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Research Article

IN VIVO FERTILITY ENHANCING ACTIVITY (APHRODISIAC) OF *FICUS CARICA* FRUIT ON MALE WISTAR RATS

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ABSTRACT

Objectives: *Ficus carica* fruit was used traditionally for its fertility enhancing activity by folklore physician.

So, to add to the existing knowledge of pharmaceutical significance of the above plant this work was chosen.

Methods: The dried fruits of *Ficus carica* were extracted by cold maceration method using aqueous ethanol. Ethanolic extract of *Ficus carica* fruit was screened for *in vivo* aphrodisiac activity.

Results and conclusion: Qualitative phytochemical analysis of fruits of *Ficus carica* showed the presence of tannins, flavanoids, saponins, carbohydrates and proteins. Results reveal that on the 1st day of treatment all the treated groups showed increase copulatory sexual behavior and orientational activity in all the experimental animals. The prolonged treatments for all the treated groups were highly effective for increase the sexual libidity, as compared to the solvent control. This indicates that aphrodisiac activity has been shown by ethanolic extract.

Keywords: *Ficus carica* fruit, Aphrodisiac activity, Copulatory sexual behavior, Sperm count

INTRODUCTION

India has one of the oldest, richest and diverse traditions associated with the use of medicinal plants. Medicine is a very ancient part and drugs have been used in days of antiquity as far back as history can take us. In this context, it must be mentioned that the indigenous drugs have great importance both from the professional and economic point of view. Herbal medicines have been used for thousands of years to improve the health and well being of civilization. Even in the areas where modern medicines are available the interest on herbal medicines and the utilization has been increasing rapidly in recent years. In this context it is necessary to adopt regeneration mechanism, which helps ensure that herbal medicines have acceptable quality, safety and efficacy. Herbal therapies had become an integral part of health care science. Their pharmaceutical products used in conventional practice were derived from plants. The higher plants provide secondary metabolites of wider variety, there is a growing interest about the benefit of using crude plant extract containing mixtures rather a single moiety. However there are still many challenges and obstacles to the acceptance of plant extract in modern medicinal concept. In the usage of herbal medicines, the information regarding safety regulations, toxicity and hazard identifications are needed to improve its usage. Successful attempts in this direction have already been made [1].

Literature review reveals that *Ficus carica* have been reported for various pharmacological activities such as antispasmodic and anti platelet activities [2], free Radical Scavenging Activity[3], cytotoxic effects[4], antifungal[5], hypotriglyceridaemic activity[6], anti-angiogenic Activity[7], anti-pyretic[8], anti-inflammatory activity[9], antimicrobial activity[10], immunomodulatory activity[11] and hepatoprotective activity[12].

Traditional knowledge is a very big asset in most of the developed as well as in developing countries. Especially in India there are many indigenous herbs which are traditionally used in the treatment of various diseases. Of the nearly 121 plant products approved in the international market for treating various disorders of the human body , nearly 74 of them has been using the traditional knowledge from folklore as the lead compound . Like wise fertility enhancing activity of the plant *Ficus carica* has existing for quit a long time. So, to add to the existing knowledge of pharmaceutical significance of the above plant this work was chosen.

MATERIALS AND METHODS

Chemicals

Petroleum ether, ethanol, reagents, carboxy methyl cellulose, were purchased from merck specialities Pvt Ltd, Mumbai. Progesterone and Oestrogen injections were purchased from local market of Andhra Pradesh.

Extraction

The fruits (fig-1) of *Ficus carica* were collected and dried for 10 days. After drying the fruits were grind in to fine powder. The powder was macerated in a container using aqueous ethanol for 15 days with occasional shaking. The mark obtained was evaporated to dryness at room temperature. The obtained extracted was used to phytochemical and pharmacological studies.

Fig. 1: Fruits of *Ficus carcia*

Phytochemical investigation of ethanolic extract of *Ficus carica* fruit

Ethanolic extract of *Ficus carica* fruit was tested for the phytoconstituents such as alkaloids, carbohydrates, proteins, steroids, glycosides, saponins, flavanoids, tannins, triterpenoids and fixed oils [13].

