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RESEARCH ARTICLE

Evaluation of the Potential Aphrodisiac Activity *of Psoralea corylifolia* in Male Albino Rats

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ABSTRACT

Evaluation of effect of the aqueous, alcohol and chloroform extract of *Psoralea corylifolia* on sexual behaviour of male albino rats. Plant extracts (aqueous, alcohol and chloroform) at doses of 100, 200 and 400 mg/kg were administrated for 21 days. The female rats involved in mating were made receptive by hormonal treatment. The general mating behaviour, libido and potency along with orientation behaviour were studied. The effect of the extract on body weight, reproductive and vital organ weight were determined. The effective chloroform extract were further studied for its effect on hormonal assay and compared with the standard reference drug sildenafil citrate. Similarly adverse effects and acute toxicity of the extract were also evaluated. Oral administration of aqueous, alcohol and chloroform at doses of 100, 200 and 400 mg/kg were significantly increased the Mounting Frequency, Intromission Frequency and Ejaculation latency with reduction in Mounting Latency, Intromission Latency and Post Ejaculatory Interval. It also significantly increased libido as well as Erection, Quick Flips, Long Flips and the aggregate of penile reflexes with penile stimulation. There was significant increase in level of testosterone in the serum. The extract was also observed to be devoid of any adverse effects and acute toxicity. The results of the present study demonstrate that aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed enhance sexual behaviour in male rats. It also thus provides a rationale for the traditional use of *Psoralea corylifolia* as acclaimed aphrodisiac and for the management of male sexual disorders.

Keywords: Aphrodisiac, Herbal medicine, Male sexual behaviour, Male rat, *Psoralea corylifolia,* Seed

1. INTRODUCTION:

An aphrodisiac is defined as an agent (food or drug) that arouses sexual desire. In traditional medicine a variety of plants have been used as sex stimulants[1]. For centuries, Arabs have made use of herbal drugs to improve sexual performance and increase libido [2]. In African traditional medicine, especially in Cameroon, *Zingiber officinale* is used as aphrodisiac and male sexual stimulants [3]. In Egypt, the pollen grain of *Phonix dactylifera* and seeds of *Phonix hermala* are used to restore sexual potency [4]. Male impotence or erectile dysfunction (ED) is a significant problem that may contribute to infertility[5]. There has been a worldwide increase in the incidence of ED, probably due to aging populations and other risk factor such as the presence of chronic illnesses (e.g. heart disease, hypertension and diabetes mellitus), smoking, stress, alcohol, drug abuse and sedentary lifestyles. ED is defined as the consistent inability to achieve an erection sufficient for the purpose of satisfactory sexual intercourse, or the inability to ejaculate, or both[6]. Management therapies include the use of psychotherapy, vacuum devices, surgery, penile implants and drugs [6]. Some of these are too expensive and not easily affordable. Historically pharmacological screening compounds of natural or synthetic origin have been the source of innumerable therapeutic agents [7]. Medicinal plants would be the best source to obtain a variety of drugs [8]. World

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Health Organization estimates that up to 80 percent of people still rely mainly on traditional remedies such as herbs for medicines [9]. *Psoralea corylifolia* (Linn) is a medicinally important plant, belonging to family Fabaceae. The plant is also well recognized in Chinese and Indian folkloric medicine [10]. Survey in the tribal belt of Melghat region (20° 51′ to 21° 46′ N and to 76° 38′ to 77° 33′ E) of Amravati district of Maharashtra state of India revealed that the *Psoralea corylifolia* seeds is being used traditionally as an aphrodisiac. The seeds have been used for over many decades as traditional medicine. The seeds are used in indigenous medicine as laxative, aphrodisiac, anthelmintic, diuretic and diaphoretic in febrile conditions. They have been specially recommended in the treatment of leucoderma, leprosy, psoriasis and inflammatory diseases of the skin and are prescribed both for oral administration and for local external application in the form of a paste or ointment [11].

The present work was undertaken to validate scientifically the aphrodisiac role of *Psoralea corylifolia* seeds as acclaimed by the traditional tribal user of Melghat region of Amravati district, Maharashtra. But to the best of our knowledge, there is no information in the open scientific literature that has substantiated or refuted the aphrodisiac claims of *Psoralea corylifolia* seeds in the folklore medicine.

2. MATERIALS AND METHODS

2.1. Collection of plant Material

The seeds *Psoralea corylifolia* plant was collected from Melghat region of Amravati district during the flowering period of October to January, identified and authenticated by experts from Botanical Survey of India, Pune (Accession No. DD- 2).

2.2. Procurement and Rearing of Experimental Animal

Healthy wistar strain male albino rats of about two month old and weighing 200- 300 g were procured from Sudhakarrao Naik Institute of Pharmacy, Pusad (Maharashtra). The rats were housed in polypropylene cages and maintained under environmentally controlled room provided with a 12:12 h light and dark cycle approximately at 25 °C. They were fed on pellets (Trimurti Lab Feeds, Nagpur) and tap water *ad libitum.* The rats were allowed to acclimatize to laboratory environment for 15 days before experimentation.

All experimental protocols were subjected to the scrutinization and approval of Institutional Animal Ethics Committee [registration number 1060/ac/07/ CPCSEA (IAEC/7/2009)].

2.3. Preparation of Extract

The seeds of *Psoralea corylifolia* were collected, shade dried, powdered and subjected to soxhlet extraction successively with distilled water, ethanol and chloroform. The extract was evaporated to near dryness on a water bath, weighed and kept at 4 °C in refrigerator until further use.

2.4. Phytochemical Screening

The presence of various plant constituents in the plant extract was determined by preliminary phytochemical screening as per Thimmaiah[12].

2.5. Acute Toxicity Study

Healthy male albino rats were starved for 3- 4 h and subjected to acute toxicity studies as per Organization of Economic Co-operation and Development (OECD) guidelines No: 423[13]. They were divided into 4 groups of 6 animals each and kept singly in separate cages during the experiment. Group 1 represented the control group, which received 10 ml/kg of distilled water orally. Groups 2- 4 received suspension of different extract (aqueous, alcohol and chloroform) of *Psoralea corylifolia* seed orally at the doses of 1000, 2000 and 4000 mg/kg daily for 7 days respectively. The rats were observed continuously for 2 h for behavioural, neurological and autonomic profile, and for next 24 and 72 hrs for any lethality or death.

