International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 04 Apr. 2024, pp: 389-392 www.ijaem.net ISSN: 2395-5252

Effect of Aqueous Extract of Sida Acuta Root on Sexual Behavior of Male Wistar Rats

By Daniel I. Bdliya[1], Lydia Daniel[2]

1. *Department of Chemistry, Umar Ibrahim Ibn-Elkanemi College of Science and Technology, Bama, Borno State, Nigeria*
2. *Lydia Daniel, Family Medicine, Federal Teaching Hospital Gombe, Gombe State, Nigeria*

Date of Submission: 05-04-2024 Date of Acceptance: 14-04-2024

ABSTRACT

Traditional medicinal plants are widely used as therapy that helps improve health. A plant root was found to improve the sexual behaviors of male rats "The ability to attain and/or maintain penile erection sufficient for satisfactory sexual performance or satisfaction" was enhanced by the plant extract of sida Acuta root. Traditional medicines are globally used and have rapidly grown in economic importance. Intrinsically active compounds are well-known for their vigor, libido, and potency. The study was conducted to extract the effect of the Aqueous Extract of Sida Acuta Root on the Sexual Behaviour of Male Wistar Rats. The experimental study was carried out on 48 Wistar strain rats (16 male and 32 female). The animals were raised in cages and the male rats were divided into 4 groups (n = 4 rats/group), group A was the control while groups B, C, and D were administered various doses of the plant extract incorporated in food.

The female rats were receptive by administering estradiol Benzoate and Progesterone at 10ug/100mg and 0.5ug/100mg of body weight respectively several hours before pairing. The sexual behavior test was performed according to the groups. The results of the treated groups showed a significant increase in mating frequency and latency, intromission frequency, latency, and ejaculating latency compared to the control group. Overall, the results showed that Aqueous Extract of Sida Acuta significantly affects the sexual behavior of the male rats. The extract increased sexual behavior and orientation activity performance recorded in the treated animals. Thus, this study found that the Aqueous Extract of Sida Acuta Root has a significant effect on the rats' sexual behavior.

I. LITERATURE REVIEW

Plant materials are central to traditional medical practices and have remained useful. sources of new drugs (O'Brien, 2004). Management of degenerative diseases such as mental illness, sexual dysfunction, and microbial infections is one area in which a lot of people in developing countries depend on herbal medicine (Adimoelja, 2000; Ajali, 2002 Any substance that increases erectile function, sexual performance, and enjoyment is considered an aphrodisiac (Sewani-Rusike at al., 2015). An aphrodisiac is defined as any substance that enhances sex drive or desire. In reality, any substance that increases erectile function, sexual performance, and enjoyment has been considered an aphrodisiac (Thakur et al., 2009; Wani B.A, et al.,2011).

Masculinity encompasses sexual potency as one of its determinants. Indeed, the humiliation associated with failures of sexual performance is common across various cultures. As a result, many men do not disclose aspects of sexual dysfunction to their physicians. This has therefore maintained the popularity of aphrodisiacs for centuries. The knowledge of aphrodisiacs is passed down from generation to generation (Sewani-Rusike et al., 2015).

Medicinal plants serve as critical therapeutic agents and valuable raw materials for manufacturing numerous traditional and modern medicines. In many developing countries, traditional medicine remains the mainstay of health care, and most of the drugs and cures come from natural sources, such as a plant (Motaleb et al., 2011). Additionally, aphrodisiac activity has been attributed to nutritional boost by the agent leading to improved well-being and hence boosting sexual performance and libido (Yakubu et al., 2007;

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 04 Apr. 2024, pp: 389-392 www.ijaem.net ISSN: 2395-5252

Sumalatha et al., 2010). As such, some food plants are associated with improved sexual potency, relieving sexual dysfunction and increasing male fertility. Such food plants as garlic (Malviya et al., 2011), asparagus (Wani J.A. et al., 2011), Garcinia kola (Ralebona et al., 2012), and Mondia whitei (Watcho et al., 2007; Quasie et al., 2008) have been shown to improve erectile function and sexual performance in experimental animals.

