	2.804	1.372
Stage 2	Middle Stage	43.52	39.76	5.66	3.174	1.47
Stage 3	Ripened	39.76	43.34	5.872	3.306	1.61

DISCUSSION

Figs of *Udumbar* contains

- Proteins, Carbohydrates, Fixed oils as primary metabolites with +00-++0 calories
- Calcium, Phosphorus, Potassium, Iron, Silica are micronutrients present in figs.
- Phytoconstituents like Sterols-Stigmasterols, Tannin, Glycosides, Flavonoides, Caumarins are present.

Tannin is an astringent, plant polyphenolic compound that binds to and precipitates proteins and various other organic compounds including amino acids and alkaloids. Coumarins have a significant effect on physiological, bacteriostatic and anti-tumor activity. coumarins are also used as additives in food and cosmetic industry, as laser dyes, agrochemical industries and also as optical brightening agents. Ripened figs meeting all parameters mentioned in API.

As unripened & middle stage of figs parameters are not mentioned in API, standardization are procedures carried out according to API. There are difference in Physicochemical, Phytochemical & chromatographicay tests at different stages of figs. WSE, ASE values are more in ripened than unripened. Total ash value more in unripened than ripened. Proteins has no significant different at all stages. Carbohydrates are more in ripened. Fixed oil more in unripened. Ca % more in unripened than ripened. Potassium % more in ripened than unripened. Phosphorus% more in unripened. Silica % more in ripened than unripened. Sulfur, Chloride, Zn, Iron% have not significant different in all stages. Tannins are more in unripened. Glycosides more in ripened Steroids more in unripened. Caumarin are more inunripened. Flavonides more in ripened. Stigmasteroid more in unripened. Statistically there is no significant difference in values of Proteins, Carbohydrates, Fixed oil contents, Aminoacids & minerals at three stages of fruiting of fig of *Udumbar*. There is significant difference in Steroids, Caumarin, Glycosides contents.

Scope for further studies:

1. The different types of sugars maltose, fructose, Galactose can be evaluated.
2. Other sterols & phytoconstituents can be recognise using suitable markers.
3. In view of safety, efficacy & Traditionally & globally acceptance preclinical, clinical studies can be carried out.

Limitations of study:

1. TLC-Mass spectroscopy not done as samples are more, financially not possible.
2. All sterols are not quantify as markers are not available.

	MINIMUM%	SAMPLE MIN.%	MAXIMUM%	SAMPLE MAX.%
ASH	7.36	E3	12.53	C1
AIA	0.34	A3	3.2	E1
ASE	3.59	C3	19.64	E1
WSE	7.31	E1	40.14	E2
PROTEINS	5.7	A2	10.44	D2
CARBOHYDRATES	19.2	A2	28	B2
FIXED OIL	3.1	A3	6.8	A1
TANNIN	1.52	E2	7.69	B1
STIGMASTEROL	NON TRACEBLE	E2	8.27	C1
CALCIUM	35.5	C3	47.8	A1
POTASSIUM	36.1	A1	48.4	D3
PHOSPHORUS	5.05	D2	6.39	B3
SILICA	2.48	C1	3.59	B3
IRON	1.3	A3	2.13	C3

CONCLUSION

Ripened figs of *Udumber* meets API standards. Unripened & middle stage of fruiting of figs standardization done by all classical & pharmacopial methods. This values can referred for further studies. All three stages of fruiting of figs have primary metabolites like Carbohydrates, Proteins, Fats & micronutrients with no much significant difference in values. There is difference in phytoconstituents (tannin, sterols) which indicates more *Mamswardhan* by unripened figs than ripened where nutrition (*kshudhahar, trushahar*) is concerned, there fruits can be used in any stage of fruiting. If neutraceuticals is concerned as per necessary phytoconstituents, unripened or ripened figs can be selected as per pharmaceutical property at different stages in accordance with Ayurvedic literature. WSE needed middle stage of fruiting at end of May & 1st week of June selected. ASE needed unripened stage of fruiting at end of May & 1st week of June will be selected. *Tannin-Kashaya* rasa needed unripened fruits at December end will be selected.

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