2.6. Mating Behaviour Test

The test was carried out by the methods of Dewsbury and Davis Jr[14] and Szechtman, et al[15], modified by Amin, et al[16]. Healthy and sexually experienced male albino rats (200–300 g) that were showing brisk sexual activity were selected for the study. They were divided into 5 groups of 6 animals each and kept singly in separate cages during the experiment. Group 1 represented the control group, which received 10 ml/kg of distilled water orally. Groups 2–4 received suspension of the different extract (aqueous, alcohol and chloroform) of *Psoralea corylifolia* seed orally at the doses of 100, 200 and 400 mg/kg, respectively, daily for 21 days at 18:00 h. Group 5 served as standard and was given suspension of sildenafil citrate (Vigora tablets, German Remedies) orally at the dose of 5 mg/kg, 1 h prior to the commencement of the experiment. Since the male animals should not be tested in unfamiliar circumstances the animals were brought to the laboratory and exposed to dim light at the stipulated time of testing daily for 6 days before the experiment. The female animals were artificially brought into oestrus (heat) [17] by the Szechtman, et al[15] method (as the female rats allow mating only during the estrus phase) They were administered suspension of ethinyl oestradiol (Lynoral tablets, Organon Pharma) orally at the dose of 100 µg/animal 48 h prior to the pairing plus progesterone (Dubaget tablets, Glenmark Pharma) injected subcutaneously, at the dose of 1 mg/animal 6 h before the experiment. The receptivity of the female animals was confirmed before the test by exposing them to male animals, other than the control, experimental and standard animals. The most receptive females were selected for the study. The experiment was carried out on the 21st day after commencement of the

treatment of the male animals. The experiment was conducted at 20:00 h in the same laboratory and under the light of same intensity. The receptive female animals were introduced into the cages of male animals with 1 female to 1 male ratio. The observation for mating behaviour was immediately commenced and continued for first 2 mating series. The test was terminated if the male failed to evince sexual interest. If the female did not show receptivity she was replaced by another artificially warmed female. The occurrence of events and phases of mating were recorded on audio video-cassette (Sony Handycam) as soon as they appeared. Their disappearance was also recorded. Later, the frequencies and phases were determined from cassette transcriptions: number of mounts before ejaculation or Mounting Frequency (MF), number of intromission before ejaculation or Intromission Frequency (IF), time from the introduction of female into the cage of the male up to the first mount or Mounting Latency (ML), time from the introduction of the female up to the first intromission by the male or Intromission Latency (IL), time from the first intromission of a series up to the ejaculation or Ejaculatory Latency (EL) and time from ejaculation and the first intromission of the following series or Post-ejaculatory interval.

Using the above parameters of sexual behaviour, the following can be thus computed: % index libido= (number mated/ number paired)×100; % Mounted= (number mounted/ number paired)× 100; % Intromitted= (number of rats that intromitted/ number paired)× 100, Intromission ratio= (number of intromission/ number of mount + number of intromission), % Ejaculated= (number of rats that ejaculated/ number paired) × 100; Copulatory Efficiency= (number of intromission/ number of mounts)× 100; Intercopulatory Efficiency= (average time between intromission) [18].

2.7. Test for Libido

The test was carried out by the method of Davidson [19], modified by Amin, et al [16]. Healthy and sexually experienced male albino rats (200– 300 g) that were showing brisk sexual activity were selected for the study. They were divided into 5 groups of 6 animals each and kept singly in separate cages during the experiment. Group 1 represented the control group, which received 10 ml/kg of distilled water orally. Groups 2– 4 received suspension of the different extract (aqueous, alcohol and chloroform) of *Psoralea corylifolia* seed orally at the doses of 100, 200 and 400 mg/kg, respectively, daily for 21 days at 18:00 h. Group 5 served as standard and was given suspension of sildenafil citrate orally at the dose of 5 mg/kg, 1 h prior to the commencement of the experiment. Since the male animals should not be tested in unfamiliar circumstances the animals were brought to the laboratory and exposed to dim light at the stipulated time of testing daily for 6 days before the experiment. The female rats were made receptive by hormonal treatment and all the animals were accustomed to the testing condition as previously mentioned in mating behaviour test. The animals were observed for Mounting Frequency (MF) on the evening of 21th day at 20:00 h. The penis was exposed by retracting the sheath and 5% xylocaine ointment (Lidocaine ointment, AstraZeneca Pharma) was applied 30, 15 and 5 min before starting observations. Each animal was placed individually in a cage and the receptive female rat was placed in the same cage. The number of mountings was noted. The animals were also observed for intromission and ejaculation.

2.8. Test for Potency

The test was carried out by the methods of Hart and Haugen [20] and Hart [21], modified by Tajuddin, et al [22]. Healthy and sexually experienced male albino rats (200–300 g) that were showing brisk sexual activity were selected for the study. They were divided into 5 groups of 6 animals each and kept singly in separate cages during the experiment. Group 1 represented the control group, which received 10 ml/kg of distilled water orally. Groups 2– 4 received suspension of the different extract (aqueous, alcohol and chloroform) of *Psoralea corylifolia* seed orally at the doses of 100, 200 and 400 mg/kg, respectively, daily for 21 days at 18:00 h. Group 5 served as standard and given suspension of sildenafil citrate orally at the dose of 5 mg/kg, 1 h prior to the commencement of the experiment. On the 21st day, the test for penile reflexes was carried out by placing the rat on its back, in a glass cylinder for partial restraint. The preputial sheath was pushed behind the glans by means of thumb and index finger and held in this manner for a period of 15 min. Such stimulation elicits a cluster of genital reflexes. The following components were recorded: Erections (E), Quick Flips (QF) and Long Flips (LF) and Total Penile Reflexes.