In vivo aphrodisiac screening of ethanolic extract of *Ficus carica* fruit

Preparation of male rat

The male Wistar rats weighing between 150-200 gm were trained for the sexual behavior like mounting, intromission etc.., once a day for a period of 10 days in presence of female rats. A male rat was housed individually in a cage along with two female rats (oestrous phase). Then 15 minutes was allowed as the time required for acclimatization, which was then observed for 1 hour. The males were considered as sexually active only if they attempted to mount the female, when it was introduced into the cage. The male rat which did not show any sexual interest during the test period was considered as inactive male. The sexually active male rats were used for Aphrodisiac activity.

Preparation of female rat

Female rats were housed in 2 groups with food and water ad libtium. The female rats were brought to the oestrous phase by treating them with oestradiol (10µg/kgb.wt), subcutaneously 48 hours before the observation. Progesterone (1.5mg/kg b.wt), was administered 5 hours prior to experimentation subcutaneously to make the animal sexually acceptable. The female rats which were in oestrous phase were confirmed by observing their vaginal smear.

The sexually active male rats were grouped separately and divided into 3 groups, each group consisting of 6 animals. All the animals of the divided groups were administered the test or the solvent control doses, daily, orally using oral catheter, in their respective concentrations. The experimental details are given in table-1

Table 1: Grouping and dosing of animals

Group	Treatment	Dose
Group I	Solvent Control	1ml of 0.3% CMC Suspension
Group II	Ethanolic Extract	200mg/kg b.wt in 0.3%CMC
Group III	Ethanolic Extract	400mg/kg b.wt in 0.3% CMC

Sexual behavior was observed in a dim light at day time in specially designed cages having Glasson all sides and measuring 50X30X30 cu.cm. The male experimental rats were transferred to cage and the female rats in oestrous phase were introduced with male s for one hour. The first 15 minutes were considered as acclimatization period. The activities of male mice in each group were recorded individually for 60minutes after 30 minutes of drug administration on 1st day, 7th day, and 14th day treatments. The following parameters such as Mounting, intromission, licking, anogenital sniffing, genital grooming, non-genital grooming were observed [13].

Determination of Sperm count

After 14th day of treatment rats were sacrificed, seminal fluid was collected from epididymis using forced extraction method. Sperm count was determined by Neubaure's ruling chamber method [13]. Sperm count was calculated as per the formula

$$\text{Sperm count per ml} = \frac{\text{Sperm count x 10 X 1000}}{\text{4 X 0.1}}$$

Sperm count was expressed in terms of the number of sperms per ml and results are given in table-2. Microscopic view of sperms of control and treated groups are shown in fig-2, 3 and 4 respectively.

