

Eurycoma longifolia Jack Enhances Libido in Sexually Experienced Male Rats

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Abstract: The effects of *Eurycoma longifolia* Jack were studied on the libido of sexually experienced male rats after dosing them with 200, 400 and 800 mg/kg body weight twice daily of different fractions of *E. longifolia* Jack for 10 days. Results showed that *E. longifolia* Jack produced a dose-dependent increase in mounting frequency of the treated animals with 400 mg/kg of chloroform, methanol, water and butanol fractions resulting in mounting frequencies of 5.3 ± 1.2 , 4.9 ± 0.7 , 4.8 ± 0.7 and 5.2 ± 0.1 , and 800 mg/kg further increased them to 5.4 ± 0.8 , 5.4 ± 0.8 , 5.2 ± 0.6 and 5.3 ± 0.2 respectively but there were no erections, intromissions, ejaculations or seminal emissions during the 20-min observation period which allowed for the measurement of sexual arousal reflected by mounting frequency uninfluenced by other behavioural components. This study provides evidence that *E. longifolia* Jack is a potent stimulator of sexual arousal in sexually vigorous male rats in the absence of feedback from genital sensation.

Key words: *E. longifolia* Jack, libido, sexually experienced male rats

Introduction

Eurycoma longifolia Jack (Simaroubaceae), identified by its local name as Tongkat Ali, is a tall, slender, shrub-tree and is commonly found along the hilly jungle slopes of Malaysia. Over the years, pharmacological evaluations on the various compounds obtained from this plant showed that it exhibited antimalarial [2–5, 11], cytotoxic [9–11, 14–15], antiulcer [17] and anti-pyretic [6] properties.

But in Malaysia it has gained notoreity as a male aphrodisiac since it is reputed to increase male prowess [8] but this claim is largely based on opinion rather

than scientific verification. Hence, this present study was undertaken to further investigate the effects of *E. longifolia* Jack on the libido of sexually experienced male rats after treating them with different fractions of *E. longifolia* Jack for 10 days.

Materials and Methods

Animals: Two hundred and forty inbred Spraque-Dawley strain of male albino rats, 3–4 months old, were used. Each male rat was kept together with a non-experimental female rat in a cage, at a temperature of $26 \pm 2^\circ\text{C}$ in lighting for 12 hr (lights on 0800–2000 hr)

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and a relative humidity of around $70 \pm 5^\circ\text{C}$, with food and tap water available *ad lib*.

Test compounds: *E. longifolia* Jack roots were obtained from Langkawi Island in Malaysia. This plant was identified by comparison with an authentic sample previously deposited at the School of Pharmaceutical Sciences, University of Science Malaysia, Malaysia [4]. The roots were then milled and were subsequently defatted with petroleum ether before being extracted with methanol. The dried methanol residue was then partitioned between chloroform and water (2:1) to yield the chloroform extract and the aqueous layer. The aqueous layer was then extracted with *n*-butanol.

Test extracts were given twice daily with an appropriate oral needle for 10 days prior to the test. Vehicles used were propylene glycol and distilled water for chloroform and non-chloroform fractions respectively. Each male rat in the respective groups received 200, 400 and 800 mg/kg of the above fractions whilst the control group received 3 ml/kg of normal saline.

Test for libido: This test was performed at the beginning of the dark phase of the light-dark cycle and in subdued light. After dosing the sexually experienced male rats with their respective doses of different fractions of *E. longifolia* Jack for 10 days, they were observed for MF (mount frequency), IF (intromission frequency) and ejaculation frequency (EF) on the 11th day. The penis of each sexually experienced male rat was exposed by retracting the sheath and 5% xylocaine ointment was applied 20 min before starting observation. Unless stated otherwise, all tests lasted for 20 min after treating the penis.

