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Anti-inflammatory activities of Boerhavia diffusa roots in Albino rats

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The anti-inflammatory activity of the petroleum ether, Choloform, acetone, alcoholic, aqueous extract of the roots of Boerhavia diffusa in Albino rats was studied in the presence of Sterols, Triterpenes in Petroluem ether extracts, Triterpenes, Sterols, Alkaloids in Choloroform extracts, Sterols, Triterpenes Alkaloids, Flavonoids, in acetone extracts, Alkaloids, Flavonoids, Tannins in Alcoholic extracts, Alkaloids, Flavonoids, Tannins in aqueous extract. Boerhavia diffusa roots exhibited significant anti-inflammatrory activity in Albino rats, the exact doses were compared with Phenyl Butazone as standards & were found out the extracts revealed the satisfactory significance activity.

Keyword's : Boerhavia diffusa, Anti-inflammatory.

INTRODUCTION : Boerhavia diffusa, family, nyctaginaceac is commonly known as Punarnava is a genus of Herb distributed throughout the plains of India & Brazil as Red & Dark variety, expecially during rainy season, also habituated abundantly as a weed throughout India upto an altitude of 2,000 meters in the Himalayas and also cultivated to some extent in West Bengal, the roots contain alkaloids (0.05%), triacontanol, hentriacoutane, punarnavan, steroids-Alpha-Sitosterol, β-Sitosterol, Palmitic acid, Ursolic acid, 5, 7-dihydroxy-3,4-dimethyoxy-6, 8-dimehyl flavone, & an unidentified ketone (Melting point – 86^0 C),

Minerals-potossium nitrate (Dental plaque), sodium sulphate & chloride.

The roots also contain the rotenoid boeravinones, Al, Bl, C_2, D, E&F, besides the new dihydro iso furenoxanthin, borhavine & an anti-fibrinolytic agent, punarnavoside, two lignans, liriodendrin & syringa resinol mono-β-D-glucoside, have been reported in the roots.

Pharmologolical actions : Laxative, anti-inflammatory, anti-bacterial & anti-viral.

Therapeutic uses : Hepato-protective (Jaundice), Teratogenic, Anti fibrinolytic activity, lipid lowering levels in serum & tissues, Diuretic effects, Tumour pathology, Asthma, Anaemia, Scanty urine, Heart disease, Internal inflammation, Cough, Bronchitis. The Herb Boerhavia diffusa selected for the present study is to investigate the petroleum ether extracts of roots for its anti-inflammatory activity.

Materials & Methods :

a) Plant material collection & preparation of extracts: The root of boerhavia diffusa were obtained from Amrut Kesari depot, Bangalore. They were subjected to comminution & the powdered drug was individually extracted using following solvents

a) Petroleum ether b) Choloform, c) Alcohol 90%, d) Acetone e) Water,

About 100 gms of the powdered drug was packed in a thimble & extracted in a soxhlet extractor using 500 ml petroleum ether (60-80^0 C) for 16-20 hours. At the end of extractions, the extract were filtered & distilled to concentrate. The residue was dried under vacuum for 24 hours & the yield was recorded. The resulting residue was dried & the yield was recorded. The marc left over after the extraction with chloroform was air dried & again subjected to soxhlet extraction using 500 ml of alcohol 90%, acetone, Aqeous, after 20 hours of extraction, the percentage yield of the different solvent extracts & physical characters like state, colour, odour, texture, pH & percentage yield were studied & recorded in table No.1.

b) Experimental Animal: Wistar Albino rat weighing 150-200 gms were selected for the present study. Animals were fed with standard pellets diet (Mysore feeds). Rats were kept in environmentally controlled rooms (25 ^{0} C + / - 2 ^{0} C) 12 hours, light & dark cycle. Subsequently, 10.00 & 14.00 hours for 1 week before & during experiments. Animals were divided in different experimental animal groups five rats were used for each groups. Experimental protocols were approved by institutional animal ethical committee (IAEC). Before performing the experiments.

Drugs & its preparation :

Phenyl butazone (united States pharmacopia) volume xx page Nos.617 & 618. Carrogeenan (Sigma Mumbai) were used in the study of Boerhavia diffusa. Carragenan preparation : 1% carragenan in 0.9 % sodium chloride, phenyl butazone preparation. Boerhavia diffusa extract in 5% gum Acacia before oral administration.

