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IDENTIFICATION OF APHRODISIAC, ANTI OXIDANT ACTIVITY IN ANGEL BRUGMANSIA ROOT AQUEOUS EXTRACT.

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Abstract:
Brugmansi**a** is a genus of seven species of flowering plants in the family Solanaceae. Brugmansia have also traditionally been used in many South American indigenous cultures in medical preparations and as a ritualistic challucinogen for divination, to communicate with ancestors, as a poison in sorcery and black magic, and for prophecy. Medicinally, they have mostly been used externally as part of a poultice, tincture, ointment, or where the leaves are directly applied transversally to the skin. In order to identification of medicinal activity we performed aphrodisiac activity and anti oxidation activity invivo condition. From this study we conformed that the root aqueous extraction has Aphrodisiac, Anti Oxidant activities.
Keywords: Brugmansi**a**. Aqueous extract, Aphrodisiac activity, Anti Oxidant activity.

Introduction:

Brugmansi**a** is a genus of seven species of flowering plants in the family Solanaceae. Their large, fragrant flowers give them their common name of angel's trumpets, a name sometimes used for the closely related genus Datura. Brugmansia are woody trees or shrubs, with pendulous, not erect, flowers, that have no spines on their fruit. Datura species are herbaceous bushes with erect (not pendulous) flowers, and most have spines on their fruit. Brugmansia are large shrubs or small trees, with semi-woody, often many-branched trunks. They can reach heights of 3–11 m (10–36 ft). The leaves are alternately arranged along the stems, generally large, 10–30 cm (4–12 in) long and 4–18 cm (2–7 in) across, with an entire or coarsely toothed margin, and are often covered with fine hairs. The name "angel's trumpet" refers to the large, pendulous, trumpet-shaped flowers, 14–50 cm (6–20 in) long and 10–35 cm (4–14 in) across at the opening. They come in shades of white, yellow, pink, orange, green, or red. Most have a strong, pleasing fragrance that is most noticeable in the evening. Flowers may be single, double, or more. Linnaeus first classified these plants as part of Datura with his 1753 description of Datura arborea. Then in 1805, C. H. Persoon transferred them into a separate genus, Brugmansia, named for Dutch naturalist Sebald Justinus Brugmans.[For another 168 years, various authors placed them back and forth between the genera of Brugmansia and Datura, until in 1973, with his detailed comparison of morphological differences, T.E. Lockwood settled them as separate genera, where they have stayed unchallenged since. Currently, there are 7 recognized species:

1. Brugmansia arborea (L.) Sweet (Andes - Ecuador to northern Chile)
2. Brugmansia aurea Lagerh. (Andes - Venezuela to Ecuador)
3. Brugmansia insignis (Barb.Rodr.) Lockwood ex R.E. R.E.Schult. (Eastern Andes foothills - Colombia to Bolivia and occasionally Brazil)
4. Brugmansia sanguinea (Ruiz & Pav.) D.Don (Andes - Colombia to northern Chile)
5. Brugmansia suaveolens (Willd.) Sweet (Southeast Brazil)
6. Brugmansia versicolor Lagerh. (Ecuador)
7. Brugmansia vulcanicola (A.S.Barclay) R.E.Schult.. (Andes - Colombia to Ecuador)

These species are then divided into two natural, genetically isolated groups.Brugmansia section Brugmansia (the warm-growing group) includes the species aurea, insignis, sauveolens, and versicolor. Brugmansia section Sphaerocarpium (the cold group) includes the species arborea, sanguinea, and vulcanicola.

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Two of these species were challenged by Lockwood in his 1973 doctoral thesis. First, Brugmansia vulcanicola was said to be a subspecies of B. sanguinea, but this was refuted by Lockwood's former mentor, R. E. Schultes in 1977. Second, Lockwood proposed that the species B. insignis was instead a hybrid of the combination (B. suaveolens x B. versicolor) x B. suaveolens. This was later disproved by crossbreeding experiments done by the Preissels, published in 1997. In modern medicine, important alkaloids such as scopolomine, hyoscyamine, and atropine, found in Brugmansia and other related members of Solanaceae, have proven medical value for their spasmolytic, anti-asthmatic, anticholinergic, narcotic and anestheticproperties, although many of these alkaloids, or their equivalents, are now artificially synthesized.