2.9. Orientation Activity

The test was carried out by the method of Sharma [23], modified by Islam, et al [1]. Healthy and sexually experienced male albino rats (200– 300 g) that were showing brisk sexual activity were selected for the study. They were divided into 5 groups of 6 animals each and kept singly in separate cages during the experiment. Group 1 represented the control group, which received 10 ml/kg of distilled water orally. Groups 2– 4 received suspension of the different extract (aqueous, alcohol and chloroform) of *Psoralea corylifolia* seed orally at the doses of 100, 200 and 400 mg/kg, respectively, daily for 21 days at 18:00 h. Group 5 served as standard and given suspension of sildenafil citrate orally at the dose of 5 mg/kg, 1 h prior to the commencement of the experiment.

The analysis of orientation activity was carried out and analyzed in three segments with little modification[1].

Orientation behaviour of male rats was determined using following method of scoring:

Orientation towards female – (1 for every sniffing and 2 for every licking)

Orientation towards self – (1 for every non-genital grooming and 2 for every genital grooming)

Orientation towards environment – (1 for every exploration, 2 for every rearing and 3 for every climbing)

The cumulative score for each activity in the half hour was calculated after 21 days of the treatment.

2.10. Effect on Sexual and Vital Organ Weight

After the mating behaviour analysis, the next morning (Day 22), all the control, standard and experimental groups of male rats were evaluated for their body weight. The animals were completely anaesthetized with anesthetic ether (Narsons Pharma), then sacrificed by cervical decapacitation and testis, seminal vesicles, epididymis, vas-deference, penis and prostate glands along with vital organ like liver, kidney, adrenal gland, and spleen were carefully removed and weighed using 4-digital electronic balance (Mettler: Toledo AB 204- S). The relative organ weight of each organ were determined (Relative organ weight= absolute organ weight/ body weight at sacrifice× 100) [24- 26].

2.11. Statistical Methods

All the data are expressed as mean ± S.E. Statistical analysis was done by Student's t-test and one way ANOVA [27].

3.0. RESULTS

3.1. Phytochemical Screening

Preliminary phytochemical screening of the seed extract of *Psoralea corylifolia* revealed the presence of alkaloids, flavonoids, steroids, phenolics, tannins and saponines whereas anthraquinone were not detected.

3.2 Acute Toxicity Study

Clinical toxicity symptoms such as respiratory distress, salivation, weight loss and change in appearance of hair as well as maternal mortality were not observed at any period of the experiment. Similarly no mortality and changes in the behavioural, neurological and autonomic profile were observed in treated groups of the rats up to highest dose of 4000 mg/kg body weight. Hence one tenth of treated dose was selected for present investigation.

3.3. Effect of the Extract on Mating Behaviour

The administration of *Psoralea corylifolia* aqueous, chloroform and alcohol seed extract for 21 days to male rats resulted in remarkable increase in the sexual vigor of the male rats, as evidenced by the different parameters studied. The results of mating behaviour test show that the seed extract of *Psoralea corylifolia* (aqueous, alcohol and chloroform) at the dose of 100, 200 and 400 mg/kg body weight significantly increased the Mounting Frequency (MF) ($P<0.001$), Intromission Frequency (IF) ($P<0.001$) and Ejaculatory Latency (EL) ($P<0.001$). Similarly it also causes significant reduction in the Mounting Latency (ML) ($P<0.001$), Intromission Latency (IL) ($P<0.001$) and Post- ejaculatory interval (PEI) ($P<0.001$) in experimental animal as compared to control group. Similarly, the standard drug also increased the MF, IF and EL as well as decreased the ML ($P<0.001$), IL ($P<0.001$), and PEI ($P<0.001$) in a highly significant manner as compared to control animals. The most appreciable effect was observed in chloroform extract at the dose of 100, 200 and 400 mg/kg body weight of *Psoralea corylifolia* (Table 1).

All the extract (aqueous, alcohol and chloroform) at 100, 200 and 400 mg/kg body weight produced contrasting effects on the EL and PEI of the male rats. Whereas the EL increased following single dose of above mentioned extract at 100, 200 and 400 mg/kg body weight, the PEI decreased in a dose related manner. The alteration in these parameters was statistically significant.

The computed male sexual behaviour parameters which include percentage of index libido, mounted, intromitted, ejaculated and copulatory efficiency were higher in the extract treated animals compared to the distilled water control animals (Table 2). In contrast, the aqueous, alcohol and chloroform seed extract of *Psoralea corylifolia* reduced the intercopulatory interval of the animals in dose related manner compared to the distilled water administered control animals. The decrease observed was statistically significant ($P < 0.001$, $P < 0.01$ and $P < 0.05$, respectively).

3.4. Effect of the Extract on Libido

The results obtained in the test for libido shows that the aqueous, alcohol and chloroform seed extract of *Psoralea corylifolia* at the dose of 100, 200 and 400 mg/kg, significantly increased the Mounting Frequency (MF) ($P < 0.001$, $P < 0.01$ and $P < 0.05$, respectively) as compared to control group. The standard drug also significantly increased the MF ($P < 0.001$) as compared to control animals. Intromission was observed in control, alcoholic, chloroform extract treated and standard groups of animals, but it was absent in aqueous extract treated group. The intromission frequency increases in a significant manner, however ejaculation was noted only in standard group and chloroform seed extract treated group at the dose of 100, 200 and 400 mg/kg body weight. However a strikingly increased libido activity was observed in standard drug and chloroform extract treated group (Table 3).

3.5. Effect of the Extract on Potency

The test for potency revealed that the aqueous, alcohol and chloroform seed extract of *Psoralea corylifolia* at the

dose of 100, 200 and 400 mg/kg, significantly increased the frequency of erection (E) ($P < 0.001$, $P < 0.01$), Quick Flips (QF) ($P < 0.001$, $P < 0.01$) and Long Flips ($P < 0.001$) as well as the aggregate of these penile reflexes (TPR) ($P < 0.001$, $P < 0.01$ and $P < 0.05$, respectively) as compared to control group. The standard drug also showed highly significant increase in the E ($P < 0.001$), QF ($P < 0.001$), LF ($P < 0.001$) and TPR ($P < 0.001$) with respect to control group (Table 4). The chloroform extract of *Psoralea corylifolia* seed at the dose level of 100, 200 and 400 mg/kg body weight significantly increased the frequency of Erections, Quick Flips, Long Flips as well as the aggregate of these penile reflexes as compared to other extract treated group.