Plants produce a wide range of secondary metabolites such as phenolic compounds, alkaloids, vitamins, terpenoids, and other secondary metabolites with proven antioxidant activity (Kaur and Kapoor 2002; Wojdylo et al., 2007). Erectile dysfunction is one of the sexual dysfunctions that can be caused by psychological disorders like anxiety, depression, stress, cerebral trauma, Alzheimer's, Parkinson's disease; chronic disorders – diabetes, hypertension, vascular insufficiency, atherosclerosis; penile diseases - phimosis, peyronies; lifestyle – chronic alcohol abuse, cigarette smoking; aging – decrease in hormone level with age; Systemic diseases – Cardiac, hepatic, renal, pulmonary; Organ diseases like hypogonadism and hyperprolactinemia; and cancer (Mendoza et al., 2008;).

II. MATERIAL AND METHODS

Plant materials and extract preparation. The root was collected around the Chemistry laboratory of Umar Ibn Ibrahim El-Kanemi College of Education Science and Technology Bama, Borno State, Nigeria by one of the authors and identified herbarium of the University of Maiduguri, Borno State, Nigeria. The root was chopped and shade-dried to constant weight. It was then pulverized into a crude powder using a household blender. 100 grams was then socked in 500 cm^3 of distilled water for 24 hours with constant shaking on the shaker before filtering using Whatman No. 1 filter paper and the resultant extract was dried by evaporation at 40 ^{C} in an oven to constant weight. The product obtained was then reconstituted to the desired doses of 20mg, 50mg, and 200mg.

Animal grouping.

A total of 32 female and 16 male rats were used for the study. The male rats were divided into four groups each consisting of 4 animals. Group A is the which was administered normal water and food. Group B was administered 20mg of the extract incorporated into their food, group C was administered 50g, and Group C 200mg. The female rats were made receptive by administering 10µg/100g body weight of estradiol benzoate and 0.5mg/100g body weight of progesterone 48 hours and 4 hours respectively before pairing (T. Yakubu and M. A. Akanji 2011).

Mating Behavioural study

The mating behavioral tests were done following the modification of the procedures of Dewsbury 1970, Szechtman et al., 1981, Amin et al., 1996 and M. T. Yakubu and M. A. Akanji (2011). The male rats were trained with sexually receptive females, 3 times, for 4 days before the commencement of the experiment. The test was carried out between 19:00 and 22:00 h under a dim light. The female animals were artificially brought into oestrus (heat) by the successive administration of estradiol benzoate (10 µg/ 100 g body weight) and progesterone (0.5 mg/100 g body weight) through subcutaneous injections, 48 h, and 4 h respectively before pairing. This was done because the female rats only allowed mating during the oestrus phase. The receptive female rats were introduced to the male rats, 30 min after administration of the extract at the respective doses in a locally manufactured wooden cage with glass doors. The male rats were paired with the female rats in all the various doses including controls in the ratio 1:1 (1 female to 1 male). The observation for mating behavior commenced after 10 min of placing the paired animals in the cage and was recorded with the aid of a video camera on a tripod stand. The occurrence of events and phases of mating after the video recording were analyzed and the frequencies and phases determined. The parameters of male sexual behavior as defined by Hasim et al., (2014). The following parameters were observed during the 35 min observation period: "Mount latency (MF) and Intromission frequency (IF) - the number of mounts and intromissions from the time of introduction of the female until ejaculation), Mount (ML) and Intromission latency (IL) - the time interval between the introduction of the female and the first mount or intromission by the male and Ejaculation latency (EL) - the time interval between the first intromission and ejaculation".

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 04 Apr. 2024, pp: 389-392 www.ijaem.net ISSN: 2395-5252

III. RESULTS

Table 1. Single dose effects of treatment with extracts on male sexual behavior.