During the test, each male rat was placed individually in a cage with a receptive female. Female rats used as mating stimuli were made receptive by being bilaterally ovariectomized via lumbar incisions under phenobarbitone anaesthesia approximately 1 month prior to testing. They were later brought to heat artificially with a single subcutaneous dose of 10 μg estradiol benzoate (Sigma Chemical, USA) and 500 μg of progesterone (Sigma Chemical, USA), 48 hr and 4 hr before testing, respectively. It was shown that estradiol benzoate induced in the ovariectomized rat a specific urge to seek contact with a sexual active male [12–13].

Furthermore, only receptive females were chosen in this study and this was shown by the lordotic reflex in

response to manual stimulation of the vaginal region and also confirmed by the vaginal smear. Besides these, they were further tested with non-experimental male rats to further ensure receptivity before testing.

Statistical Analysis: The mean values for the observed parameters of the treated and control groups were statistically analysed by analysis of variance (ANOVA) 2-way layout completely randomised design followed by ANOVA 1-way layout completely randomised design and subsequently, Duncan's multiple test at 0.05 significant level [16].

Results and Discussion

Sexual arousal or motivation with mount tests following penile anesthetization is a reliable index of pure libido unaffected by the reinforcing effect of genital sensation [1, 7].

Table 1 shows the effects of different fractions of *E. longifolia* Jack on MF, IF and EF on sexually experienced male rats after treating them for 10 days. Results showed that *E. longifolia* Jack produced response in the MF of the sexually experienced male rats with lower doses of *E. longifolia* Jack not producing a significant increase in MF ($p > 0.05$) when compared with the controls, but at higher doses increased the MF in the treated males ($p < 0.05$) when compared with the controls. With 400 mg/kg of chloroform, methanol, water and butanol fractions exhibited MF of 5.3 ± 1.2 , 4.9 ± 0.7 , 4.8 ± 0.7 and 5.2 ± 0.1 whilst 800 mg/kg further increased them to 5.4 ± 0.9 , 5.4 ± 0.8 , 5.2 ± 0.6 and 5.3 ± 0.2 , respectively. But there were no erections, intromissions, ejaculations or seminal emissions during the 20-min observation period. It was also found that not much difference was obtained in the MF after dosing the rats with 800 mg/kg of various fractions of *E. longifolia* Jack and this may be attributed to the presence of the active constituents which are present in more than one fractions.

In general these results indicated that sexually experienced male rats treated with *E. longifolia* Jack exhibited around 1.2 times as much mounting behaviour during the observation period as did the controls and during the males' exposure to females, it was found that this procedure successfully eliminated erection, intromission and ejaculation, thereby allowing measurement of sexual arousal as reflected by mount-

Table 1. Effects of *E. longifolia* Jack on MF, IF and EF in Sexually Experienced Male Rats

Treatment	Dose (mg/kg)	n	Mean score \pm SEM		
			MF	IF	EF
Control	–	20	3.9 \pm 1.1	Absent	Absent
@Chloroform	200	20	4.2 \pm 1.2	Absent	Absent
	400	20	5.3 \pm 1.2*	Absent	Absent
	800	20	5.4 \pm 0.9*	Absent	Absent
@Methanol	200	20	4.2 \pm 0.8	Absent	Absent
	400	20	4.9 \pm 0.7*	Absent	Absent
	800	20	5.4 \pm 0.8*	Absent	Absent
@Water	200	20	4.4 \pm 0.6	Absent	Absent
	400	20	4.8 \pm 0.7*	Absent	Absent
	800	20	5.2 \pm 0.6*	Absent	Absent
@Butanol	200	20	4.0 \pm 1.2	Absent	Absent
	400	20	5.2 \pm 0.1*	Absent	Absent
	800	20	5.3 \pm 0.2*	Absent	Absent

n: number of animals used in each group, @: Fractions obtained from *E. longifolia* Jack, *: $p < 0.05$ significantly different from control.

ing frequency uninfluenced by other behavioural components.

In conclusion, this study shows that different fractions of *E. longifolia* Jack enhanced the libido in sexually experienced male rats, providing evidence that *E. longifolia* Jack is a potent stimulator of sexual arousal in intact, sexually vigorous male rats in the absence of feedback from genital sensation.

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