APHRODISIAC PROPERTY OF A NIGERIAN MEDICINAL PLANT Securidaca longepedunculata (WILD WISTERIA OR ‘UWAR MAGUNGUNA’) IN AN ALBINO RAT MODEL
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Abstract
This study on the medicinal plant Securidaca longepedunculata Fres, was carried out in order to assess its efficacy, as a prospective local aphrodisiac, on some 20 white or albino rats in two groups of 10 (5 males 5 females) plus a control group making a total of two groups. Fairly uniform conditions of age, weight, temperature, humidity, photoperiod, rat feed and water were maintained before administering the extracts in doses of 10 mg/kg, 100 mg/kg and 1000 mg/kg, according to the procedure of Lorke. The Penile Erection Index (PEI) for each group was determined within a 3-hour period of administration. PEI was calculated by taking the product of Mean episodes of sucking and mounting in the rat model and percentage rat showing at least one episode. Aphrodisiac property was implicated in the sample by very high PEI, from the lowest value of 24 to the highest value of 500, the standard being 22. The constituent active phytochemical ingredients in the sample must have been synergistically responsible for the observed aphrodisiac property.

Keywords: Securidaca longepedunculata, aphrodisiac, medicinal, albino rats, penile erection index

Introduction
Securidaca longepedunculata (Fres.) is a small flowering shrub 2 – 10 m tall, widespread throughout the savanna of tropical Africa. It has narrowly-elliptic leaves up to 6 cm long, erect stalks, 6 mm long that are almost touching. The bean-like flowers are bright purple or violet, sweet-scented and occurring in racemes. The fruit is about 5 cm long and winged laterally. S. longepedunculata is a traditional medicinal plant used by various ethnic groups in Nigeria. Throughout Northern Nigeria and elsewhere, it is known in Hausa as “Sanya” or “Uwar magunguna” the latter meaning ‘the mother of all medicines.’ This appellation is not unconnected with the fact that it has diverse traditional medicinal uses among various ethnic groups in Nigeria. One of the greatest uses is as a local aphrodisiac (Blackwell, 2010)

An aphrodisiac is a substance that is believed to increase sexual desire. It may be a food, drug, scent supplement or device that can help improve libido. The name aphrodisiac comes from the name of the Greek goddess of love and sensuality, ‘Aphrodite.’ Throughout history, many foods, drinks, and forms of behaviour have had a reputation for facilitating sex and making it more pleasurable (Boyle, 2010) However, from a scientific and historical viewpoint, the alleged results may have been largely due to mere belief by their users that they would be effective (placebo effect). Modern Science is yet to prove any claim that any particular food increases sexual desire or performance (Ngueyem, Brusotti, Caccialanza and Vita, 2009) But aphrodisiacs are generally known to help boost the Sexual Health of a society; Sexual Health being an essential aspect of the development of the psycho-social stability of the individual and the society or nation at large. This is presumably the reason why every culture in the world (past or present) devotes some part of its folklore to sexual matters (Sofowora, 2006) Thus, the crude drug of S. longepedunculata can be used to arrest the problem of Erectile Dysfunction (E.D.) in men. Erectile dysfunction (E.D.) is the inability to attain and maintain penile erection sufficient for satisfactory sexual performance. Decoctions of stem and root bark as well as whole roots are usually taken in order to arrest the problem of E.D. (Aliyu and Alkali, 2006) Dapar et al (2007) observed that the crude drug is relatively non-toxic but expressed their concern over its widespread consumption by humans.

Materials and method
The local plant source of aphrodisiac (i.e. *Securidaca longepedunculata* Fres.) was collected from Dajin Doka, west of Kankia town, Kankia Local Government area of Katsina state with the help of local herbalists and other local people acquainted with traditional medicinal plants. The collected plant was taxonomically authenticated at the Department of Plant Science, Bayero University Kano: *Securidaca longepedunculata* Fres. Voucher or Acc. No.22/plant No. 12. Common English names of the plant include: Violet tree: Rhode’s violet or Wild wisteria. Vernacular (Hausa) name: “Sanya” or “Uwar magunguna.” Family : Polygalaceae TBS (2011)The sources or parts used were the whole roots. The sample was air-dried and ground into pulp/powder before preparing the aqueous extracts and subsequently the doses for administration. Aqueous extract was prepared by soaking 100g of the dried powdered sample in 200 cm$^3$ of distilled water for 12 hours. The extract was then filtered using Whatman No. 42 (125 mm) filter paper folded into funnels on separate conical flasks, thereby removing solids and cellular materials.