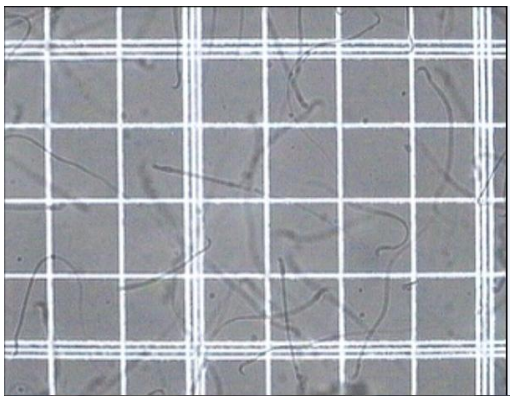

Fig. 2: Sperm count for the control

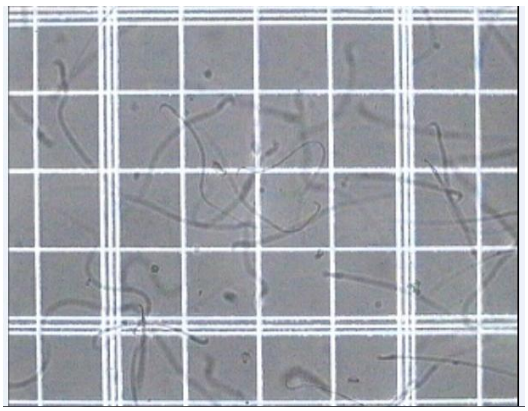

Fig. 3: Sperm count for 200mg/kg.b.wt treated group

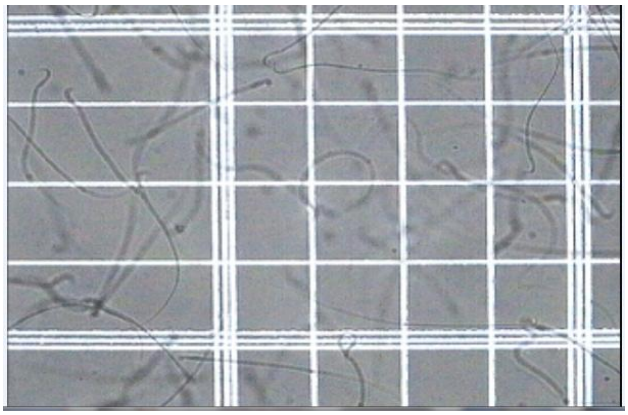

Fig. 4: Sperm count for 400mg/kg.b.wt treated group

RESULTS AND DISCUSSION

The plant selected for the study was fruit of *Ficus carica*. The plant fruit were collected from Andhra Pradesh, India. The dried powdered fruit was extracted with petroleum ether and aqueous ethanol. All the extracts were concentrated to dryness under reduced pressure and controlled temperature. Qualitative phytochemical screening was carried out for the ethanolic extract. Qualitative phytochemical analysis of fruits of *Ficus carica* showed the presence of tannins, flavanoids, saponins, carbohydrates and proteins.

Ethano Botanical information reveals that fruit of *Ficus carica* possess fertility enhancing property in both sexes. Based on this information ethanolic extract of fruit of *Ficus carica* were screened for Aphrodisiac activity. On the 1st day of treatment all the treated groups showed increase copulatory sexual behavior and orientational activity in all the experimental animals as revealed by the result (Table-2). The prolonged treatments for all the treated groups were highly effective for increase the sexual libidity, as compared to the solvent control. This indicates that aphrodisiac activity has been shown by ethanolic extract.

It is likely that the extracts help in improving the testosterone availability to gonads. Increase in testosterone level has been associated with a moderate but significant increase in sexual desire as well. Clinical data on testosterone also suggest that a slightly increased level of testosterone in adult males results in an increased sexual desire and arousability. There is also sufficient evidence that for peripheral responses in nervous system an increased testosterone level is a must which is not the case in case of CNS activity [14]. Therefore, an improved serum testosterone level after administration of extracts could be considered as one of the contributing factors responsible for an overall incremented sexual performance in treated groups. Phytochemical investigation of the plant shows presence of phytoconstituents such as tannins, flavanoids, saponins, carbohydrates, phenols and proteins. So this phytoconstituents may be responsible for activity. Hence the future work is to isolate active phytoconstituents from the extract and also to study mechanism of action the extract.

Table 2: Effect of ethanolic extract of fruits of *Ficuis carcia* on copulatory sexual behavior and oriental behavior.

S. No.	Treatment	Mount Frequency (minutes)			Mount Latency (seconds)			Intromission Frequency (minutes)			Intromission Latency (seconds)			Sperm count (millions/ml)
		1st day	7th day	14th day	1st day	7th day	14th day	1st day	7th day	14th day	1st day	7th day	14th day	
1	Control (0.3% CMC)	4.23± 1.21	560.10 ±3.12	4.62± 1.02	550.00 ±1.26	560.10 ±3.12	556.12 ±0.92	3.12± 0.98	2.96± 0.12	1.98± 1.44	690.12 ±2.16	670.46 ±1.92	680.12 ±3.12	1.042± 0.64
2	Ethanolic extract (200mg/ kg.b.wt)	9.00[b]± 2.00	310.68 [a]±1.26	12.00[a] ±2.00	340.16 [b]±0.98	310.68 [a]±1.26	290.16 [a]±3.12	4.62[a] ±2.12	5.12[a] ±1.29	5.98[a] ±0.88	390.16 [c]±1.98	370.12 [a]±3.42	290.00 [a]±3.12	1.098[a]± 0.28
3	Ethanolic extract (400mg/ kg.b.wt)	11.62[a] ±2.12	216.12 [a]±2.02	18.84[a] ±0.12	240.12 [a]±1.68	216.12 [a]±2.02	200.12 [a]±1.64	4.82[a] ±4.01	5.94[a] ±0.96	7.16[a] ±0.98	250.96 [a]±2.92	240.12 [a]±4.12	210.00 [a]±1.98	1.212[a]± 0.62