Parameter	Control	Doses on Test rats		
		20mg	50mg	200mg
ML (sec)	45.2 ± 0.3	63.1 ±0.6	67.2 ± 0.5	70.6 ± 0.5
IL (sec)	65.7 ± 0.1	67.2 ± 0.3	87.0 ± 0.5	95.8 ± 0.4
MF	24.7 ± 0.4	45.5 ± 0.2	48.8 ± 0.8	56.2 ± 0.5
IF	17.6 ± 0.6	32.4 ± 0.7	34.7 ± 0.3	38.8 ± 0.7
CE (%)	67.0 ± 0.7	82.3 ± 0.5	87.2 ± .7	96.8 ± 0.3
Ejac	7 ± 0.2	15.1 ± 0.6	17.3 ± 0.7	24.6 ± 0.6

IV. DISCUSSION

The proceptive behavior displayed by the female rats included ear-wiggling characterized by rapid anteroposterior vibration of the ears, a short run where the female rats suddenly stop and present her posterior to the male rats (darting), and a short jump with stiff legs followed by immobility and presentation (hopping) (Yakubu and Akanji, 2011). The male rats, upon introduction, responded with immediate advances toward the females and displayed precopulatory behavior such as chasing, and anogenital sniffing which eventually culminated in mounting. There was genital toileting after every mount that resulted in intromission. The extract produced no sedative effect on the male rats since none of the animals showed evidence of tiredness throughout the observatory period. Similarly, dot receptivity was not displayed by any of the female rats used in this study (Yakubu and Akanji, 2011).

From the table above the ML for the three groups is far above that of the control, however, the value for the 200mg is low showing that a higher dose of the extract does not have much effect on the mount latency. Mount Frequency and Intromission Frequency are useful indices of vigor, libido, and potency (Agmo, 1997). The IL followed the same trend as the ML. However, the mount frequency has a different pattern for the 200mg in that it is higher compared to the differences between 20mg and 50mg. The range differences for Intromission frequency to the doses administered. The increase in MF and IF following the administration of aqueous extract of M. acuminata stem at 1000mg/kg body weight on day 1 and subsequently at all the doses on other days of observation suggests enhanced libido (Tajuddin et al., 2004).

This sexual behavior may also be due to the androgenic and gonadotropic activities of M. acuminata stem in male rats reported in our previous study (Yakubu et al., 2005).

REFERENCES

[1]. Adimoelja A. Phytochemicals and the breakthrough of traditional herbs in the management of sexual dysfunction. Int J Androl, 2000; **23** (Suppl 2): 82-84.
[2]. Agmo, "Male rat sexual behavior," Brain Research Protocols, vol. 1, pp. 203–209, 1997.
[3]. Ajali U. 2002. Chemistry of bio-compounds. Enugu, Nigeria: Rhyce Kerex publishers.
[4]. Amin K. M. Y, Rahman S. Z. and Khan N.A (1996). Sexual function improving effect of Mucuna pruriens in sexually normal male rats. Fitoterapia. 67:53–8.
[5]. Cao J, Zhang P, XU C, Huang T, Bai Y, Chen K, Effect of aqueous extract of Arctium lappa L. (burdock) roots on the sexual behavior of male rats. BMC. Compl. and Altern. Med. 12;(2012):1–8.
[6]. Constance R. Sewani-Rusike, Jehu E. Iputo, Eugene J. Ndebia, Mavuto Gondwe, and David
[7]. R. Kamadyaapa (2015): A Comparative study on the Aphrodisiac activity of food plants Modia while, Chenopodium album, Cucurbita pepo, and Sclerocarya birrea extracts in male wister rats. African Journal of Traditional Complement Alternative Medicine. 12(2):22-26
[8]. Dewsbury DA, Daris HNS. Effects of reserpine on the copulatory behavior of male rats. Physio and behavior 5:1331-533
[9]. H. J. Kim, D. S. Woo, Lee, and J. J. Kim (1998)): "The relaxation effects of ginseng saponin in rabbit corporal smooth muscle:

is it a nitric oxide donor?" British Journal of Urology, vol. 82, no. 5, pp. 744–748.

[10]. Hashim S, Bakht T, Marwat KB, Jan A. Medicinal properties, phytochemistry and pharmacology of Tribulus Terrestris

[11]. K. Gauthaman, P. G. Adaikan, and R. N. V. Prasad, "Aphrodisiac

[12]. Kaur C, Kapoor HC (2002) Antioxidant activity and total phenolic content of some Asian vegetables. Int J Food Sci Tech 37:153-162.