Twenty healthy male and female white or albino rats (Rattus norvegicus) weighing 130-140 g were used for the aphrodisiac and acute toxicity tests simultaneously. They were kept in well ventilated cages and allowed to acclimatize with the conditions; ambient temperature, photoperiod and humidity as well as free access to rat pellets and water. They were put into two groups of ten rats each. For the first group, doses of the extract were administered orally (using special syringes) based on the procedure of Lorke i.e. 10 mg/kg, 100 mg/kg and 1,000 mg/Kg body weight(Ibrahim, Mahmoud, Yaro and Ahmad, 2006) A second group of ten rats was used as control, i.e. only given feed and water. This is the first phase of administration which was survived by the rats (no death occurred) allowing for the second phase of doses i.e. 1,600 mg/kg; 2,900 mg/kg and 5,000 mg/kg. The correct volume (cm$^3$) of extract corresponding to each dose was calculated as ‘the product of the average weight of rat (g/kg) and the ratio between the known dose (mg/kg) and the concentration of the extract (g/cm$^3$),i.e. V (cm$^3$) = Average wt. of rat (g/kg) x dose (mg/kg) / concentration of extract (g/cm$^3$). The Median Lethal Dose or LD$_{50}$ (i.e. the dose required to kill half the members of a tested population after a specified test duration) was determined mathematically as the Geometric mean of the Minimum dose with full mortality and the Maximum dose without mortality; LD$_{50}$=[Min.Dose(f.m.) x Max.Dose(w.m.)]$^{1/2}$. After the administration of each dose, the animals were observed for three hours in order to determine the aphrodisiac property via Penile Erection Index (PEI). PEI is defined as the product of Mean episodes of sucking and mounting and Percentage rats showing at least one episode (El-Thaher, 2001)PEI = (Mean episodes of sucking and mounting) x (% Rats showing at least 1 episode).

**Results**

Table 1: PEI values per dose of *S. longepedunculata* root extract in two test regimes orally administered to albino rats for seven days.

<table>
<thead>
<tr>
<th>Test Regime</th>
<th>Dose (mg/kg)</th>
<th>PEI Values</th>
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<tr>
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<td>* 1 2 3 4 5 6 7 Mean</td>
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<td>First Phase</td>
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Table 1 shows the Penile Erection Index (PEI) values per dose, which were used to plot the Dose-Response curve in Figure 1.

**Discussion**

Result from the Penile Erection PEI (Table 1) indicates possible aphrodisiac property, i.e. increased sensitivity and even aggressive sexual behaviour in the rats; shown by the frequent prodding, sucking and mounting of the males on the females. The Mean PEI values for the first and second doses (24, 224, 360, 400, 460, 500) are pretty high compared to the PEI standard of 22. This efficacy is most likely due to a synergism between its constituent active ingredients (some or all of) which were found to include terpenoids, alkaloids, cardiac glycosides, steroid glycosides, saponins and flavonoids (Birdi, Brijesh and Daswani, 2008). Synergism is also responsible for the relative non-toxicity of *S. longopedunculata* which is presumably the reason why local people widely consume its infusions and decoctions for treating various ailments. The vernacular or Hausa name “Uwar magunguna,” meaning the “Mother of all medicines” is a depiction of its diverse use in treating various ailments. But its relative non-toxicity may be due to the combined effect of the active ingredients; causing a decrease in potential toxicity of each individual active ingredient (Nworgu, Owolabi and Atomah, 2010).

**Conclusion**

This study places credence on the traditional folk use of *S. longopedunculata* as an aphrodisiac to arrest erectile dysfunction in men, even though it is also used in the treatment of diverse ailments in people. Although it is relatively non-toxic, its efficacy as a traditional aphrodisiac has been shown by the very high penile erection index in the rat model.

**Recommendation**

Further studies are required to find out whether the roots, stem and leaves of the plant are therapeutically safe and have aphrodisiac property. Other study may be possibly extended to humans albeit with extreme care. Qualitative analysis of the local drug should be extended in order to identify the properties of its constituent bioactive ingredients, both singularly and synergistically. The mechanism of the aphrodisiac property may also be explained in the light of modern anti-ED drugs such as sildenafil citrate (Viagra).

**References**

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stem in albino rats. 22nd National Conference of NISLT, Abuja, Nigeria.