Route of administration: Oral , Values are mean±SEM of six animals. Statistical significance: d=ns=p>0.05, c=p<0.05, b=p<0.01, a=p<0.001 as compared to the solvent control group(Bonferroni compare selected pairs of coloumns).

CONCLUSION

In conclusion the ethanolic extract of fruits of *Ficus carica* showed the aphrodisiac activity and it is dose dependent. This work gives scientific evidence to the existing traditional knowledge.

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REFERENCES

1. Tapsell LC, hemphill, cobiac L, et al "Health benefits of herbs and spices; the past, the present, the future". Med.J.Aust.185(4 Suppl);August 2006; S4-24.
2. 2 Gilani AH, Mehmood MH, Janbaz KH, Khan AU, Saeed SA. Ethno pharmacological studies onKhan AU, Saeed SA antispasmodic and antiplatelet activities of *Ficus carica*. J Ethnopharmacol. 2008 Sep 2; 119:1-5
3. Run-ya Y, Yong-fei M, Hui W, Extraction and free radical scavenging activity of total flavonoids from the leaves of *Ficus carica* Linn. Food Science.2010; 16:18.
4. Khodarahmi GA , Ghasemi N, Hassanzadeh F, Safaie M. Cytotoxic effects of different extracts and latex of *Ficus carica* L. on HeLa cell Line, Iranian Journal of Pharmaceutical Research. 2011; 10:273-277.
5. Yan W, Zhao M, Ma Y, Pan Y and Yuan W. Primary purification of two antifungal proteins from leaves of the fig (*Ficus carica* L.) African Journal of Biotechnology. 2011; 10:375-379.
6. Perez C, Canal J, Campillo J, Romero A, Torres M. Hypotriglyceridaemic activity of *Ficus carica* leaves in experimental hypertriglyceridaemic rats, Phytotherapy Research. 1999; 13(3):188–191.
7. Ali Mostafaie A, Mansouri K, Norooznezhad A, Mohammadi-Motlagh H. Anti-Angiogenic Activity of *Ficus carica* Latex Extract on Human Umbilical Vein Endothelial Cells, Cell Journal(Yakhteh). 2011; 12: 525-528.
8. Patil Vikas V, Bhangale S.C., Patil V. R. Evaluation of Anti-pyretic potential of *Ficus carica* Leaves, Int.J.of Pharmaceutical Sciences Review and Research. 2010; 2: 48.
9. Patil V and Patil V. Evaluation of anti-inflammatory activity of *Ficus carica* linn. Indian Journal of Natural product and resources. 2011; 2:151-155.
10. Jeong M, Kim H and Cha J. Antimicrobial Activity of Methanol Extract from *Ficus carica* Leaves Against Oral Bacteria, Journal of Bacteriology and Virology. 2009; 39:97 – 102.
11. Patil V, Bhangale S, Patil V. Studies on immunomodulatory activity of Ficus Carica, Int J Pharm Pharm Sci. 2010; 2:97-99.
12. Gond NY, Khadabadi SS. Hepatoprotective activity of *Ficus carica* leaf extract on rifampicin induced hepatic damage in rats, Indian Journal of Pharmaceutical Sciences. 2008; 70:365-67.
13. 13.Venkatesh P, Hari Prasath K, Prince Francis M, Sankar S, Soumya V. Evaluation of phyto constituents and aphrodisiac activity of the fruits of Durio zibenthinus Linn.,Journal of pharmacy research .2009;2:1493-1495.
14. Bancroft J. The endocrinology of sexual arousal. J Endocrinol. 2005;186:411–427.