Brugmansia have also traditionally been used in many South American indigenous cultures in medical preparations and as a ritualistic challucinogen for divination, to communicate with ancestors, as a poison in sorcery and black magic, and for prophecy. Medicinally, they have mostly been used externally as part of a poultice, tincture, ointment, or where the leaves are directly applied transversally to the skin. External uses include the treating of aches and pains, dermatitis, orchitis, arthritis, rheumatism, headaches, infections, and as an anti-inflammatory. They have been used internally much more rarely due to the inherent danger of ingestion. Internal uses, in highly diluted preparations, and often as a portion of a larger mix, include treatments for stomach and muscle ailments, as a decongestant, to induce vomiting, to expel worms and parasites, and as a sedative. In a concentrated or refined form, derivatives of Brugmansia are also used for murder, seduction, and robbery. Several South American cultures have used Brugmansia as a treatment for unruly children, that they might be admonished directly by their ancestors in the spirit world, and thereby become more compliant. Mixed with maize beer and tobacco leaves, it has been used to drug wives and slaves before they were buried alive with their dead lord

Name:	**Brugmansia**
Tribe:	Datureae
Family	: Solanaceae
Subfamily:	Solanaceae

Table:1 Brugmansia

Materials and Methods:

The Brugmansia roots were collected from FRI,Dehradun. The required solvents and chemicals are purchased from Hi-Chem Laboratories, Hyderabad.

Extraction details.

Plant roots are dried in under shade up to 2 weeks and powdered (not a fine powder. Chemical constituents extracted in various solvents i.e Hexane, Ethyl acetate, water, Methanol. 280 grms of root powder extracted with soxlate apparatus. The extraction was continued up to 72 hours.To idetnfy the chemical constituents in target plant phytochemical screening was performed by using standard protocol.[6]

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COMPOUND	HEXANE EXTRACTION	ETHYL ACETATE EXTRACTION	WATER EXTRACTION	METHANOL EXTRACTION
Amount of yield	16 grms	10 grms	24 grms	37 grms
% of yield	5.71	3.57	8.57	13.21
Steroids	+	+	+	+
Terpenoids	+	+	-	+
Flavonoids	+	-	+	+
Alkaloids	+	-	+	+
Phenolic compounds	-	-	-	-
Carrotinoids	+	-	+	+
Saponins	-	+	+	+
Tanis	-	-	+	-
Anthra quinines	-	-	+	-
cardiac glucosides:	+	-	-	+

Table.2 Results of Phytochemical screening

1.Acute toxic study:[7]

Acute toxic study was conducted to determine the toxic levels of root extract. 36 Wister strain albino male rats are selected for this study with 250 grms weight approximately. 36 animals divided into 6 groups. Each group having 6 animals. The animals were housed for at least 2 days before experimentation in a temperature- and light-controlled animal care unit, and they were allowed food and water and libitum until 2 h before experimentation. root extract given to know acute toxic dosage in rats. Approximately 2 h before experimentation, the animals were fasted, but allowed free access to water. 5, 25, 50,100,200 mg/kg dose of a water root extract (1-5 groups), Challenge of the animals with the nerve agents was performed inside an approved fume hood and with appropriate protection as per the routine for handling. A gauze pad soaked with 5% sodium hypochlorite was used to detoxify the site of injection.

Each animal received only one injection of root extraction. After challenge with the root extraction, animals were placed in individual cages, allowed to eat and drink, and maintained in the laboratory, which was temperature- and light-controlled. Animals were examined repeatedly during the first 6-h period after injection. Probit analysis was used to derive values for the median lethal doses (LD_{50}values)

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and their 95% confidence intervals as well as the slope of the dose-response relationships**.** From table.3 acute toxic studies the standard concentration of Root extraction was fixed at 25 mg/kg.

Dose effect on Animals:

Methanol Plant extraction	Dosage mg/kg	No of survival animals	% of survival animals
Group-1	Control- Zero dosage	6	100
Group-2	5	6	100
Group-3	25	6	100
Group-4	50	5	83.33
Group-5	100	3	50
Group-6	200	0	0

Table.3 Results of acute toxic studies

2. Aphrodisiac activity: Aphrodisiac activity test was performed by using standard protocol [8]

Required Apparatus:

1. Agilent 1100
2. Vacuum degasser,
3. Quaternary pump,
4. Auto sampler,
5. Thermos tatted column ,Compartment,
6. Diode array detector.