[13]. L. S. Gill, Ethnomedical Uses of Plants in Nigeria, University of Benin Press, Benin, Nigeria, 1992. L.(Zygophyllaceae). Pakistan Journal of Botany. 2014;46(1):399-404.

[14]. Malviya, N., Jain, S., Gupta, V.B. and Vyas, S. (2011). Effect of garlic bulb on paroxetine- induced sexual dysfunction in male rats. Asian. J. Pharm. Biol. Res.

[15]. Mendoza-Lujambio I, Nachtigall LB, Dowsing AT, Chase CD. Infertility in male. Med J, 2008; **12:** 155-9.

[16]. Motaleb MA, Hossain MK, Sobhan I, Alan KM, Khan NA, Firoz R (2011)Selected Chihagnong Mll Tracts Medicinal Plants.IUCN (International Union Forb Conservation Of Nature), Dahaka, Bangladesh, ppxii+116.

[17]. O'Brien K. Complementary and alternative medicine: the move into mainstream health care. Clin Exp Optom, 2004; **87:** 193-194.

[18]. Quasie, O., Martey, O.N.K., Nyarko, A.K., Gbewonyo, W.S.K. and Okine, L.K.N. (2010). Modulation of penile erection in rabbits by Mondia whitei: Possible mechanism of action. Afr. J. Trad. CAM., 7(3): 241–252.

[19]. Ralebona, N., Sewani-Rusike, C.R., and Nkeh-Chungag, B.N. (2012). Effects of an ethanolic extract of Garcinia kola on sexual behavior and sperm parameters in male Wistar rats. Afr. J. Pharm. Pharmacol., 6(14):1077–1082. S.A. Taha, M.W. Islam, and A. M. Ageel (1995) "Effect of ambrein, a major constituent of ambergris, on masculine sexual behavior in rats," Archives Internationales de Pharmacodynamie et de Therapie, vol. 329, no. 2, pp. 283–294.

[20]. Sumalatha, K., Kumar, A.S. and Lashmi, S.M. (2010). Review of natural aphrodisiac potentials to treat sexual dysfunction. Int. J. Pharm. Ther., 1(1):6-14.

[21]. Szechtman H, Simantov R, Hershkowitz M. Sexual behaviors decrease pain sensitivity and stimulate endogenous opioids in male rats. Europ J of Pharm.

[22]. Tajuddin, S. Ahmad, A. Latif, and I. A. Qasmi (2004) "Effect of 50% ethanolic extract of Syzygium aromaticum (L.) Merr. & Perry. (clove) on the sexual behavior of normal male rats," BMC Complementary and Alternative Medicine, vol. 4, pp. 17–24.

[23]. Thakur, M., Chauhan, N.S., Bhargava, S. and Dixit, V.K. (2009). A comparative study on the aphrodisiac activity of some Ayurvedic herbs in male Albino rats. Arch. Sex. Behav., 38:1009- 1015.

[24]. Wani, B.A., Ganai, B.A., Ganaie, A.H., Bodha, R.H. and Mohiddin, F.A. (2011). Plants as a repository of aphrodisiacs. J. Pharm. Res., 4(11):3882-3887s

[25]. Wani, B.A., Ganai, B.A., Ganaie, A.H., Bodha, R.H. and Mohiddin, F.A. (2011). Plants as a repository of aphrodisiacs. J. Pharm. Res., 4(11):3882-3887.

[26]. Watcho, P., Zelefack, F., Nguelefack, T.B., Ngouela, S., Bo Telefo, P., Kamtchouing, P., Tsamo, E. and Kamanyi, A. (2007). Effects of aqueous and hexane extracts of Mondia whitei on the sexual behavior and some fertility parameters of sexually inexperienced male rats. Afr. J. Trad. CAM., 4(1):37-46.

[27]. Yakubu, M.T., Akanji, A.M. and Oladiji, A.T. (2005). Aphrodisiac potentials of the aqueous extract of Fadogia agrestis (Schweinf. Ex Hiern) stem in male albino rats. Asian J. Androl.