3.6. Effect of the Extract on Orientation Behaviour

The aqueous, alcohol and chloroform of extracts *Psoralea corylifolia* seed at the dose level of 100, 200 and 400 mg/kg body weight markedly influenced the orientation behaviour of the treated animals, which showed more attraction towards female rats. The studies on the licking and anogenital smelling revealed that significant increase in number of licking ($P< 0.001$, $P< 0.01$) and moderate increase in anogenital smelling ($P < 0.001$, $P < 0.01$ and $P < 0.05$, respectively) of treated male rats towards receptive female was observed in animal treated with aqueous, alcohol and chloroform seed extract of *Psoralea corylifolia* at various doses. The behavioural assessment of rats towards environment (exploration, raring and climbing) was significantly decreased in experimental animals and moderately in standard group. The studies on the genital grooming revealed that there was highly significant increase in genital grooming ($P < 0.001$, $P < 0.01$ and $P < 0.05$, respectively) in alcoholic and chloroform treated groups, while moderate decrease in nongenital grooming was observed as compared with control group. The standard drug also shows significant increase in genital and non-genital grooming as compared to control group (Table 5).

3.7. Effect of Extract on Sexual and Vital Organ Weight

The intragastric (i. g.) administration of aqueous, alcohol and chloroform seed extract of *Psoralea corylifolia* at the dose of 100, 200 and 400 mg/kg, significantly caused an increase in body weight, when initial and final weight body weight were compared with control. The relative weight of the reproductive organ like testes, caput segment of the epididymis, ventral prostate, seminal vesicle, penis and vas- deferens ($P < 0.001$, $P < 0.01$ and $P < 0.05$, respectively) increased significantly. Similarly, there was significant increase in the relative weight of the vital organs like liver, adrenal gland and spleen ($P < 0.001$, $P < 0.01$ and $P < 0.05$, respectively), when compared with control animal group (Table 6). The significant increase in the weight of reproductive and vital organs was also observed in standard group as compared to control.

4. DISCUSSION

The seed of *Psoralea corylifolia* has been in use by the tribals of Melghat region as a means of treating sexual inadequacy and stimulating sexual vigor even without recourse to the scientific validity of the claim. Hence this study was carried out to validate scientifically this tribal claim.

The phytochemical screening can help to reveal the chemical constituent of the plant extract and the one that predominates over the other. It may also be used to search for bioactive agents as starting products used in the partial synthesis of some useful drugs[28]. The preliminary phytochemical screening of the seed extract of *Psoralea corylifolia* revealed the presence of alkaloids, flavonoids, steroids, phenolics, tannins. It has been reported that steroids and saponin constituents found in the many plants possess fertility potentiating properties, and useful in the treatment of impotence [29]. Saponins found primarily in the leaf *Tribulis terrestris* L. have been used as an aphrodisiac agent in both; the India and Chinese traditional system of medicine [30]. The saponins may therefore boost the level of testosterone in the body as well as trigger libido enhancing effect observed in this study [31]. The presence of flavonoids in the *Psoralea corylifolia* extract which has been implicated to have a role in altering androgen levels may also be responsible for the enhanced male sexual behaviour in this study [32]. The alkaloids can also cause facilitation of sexual behaviour and has effect on sexual behaviour [33]. The improvement in sexual function demonstrated in the current study might thus due to the presence of such compounds in *Psoralea corylifolia* seed extracts. Further study are required to identify the active constitutes responsible for the sexual function improvement activities and the mechanism whereby these activities implanted are in progress.

In the present study, clinical toxicity symptoms such as respiratory distress, salivation, weight loss and change in appearance of hair as well as maternal mortality were not observed at any period of the experiment. This suggested that short term use for this purpose is apparently safe. Similar finding was also observed by Tajuddin, et al [22], while working on ethanolic extract of *Myristica fragrans.*

In male rats latency for mount and intromission are considered as indicators of the sexual motivation, whereas intromission and ejaculation are considered as behavioural indication of sexual performance and facilitation [34]. After treatment with the various experimental doses of seed extract of *Psoralea corylifolia* there was a significant decrease in the latency for mount and intromission indicating an enhancing of sexual motivation, which was predominant at 21st day of

observation. Also an increase in the number of ejaculation with an increase in the ejaculation latency indicated an increase in the sexual performance. The aqueous, alcohol and chloroform extracts have a pronounced effect on sexual behaviour shown by significant increase in Mounting frequency (MF), Intromission frequency (IF) as compared to control. The MF and IF are considered the indices of both libido and potency. The significant increase in Ejaculation latency (EL) suggests that the all experimental extracts and standard drug prolonged the duration of coitus, which is an indicator of increase in sexual motivation [35]. The significant increase in computed male sexual behaviour parameters like % mounted , % intromitted, % ejaculated and the reduction in intercopulatory efficiency are indications of sustained increase in sexual activity and aphrodisiac property inherent in the plant extract [18]. The present finding shows that the aqueous, alcohol and chloroform seed extract of *Psoralea corylifolia* produces a striking enhancement of over- all sexual performance of normal animals. Our finding also corroborates with the aphrodisiac effect of *Allium tuberosum* seeds extract, investigated in male rats at 500 mg/kg for 21 days, which significantly reduced ML, IL and PEI with increased MF, IF and EL [36].

Mounting frequency after penile anesthetization of rats is a reliable index of 'pure' libido and the penile reflexes of the rats are a good model of pure potency [19]. Therefore, in the present study all the extracts (aqueous, alcohol and chloroform) were also studied for effect on these components of sexual behaviour. The effect of the of aqueous, alcohol and chloroform seed extract of *Psoralea corylifolia* at the dose of 100, 200 and 400 mg/kg on libido was studied by assessing the MF after genital anaesthetization which does away with the reinforcing effect of genital sensation thus affording the study of pure libido or intrinsic sexual desire. During the experiment the test extracts produced a significant increase in the MF of sexually normal male rats and in standard drug. Whereas, the MF was much reduced in control animal in comparison with the MF of corresponding groups in mating behaviour test where the penis had not been anaesthetized. However, the test for libido revealed that Intromission and Ejaculation were present in control and experimental groups of animals. Thus, it may be inferred that the test drug produced a striking increase in 'pure' libido. Similar finding was also recorded by Tajuddin, et al [37], while working on ethanolic extracts of *Myristica fragrans* and *Syzygium aromaticum* in male rats.