HPLC conditions:

1. Column:150 x 4.6 mm, 3 µm**,** Water C18
2. Mobile phase: A = water, B = CH3OH, C= CH3CN
3. Column Temp:40 ºC
4. Injection vol.:25 µl
5. Detector: diode-array detector
6. Wavelength: 245 nm

Sample preparation[9]

Collected blood into anticoagulant-treated tubes EDTA-treated (lavender tops). Cells are removed from plasma by centrifugation for 10 minutes at 1,000-2,000 x g using a refrigerated centrifuge. Centrifugation for 15 minutes at 2,000 x g depletes platelets in the plasma sample.The resulting supernatant is designated plasma. Following centrifugation, it is imported into a clean polypropylene tube using a Pasteur pipette. The samples maintained at 2-8°C. The resultant plasma was dilute in mobile phase and injected in to HPLC. Chromatograms were recorded. Sildenafil citrate 100mg was taken as standard for Aphrodisiac activity**.** 18 Animals were taken for this study. Testosterone levels were estimated in blood.

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S.NO	Standard Testosterone (ng/dL)	Peak Area
1	1	2065
2	2	4327
3	3	6245
4	4	8426
5	5	10457
6	6	12309
7	Slope = 2064.643	Intercept = 67.35714

Table.4 Linearity of Standard Testosterone

Grop-1	No of Animal	Testosterone ng/dL
(Group-1) Control	1	1.12
	2	1.37
	3	1.23
	4	1.15
	5	1.12
	6	1.05
(Grop-2) Water extract	1	3.62
	2	4.24
	3	3.38
	4	3.99
	5	3.57
	6	3.12
(Grop-3) Standard	1	5.64
	2	5.53
	3	5.21
	4	5.06
	5	5.89
	6	5.71

Table.5 Quantification results of Testosterone levels

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1	**SODIUM**	**112 m mol/L**	**±0.29**
2	UREA	3.09 m.mol/L	±1.63
3	CREATININE	71 µ.mol/L	± 0.54
4	GLUCOSE	84 mg/Dl	±0.83
5	POTASSIUM	4.75 m.mol/L	±0.26
6	W.B.C	2.39×10^9	±1.35
7	R.B.C	3.19Million / µL	±1.44
8	PLASMA	4.72%	±1.86
9	P^H	6.69	±1.74
10	HEMATOCRIT	19.82%	± 1.39

Table.6 Regular parameters of blood sample

3. Anti oxidant activity:

24 rats were selected for identification of anti oxidant activity of Angel Brugmansia aqueous extract. Hepatopathy was induced in animals by administration of CCl4 interperitoneally (at the dose of50 50mg/ml,i.p, in liquid paraffin for 14 days .The rats were equally divided into 4 groups, each group contains six animals. Group-I was considered as control, Group-II was considered as CCl4 (1.25 ml/kg,i.p,/14 days) treated animals, Group-III was considered as CCl4 and aqueous extract (25mg/kg,p.o/14 days) treated animals, Group-IV was considered as CCl4 and silymarin (25 mg/kg, p.o/14 days) treated animals. Blood samples were collected by direct cardiac puncture and serum was used for the assay of marker enzymes and other parameters, Liver was dissected out and immediately preserved in 10% formaldehyde solution for Histo pathological study.

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Group	Dose	TRIGLYCERIDES (mg/dL)	Cholesterol (mg/Dl)	Total protein (g/DL)	Total Bilirubin (mg/Dl)	S.G.O.T (IU/L)	SGPT (IU/L)	Alkaline phosphate (KA Units)
1	Control	149.3±0.52	128.5±0.93	7.29±1.25	0.45±1.57	37.25±0.54	36.2±0.38	7.25±0.66
2	CCl4	260.2±0.64	248.4±0.21	4.94±0.48	1.86±1.63	112.5±0.61	87.5±0.19	26.37±0.31
3	CCl4+aqueous extract	164.3±0.84	220.1±0.86	5.93±0.37	1.09±1.21	61.28±0.38	40.75±0.31	12.15±0.30
4	CCl4+Silymarin	155.2±0.57	134.6±0.33	7.53±0.66	0.53±1.64	40.96±0.55	39.35±0.29	9.13±0.51

Table.7 Results of Anti oxidant activity Bio-chemical tests

Discussion on Results:

From the Table.2 Water extract has maximum natural products except Phenolic compounds, cardiac Glucosides, Terpenoids. In this study we are selected water extract for identification of Aphrodisiac, Anti Oxidant activity in aqueous root extract. From literature already it proved that, the plant ANGEL BRUGMANSIA has some dermatological activity. From Table.3 the standard concentration was selected as 25 mg/kg. In table.5 the water extract taken group-2 animals showing better results of Testosterone levels in blood than control group. But these results are poor than standard group animal results. The anti oxidant activity was confirmed by the comparison with silymarin. From Table.7 Group -3 animals showing better results than group 1 and Group 2. From this study we conformed that the root of Angel Brugmansia has Aphrodisiac, Anti Oxidant activity.

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