Figure two statistical monograms

Phytochemical test : The freshly prepared ethanolic extract, petroleum extract, acetone extract, choloroform extract, aqeous extract of Boerhavia diffusa was subjected to standard phytochemical screening tests for various constitutents, the extract revealed the presence of sterols, flavonoids, alkaloids, tannins, triterpenes

Anti-inflammatory activity :

Carragenan induced Rat Paw Edema: In this method, wistar albino rats were divided in 5 groups consists of five rats. The animals were pretreated with drugs 60 minutes before carrageenan (0.1 ml of 1%) injection. Carrageenan was injected into the sub plantar tissue of left hind paw of each rat. Swelling of carrageenan injected foot were measured at 0, 1, 2, 3 hours, 6 hours, 12 hours, & 24 hours using plethysmometer (UGO basile, Italy) the right hind paw was injected with 0.1 ml of vehicle. The standard drug was prepared in 5% gum acacia suspension.

Group 1 : The animals were received 5% gum acacia suspension prepared in distilled water served as Control. Group 2: The animals were

Table No.1:Physical characters of the Individual extract from **boerhavia diffusa**

Sl. No.	Parameters	Boerhavia diffusa				
		Petroleum ether extract	Chloroform extract	Acetone extract	Alcoholic extract	Aqueous extracts
01.	Percentage	0.6522	0.3509	1.2525	2.4732	10.9858
02.	State	Semi Solid	Solid	Solid	Semi Solid	Semi Solid
03.	Colour	Light Brown	Mid buff brown	Mid buff brown	Mongolia brown	Mid buff brown
04.	Odour	Rancid	Characteristic	Rancid Aromatic	Aromatic	Blend
05.	Taste	Slightly bitter astringent	Slightly bitter & mucilaginous	Bitter astringent	Aromatic bitter	Astringent salty
06.	Texture	Smooth	Sticky	Sticky	Smooth	Smooth fluid
07.	pH	4.5	6.5	4.0	3.8	3.5

received the standard drug phenyl butazone 150 mg / kg. served as a reference standard.Group 3 : Treated with Petroleum ether extract of Boerhavia diffusa (0.0279 gms / kg.P.O) Group 4 : Treated with Choloform extract of Boerhavia diffusa (0.0282 gms / kg.P.O) Group 5 : Treated with Acetone extract of Boerhavia diffusa (0.1399 gms / kg.P.O) Group 6 : Treated with Alcoholic extract of Boerhavia diffusa (0.0454gms / kg.P.O) Group 7 : Treated with Aqueous extract of Boerhavia diffusa (0.1348 gms / kg.P.O)

Statistical Analysis :

All the data were expressed as mean + / - SEM Statistical analysis were performed using one-way analysis of variance (ANOVA) followed by Dunnett's test. * P< 0.05 was considered statistically significant.

RESULTS & DISCUSSION

Phytochemical tests:

The freshly prepared Petroleum ether extracts, chloroform extract, acetone extract, Alcoholic extract, Aqeous extract, of Boerhavia diffusa were subjected to standard phyto chemical screening tests for various constituents the extract revealed the presence of sterols, triterpenes, alkaloids, flavanoids, tannins respectively.

In an attempt to evaluate some of the important secondary cell constituents of Boerhavia diffusa for Anti-inflammatory activity. The Alkaloids & steroids were isolated by standard extraction procedure and also carried out the TLC studies in order to establish TLC profile.

The Anti-inflammatory activity of these constituents were studied by inducing 0.1 ml of 1% carragennin to rat hind paw where in which Alkaloids & steroids showed significant activity when compared with standard phenyl butazone.

The spectral studies for the isolated steroid obtained from fraction No.15 were carried out

& spectral peaks obtained were closely matched with the structure & functional groups of the β-Sitosterol of Boerhavia diffusa. These isolated components with Choloform : Acetone (9:1) were evaluated for anti-inflammatory activity by the method inducing 0.1 ml of 1% carragennin to rat hind paw. The results indicated the possession of maximum degree of anti-inflammatory activity in fraction No. 15 with 61.29% inhibition of oedema.

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