The penile erection index is important for evaluating the effect of drug administration on erectile function [25]. The potency test showed that the aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed at the dose level of 100, 200 and 400 mg/kg body weight significantly increased the frequency of Erection (E), Quick Flips (QF) and Long Flips (LF) as compared to control group, but to a lesser degree than in Viagra treated rats. The aggregate of these penile reflexes (TPR) also significantly increased in both experimental and standard animals. This indicates that all the above extract of *Psoralea corylifolia* seed also increase potency. These conclusions are further supported by an earlier study reporting potency increasing effect of *Eurycoma longifolia* in rats [38].

Administration of the aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed at the dose level of 100, 200 and 400 mg/kg body weight modified the rat orientation activities, these act as a main determinant for measuring male sexual behaviour [39]. The result of the present study revealed a significant increase in penile erection and genital grooming. The increase of penile erection induced by *Psoralea corylifolia* could be due to their androgenic effects [40]. Similarly all the extracts in the orientation activities study of sexually experienced male rats showed significantly more frequent and vigorous licking and anogenital sniffing towards the receptive females, increased grooming of the genitals as compared to control. All these indices resulted into significant increase in sexual motivation and vigor [41].

In the present study, aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed at the dose level of 100, 200 and 400 mg/kg body weight of extract resulted in weight gain in treated animals. The weight of the organs likes testes, seminal vesicle, penis, epididymis, vas-deference and prostrate also increased significantly along with vital organs like liver, kidney, spleen and adrenal glands. Genesis of steroids is one of the causes of increased body and sexual organ weight and an increase in these parameters could be regarded as a biological indicator for effectiveness of the plant extract in improving the genesis of steroidal hormones [25]. Since androgenic effect is attributable to testosterone levels in blood [26], it is likely that the plant extracts may have a role in testosterone secretion allowing better availability of hormone to gonads.Testosterone supplementation has previously been shown to improve sexual function and libido [42], in addition to the intensity of orgasm and ejaculations which might also be expected to improve [43]. Similar conclusion was recorded by Watcho, et al [44], while working on hexane extract of *Mondia whitei* on the reproductive organ of male rats.

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5. CONCLUSION

The aphrodisiac activity lends support to the claims for its traditional usage of *Psoralea corylifolia* as a sexual function enhancing medicine. Thus, this study may prove to be an effective and safe alternative remedy in sexual disorders. Work is in progress on the isolation and characterization of the aphrodisiac principle in the plant extract, the actual mechanism of action of the crude extract and bioactive agents.

6. REFERENCES

1. Islam MW, Tariq M, Ageel AM, Al-Said MS and Al-Yhya AM. Effect of *Salvia hematodes* on sexual behaviour of male rats. J. Ethnopharmacol, 1991; 33: 67- 72.
2. Puri HS. Vegetable aphrodisiac of India. OQ J. Crude Drug Res, 1971; 11: 1742- 1748.
3. Noumi E, Amvan ZPH, Lontsi D. Aphrodisiac plants used in Cameroon. Fitotherapia, 1998; 69:125- 134.
4. Amin ES, Awad O, El- Samad MA, Iskander MN. Pharmacological studies on pollen grains of dates (*Phoenix dactylefera*). Phytochemistry, 1969; 8: 295- 298.
5. Yakubu MT, Bilbis LS, Lawal M, Akanji MA. Effect of repeated administration of Sildenafil citrate on selected enzyme activities of liver and kidney of male rats. Nig. J. Pure. Appl. Sci, 2003; 18: 1395- 400.
6. Ogah G. Impotence. Nig. J. Gen. Pract, 1999; 3: 30- 41.
7. Mahesh B, Satish S. Antimicrobial activity of some important medicinal plant against plant and human pathogens. World J. Agricultural Sci, 2008, 4: 839-843.
8. Sharma AR, Verma, Ramteke P. Antibacterial activity of some medicinal plants used by tribals against causing pathogens. World Applied Sci. J, 2009; 7(3): 332-339.
9. Arunkumar S, Muthuselvam M. Analysis of phytochemical constituents and antimicrobial activities of *Aloe vera* L. against clinical pathogens. World J. Agricultural Sci, 2009; 5(5): 572-576.
10. Sarawat AK, Chand S. Continuous somatic embryogenesis and plant regeneration from hypocotyl segments of *Psoralea corylifolia* Linn. An endangered and medicinally important Fabcaceae plant. Current Sci, 2001; 18(10): 1328-1331.
11. Latha PG, Panikkar KR. Inhibition of Chemical carcinogenesis by *Psoralea corylifolia* seeds. J Ethnopharmacol, 1999; 68(1-3): 295-298.
12. Thimmaiah SR *Standard methods of biochemical analysis*. 2nd ed. New Delhi: Kalyani Press; 2004.
13. OECD, Guidance for testing of chemicals, Acute Oral Toxicity-Acute Toxic Class Method 2001; 17: 423.
14. Dewsbury DA, Davis HN Jr. Effect of Reserpine on the copulatory behaviour of male rats. Physiol. Behav, 1970; 5: 1331-1333.
15. Szechtman H, Moshe H, Rabi S. Sexual behaviour pain sensitivity and stimulates endogenous opioid in male rats. Eur. J. Pharmacol, 1981; 70: 279- 285.
16. Amin KMY, Khan MN, Raheman SZ, Khan NA. Sexual improving effects of *Mucuna prurience* in sexually normal male rats. Fitoterapia, 1996; 67: 53- 58.
36. Guohua H, Yanhua I, Rengang M, Dongzhi W, Zhengzhi M, Hua Z. Aphrodisiac properties of *Allium tuberosum* seeds extract. J. Ethnophormacol, 2009; 122: 579- 582.
17. Sooriya RWD, Dharmasiri MG. Effect of *Terminalia catappa* seeds on sexual behaviour and fertility of male rats. Asian J. Androl, 2000; 2: 213-219.
18. Yakubu MT. Aphrodisiac potentials and toxicological evaluation of aqueous extract of *Fadogia agrestis* (Schweinf. Ex Hiern) stem in male rats. Ph.D. Thesis, University of Ilorin, Ilorin, Nigeria; 2006.
19. Davidson JM. Sexology: Sexual biology, behaviour and therapy: selected papers of Fifth World Congress of Sexology; 1981 Jerusalem Edited by: Zewi H. Excerpta Medica, Amesterdam-Princeton – Oxford 1982; 42-47.
20. Hart BL, Haugen CM. Activation of sexual reflexes in male rats by spinal implementation of testosterone. Physiol. Behav, 1968; 3:735-738.
21. Hart BL. Activation of sexual reflexes in male rats by dihydrotestosterone but not estrogen. Physiol. Behav, 1979, 23:107-109.
22. Tajuddin, Ahmad S, Latif A, Ahmad IQ, Yusuf AKM. An experimental study of sexual function improving effect of *Myristica fragrans* Houtt (nutmeg). BMC Complementary and Alternative Medicine, 2005, 5: 16-14.
23. Sharma V, Thakur M, Chavhan SN, Dixit VK. Valuation of the anabolic, aphrodisiac and reproductive activity of *Anacyclus pyrethrum* DC in Male Rats. Scientia Pharmaceutica, 2009; 77: 97–110.
24. Thakur M, Dixit VK. Effect of *Chlorophytum borivilianum* on androgenic sexual behaviour of male rats. Indian Drugs, 2006; 43: 300- 306.
25. Thakur M, Dixit VK. Aphrodisiac activity of *Dactylorhiza hatagirea* (D. Don) Soo in male albino rats. Evid. Based Compl. Alternate Med, 2007; 4: 29- 31.
26. Amini A, Kamkar F. The effects of gossypol on spermatogenesis in NMRI mice. Iranian J. Sci. and Technol. Trans. 2005; 29: 123-133.
27. Mahajan BK *Methods in Biostatistics for Medical and Research Worker.* 6th ed. New Delhi: JAYPEE Brothers Publication; 1997.
28. Harbone JB *Methods of extraction and isolation. In: Phytochemical methods: A guide to modern technique of plant analysis.* 4th ed. London: Chapman and Hall; 1998.
29. Shukla VN, Khanuja SPS. Chemical, Pharmacological and botanical studies on *Pedalium murex*. J Med Aromatic Plant Sci 2004; 26: 64- 96.
30. Singh S, Gupta YK. Aphrodisiac activity of *Tribulus terrestris* Linn. in experimental models in rats. J. Men's Health, 2011; 8(1): 575-577.
31. Gauthaman K, Adaikan PG. The hormonal effect of *Tribulus Terrestris* and role its role in the management of erectile dysfunction- an evaluation using primates rabbit and rats. Phytomedicine, 2008; 15 (1): 44- 54.
32. Padashetty SA, Mishra SH. Aphrodisiac studies of *Tricholepis glaberrima* with supportive action from antioxidant enzyme. Pharmaceutical Biol, 2007; 45 (7): 580- 586.
33. Adimoelja A. Phytochemicals and the breakthrough of traditional herbs in the management of sexual dysfunctions. Int. J. Androl, 2000; 23 (2): 82- 84.
34. Neill D, Vogel G, Hagler M, Kors D, Hennesey A. Diminished sexual activity in a new animal model of depression. Neurosci. Biobehav. Rev, 1990; 14:73–76.
35. Wattanathorn J, Pangphukiew P, Muchimapura S, Sripanidkulchai K, Sripanidkulchai B. Aphrodisiac activity of *Kaempferia parviflora*. Am. J. Agric. Biol. Sci, 2012; 7: 114- 120.
37. Tajuddin, Ahmad S, Latif A. Ahmad IQ. Aphrodisiac activity of 50% ethanolic extracts of *Myristica fragrans* Houtt. (nutmeg) and *Syzygium aromaticum* (L) Merr. and Perry. (clove) in male

mice: a comparative study. BMC Complementary and Alternative Medicine 2003; 3: 6- 12.
38. Ang HH, Cheang HS. Effect of *Eurycoma longifolia* Jack on laevator ani muscle in both uncastrated and testosterone-stimulated castrated intact male rats. Arch. Pharm. Res, 2001; 24:437- 440.
39. Morales A, Surridge DHC, Marshall PG, Fenemote J. Nonhormonal pharmacology treatment of organic impotence. J. Urol, 1982; 128:45–47.
40. Bahmanpour S, Talaei T , Vojdani Z, Panjehshahin M R, Poostpasand A, Zareei S, Ghaeminia M. Effect of *Phoenix Dactylifera* pollen on sperm parameters and reproductive system of adult male rats. Indian J. Med. Sci, 2006; 31(4):208-212.
41. Ang HH, Sim MK. *Eurycoma longifolia* Jack and orientation activities in sexually qualities in middle aged male rats. Phytother. Res, 2001; 15: 308- 313.
42. Aversa A, Fabbri A. New oral agents for erectile dysfunction: what is changing in our practice? Asian J. Androl, 2001; 3: 175-179.
43. Morels A, Androgen supplementation in practice: the treatment of erectile dysfunction associated with hypotestosteronemia. In BJ Oddens, Vermeulen A editor. Androgens and aging male. London: Parthenon Publishing Group; 1996. pp. 233- 245.
44. Watcho P, Donfack MM, Zelefack F, Nguelefack TB, Wansi S, Ngoula F, Kamanyi A. Effects of the hexane extract of *Mondia whitei* on the reproductive organ of male rat. Afr. J. Trad. CAM, 2005; 2 (3): 302- 311.

Treatment groups	Parameters						
	Doses (mg/kg Body wt)	Mount Frequency (MF)	Intromission Frequency (IF)	Mount Latency (in S)	Intromission Latency (in S)	Ejaculation Latency (in S)	Post- ejaculatory interval (PEI) (in S)
Group- I Control	Vehicle	3.33±0.33	2.33±0.33	187.8±13.2	251.4±1.47	262.8±5.73	680.4±22.2
Group- II Aqueous extract	100	4.00±0.36*	4.16±0.47 ^{ns}	135.3±27.6***	184.8±10.8 ^{ns}	252.2±7.89 ^{ns}	678±10.8 ^{ns}
	200	4.5±0.44 ^{ns}	4.66±0.33***	128.4±36.0**	156.6±39.6***	278±10.4 ^{ns}	668.4±12.02 ^{ns}
	400	5.33±0.33**	5.5±0.34***	101. 4±5.4***	145.2±9.0***	294±9.34*	664.8±11.4 ^{ns}
Group- III Alcoholic extract	100	3.5±0.42 ^{ns}	3.16±0.30***	126.6±3.0**	209±36.0***	Absent	Absent
	200	4.33±0.05***	3.33±0.33***	117.48±3.6***	192.9±9.6*	Absent	Absent
	400	5±0.36*	4.16±0.40***	139.8±5.4*	174.6±28.8***	322±19.8*	547.2±10.2***
Group- IV Chloroform extract	100	5.6±0.56*	22.5±1.41***	123±12.6*	177.6±9.0 ^{ns}	360±10.0***	382.2±70.40**
	200	7.5±1.20***	26.66±0.88***	134.4±5.4*	119.4±10.2***	382±51.0*	374.4±2.86***
	400	9.6±0.66***	28.5±0.76***	101.79±20.4*	109.8±9.0***	422.4±10.5***	333±11.4***
Group- V Sildenafil citrate	5	6.5±0.36***	5.66±0.33***	138.6±7.2*	142.19±6.6***	454.3±15.6***	338±9.6***

Values in Mean±S.E. (Standard error), n=6, *P<0.05, **P<0.01, ***P<0.001, when compared with control, ns- non significant.

Table 1: Effect of aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed on mating behaviour in male rats

Treatment groups	Parameters							
	Doses (mg/kg Body wt)	% Index of libido	% Mounted	% Intromitted	Intromission ratio	%Ejaculated	% Copularory Efficiency	Intercopulatory interval (in S)
Group- I Control	Vehicle	67	67	83	0.41	67	100	721±10.8
Group- II Aqueous extract	100	33	83	83	0.50	67	100	397.8±19.2*
	200	50	100	83	0.50	83	83	354±20.07**
	400	50	100	100	0.50	83	100	337.4±16.15**
Group- III Alcoholic extract	100	50	100	100	0.47	Absent	100	562.2±9.6***
	200	67	100	100	0.45	Absent	100	534±7.8***
	400	83	100	100	0.45	67	100	432±8.4**
Group- IV Chloroform extract	100	100	100	100	0.80	83	100	80.7±1.96***
	200	100	100	100	0.78	100	100	68.4±7.2***
	400	100	100	100	0.74	100	100	65±6.6***
Group- V Sildenafil citrate	5	83	100	100	0.50	100	100	306.6±16.71***

Values in Mean±S.E. (Standard error), n=6, *P<0.05, **P<0.01, ***P<0.001, when compared with control, ns- non significant.

Table 2: Effect of aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed on computed male rat sexual behaviour parameters

Treatment groups	Parameters			
	Doses (mg/kg body wt.)	Mounting Frequency (MF)	Intromission Frequency (IF)	Ejaculation (EJ)
Group- I Control	Vehicle	4.8±0.47	4±0.36	Absent
Group- II Aqueous extract	100	7.33±0.49*	Nil	Absent
	200	7.83±0.47**	Nil	Absent
	400	8.11±0.50***	Nil	Absent
Group- III Alcoholic extract	100	10±0.57***	2.44±0.42^{ns}	Absent
	200	12.16±0.60***	3.5±0.42**	Absent
	400	13.33±0.80***	4.66±0.33^{ns}	Absent
Group- IV Chloroform extract	100	11.66±0.56***	8.33±0.92**	Present
	200	13.48±0.48***	9±0.36***	Present
	400	17.66±0.42***	11±0.44***	Present
Group- V Sildenafil citrate	5	17.83±0.70***	9.5±0.56***	Present

Values in Mean± S.E. (Standard error), n=6, *P<0.05, **P<0.01, ***P<0.001, when compared with control, ns- non significant

Table 3: Effect of aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed on mounting frequency (test for libido) in male rats

Treatment groups	Parameters				
	Doses (mg/kg Body wt)	Erection (E)	Quick Flips (QF)	Long Flips (LF)	Total Penile Reflexes (TPR)
Group- I Control	Vehicle	8.0±0.57	6.56±0.11	4.21±0.12	19.24±0.80
Group- II Aqueous extract	100	8.71±0.18^{ns}	7.27±0.12^{ns}	5.36±0.43^{ns}	21.34±1.46^{ns}
	200	8.79±0.10^{ns}	7.75±0.51^{ns}	6.36±0.50*	22.99±1.11*
	400	9.05±1.62*	8.18±0.14*	6.95±0.049***	24.18±1.80**
Group- III Alcoholic extract	100	12.15±0.067***	10.49±0.05***	9.16±0.21***	31.8±0.32***
	200	12.91±0.070*	10.86±0.04***	10.13±0.10***	33.9±0.21***
	400	13.48±0.096***	11.03±0.05***	12.49±0.34***	37±0.48***
Group- IV Chloroform extract	100	13.5±0.42^{ns}	10.5±0.62^{ns}	12.33±0.33***	36.33±1.37*
	200	14.5±0.42*	12.5±0.42***	13.5±0.42***	40.5±1.26***
	400	16±0.40**	13.16±0.60***	15.66±0.33***	44.82±1.33***
Group- V Sildenafil citrate	5	18.18±0.30***	19±0.26***	16.36±0.28***	53.54±0.84***

Values in Mean±S.E. (Standard error), n=6, *P<0.05, **P<0.01, ***P<0.001, when compared with control, ns- non significant.

Table 4: Effect of aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed on penile reflexes (test for potency) in male rats

Treatment groups	Doses (mg/kg Body wt)	Mean activity score towards Female		Mean activity score towards Environment			Mean activity Score towards Self	
		Licking	Anogenital smelling	Exploration	Rarring	Climbing	Nongenital grooming	Genital grooming
Group- I Control	Vehicle	17±0.85	11±0.73	23.33±1.66	27.33±1.42	05±1.24	22.16±0.98	28±0.33
Group- II Aqueous extract	100	19.83±1.25^{ns}	11..5±0.31^{ns}	22±0.40^{ns}	23.16±1.08*	04±.86**	22.33±1.68^{ns}	19.83±1.82***
	200	21.66±1.05*	13±1.34**	20±1.53^{ns}	23±1.68^{ns}	05.16±.64^{ns}	22.16±1.42^{ns}	21±1.36**
	400	22±1.41^{ns}	17±0.76**	19.33±1.42*	22.66±1.42**	04±1.32*	21.83±1.71*	24±2.16*
Group- III Alcoholic extract	100	24±1.92*	14±0.80*	22±1.69^{ns}	23.5±0.94^{ns}	4.5±0.66^{ns}	22.83±0.48^{ns}	24.16±1.32**
	200	25±0.99***	19.66±1.52*	17±4.6*	18±0.80*	03±0.18***	21±0.78*	28.83±1.55^{ns}
	400	28.5±1.01***	22±1.41**	13±1.06**	15.83±0.54**	03±0.35**	18±1.62**	31±0.43*
Group- IV Chloroform extract	100	24±0.97***	25.8±0.90***	11.16±1.17***	17.16±1.34**	03±0.46*	20±1.32*	29±0.88^{ns}
	200	29.5±1.26***	27.33±0.38***	10.5±0.74*	12±1.02***	03±0.16***	17.16±1.76***	32.33±1.62***
	400	31.5±1.15***	27.83±1.08**	8.16±0.60***	11.33±0.33***	02±0.38***	15.83±2.15***	34.16±1.04***
Group- V Sildenafil citrate	5	26.5±1.57***	23±0.70***	19±0.78	13±0.48**	03±0.23***	17±1.34***	36±2.42***

Values in Mean±S.E. (Standard error), n=6, *P<0.05, **P<0.01, ***P<0.001, when compared with control, ns- non significant.

Table 5: Effect of aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed on orientation activities in male rats

Treatment groups	Doses (mg/kg Body wt)	Body weight (g)		Relative organ weight (%)									
		Initial	Final	Testes	Epididymis	Seminal vesicle	Ventral prostate	Vas-Deferens	Penis	Liver	Kidney	Adrenal Gland	Spleen
Group- I Control	Vehicle	189.1±3.28	191.8± 2.11	1.694± 0.08	1.084±0.09	0.421± 0.02	0.149± 0.01	0.332 ±0.01	0.134± 0.11	3.752± 0.13	1.305± 0.01	0.024± 0.03	0.239± 0.03
Group- II Aqueous extract	100	171.6±1.91	194.4± 0.48**	1.819± 0.05*	0.932±0.09 ns	0.382± 0.07**	0.105± 0.08 ns	0.271± 0.04*	0.121± 0.07*	3.676± 0.45 ns	1.479± 0.14**	0.024 ±0.02 ns	0.192± 0.02*
	200	193±1.70	214.6± 1.80*	1.538± 0.58ns	0.945±0. 03 ns	0.393± 0.04*	0.125± 0.04 ns	0.315± 0.12 ns	0.128± 0.02 ns	3.378± 0.18**	1.099± 0.11*	0.024 ±0.01 ns	0.171± 0.01***
	400	212.5±3.00	229.8± 1.39***	1.854± 0.43**	1.073±0.11 ns	0.402± 0.01 ns	0.142± 0.08 ns	0.376± 0.05***	0.122± 0.01*	4.232± 0.58***	1.152± 0.15 ns	0.025 ±0.02*	0.244± 0.03**
Group- III Alcoholic extract	100	171.5±4.04	191.16±2.01 ns	1.813± 0.28***	1.247±0.28**	0.399± 0.01*	0.155± 0.02**	0.307± 0.02**	0.155± 0.01**	3.396± 0.24**	1.387± 0.24 ns	0.029 ±0.03**	0.220± 0.04**
	200	189.1±3.28	196.66±2.11*	1.858 ±0.31**	1.169±0.13**	0.428± 0.02 ns	0.156± 0.01***	0.335± 0.01*	0.134± 0.01 ns	3.895± 0.16 ns	1.493± 0.38**	0.027 ±0.01**	0.233± 0.02 ns
	400	177.6±1.91	183.35±2.21**	2.033± 0.20***	1.334±0.47***	0.448± 0.04**	0.164± 0.05**	0.388± 0.06***	0.150± 0.02**	4.022± 0.18***	1.551± 0.24***	0.033 ±0.04***	0.255± 0.01**
Group- IV Chloroform extract	100	179.6±1.71	194.43±0.48**	1.583 ±0.68 ns	1.062±.0.39 ns	0.318± 0.02**	0.176± 0.24***	0.311± 0.05**	0.112± 0.01**	3.469± 0.26 ns	1.332± 0.34 ns	0.025 ±0.02*	0.198± 0.03***
	200	194.8±1.76	213± 1.80***	1.826 ±0.70**	1.188±0.32***	0.417± 0.04**	0.135± 0.01 ns	0.345± 0.02***	0.160± 0.02***	3.020± 0.40*	1.170± 0.46**	0.025 ±0.01 ns	0.239± 0.02***
	400	230.1±1.18	251± 1.83***	1.583±0.84*	1.307±0.21***	0.498± 0.07***	0.154 ±0..07*	0.354± 0.04***	0.168± 0.03***	3.951± 0.60**	1.526± 0.32***	0.024 ±0.02 ns	0.260± 0.01***
Group- V Sildenafil citrate	5	196.6±2.11	198.66±5.67***	2.005± 0.06***	1.328±0.13***	0.448± 0.05**	0.184± 0.01***	0.331± 0.01 ns	0.139± 0.05*	3.991± 0.17***	1.342± 0.1***	0.026 ±0.03**	0.185± 0.01**

Mean±S.E. (Standard error), n=6, *P<0.05, **P<0.01, ***P<0.001, when compared with control, ns- non significant

Table 6: Effect of aqueous, alcohol and chloroform extract of *Psoralea corylifolia* seed on body weight, male reproductive organ and vital organ weights of male rats

Conflict of Interest: None Declared

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