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Short Communication

Evaluation of the Anti-Edematogenic Activity of the Aqueous Extract of *Leea guineensis*

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Abstract. The aqueous extract of *Leea guineensis* leaves was evaluated for its anti-edematogenic properties.The phytochemical studies revealed the presence of saponins and glycosides as the secondary metabolites.Using the carrageenan-induced paw oedema, there was a significant ($P<0.001$) reduction in edema. The study also revealed a dose dependent anti-edematogenic activity.

Keywords: carrageenan, *Leea guineensis*, anti-edematogenic activity

Leea guineensis is an evergreen shrub belonging to the family Ampelidaceae. Present studies were carried out to investigate the anti-edematogenic effects of this plant.

The plant was collected from Iguosa village in Ovia North East Local Government of Edo State around the month of August, 2005. The fresh leaves of plant were air dried for a period of two weeks, then were ground to a fine powder with the aid of a mechanical grinder. 250 g of the powdered sample was then macerated for 48 h using distilled water at 25 °C. The cold extract was concentrated to dryness with a rotary evaporator at reduced pressure and stored in a refrigerator at -4 °C. Fresh dilutions were prepared each day for the experiments.

Phytochemical screening. The freshly prepared aqueous extract was subjected to chemical analysis for the presence of alkaloids, saponins, flavonoids, reducing agents, tannins and terpenes. The methods of Trease and Evans (1989) and Harbone (1973) were used. Results are shown in Table-1.

Pharmacological evaluation. Wistar rats (150-180 g) of either sex kept at the animal house of the Department of Pharmacology and Toxicology, Faculty of Pharmacy, University of Benin, Benin City, Nigeria, were used for pharmacological evaluation. The animals were maintained under standard environmental conditions and had free access to standard diet and water.

Determination of the LD_{50} of the aqueous extract. The method of Lorke (1983) was employed. Twenty mice (20-22 g) of either sex taken and were randomly divided into 5 groups of 4 mice each. Prior to testing, the animals were fed with mice pellets and had free access to drinking water but starved for 12 h before testing. The first four groups were orally administered with 1, 2, 3 and 5 g/kg of the extract. General symptoms of toxicity and mortality were first observed for 24 h after which the animals were left for further 14 days for any delayed toxicity.

Anti-edematogenic activity. Carrageenan-induced rat paw oedema is used widely as a working model of inflammation in the search for new anti-edematogenic drug (Manueli *et al.*, 1994) and appeared to be the basis of the discovery of indomethacin, anti-inflammatory drug (Winter *et al.*, 1963). The *in vivo* anti-edematogenic activity was measured using carrageenan-induced rat paw oedema assay (Adeyemi *et al.*, 2002; Winter *et al.*, 1962). Groups of 6 rats of both sexes (pregnant females excluded) were given a dose of the extract. After an hour 0.1 ml of 1% carageenan suspension in 0.9 % NaCl solution was injected into the sub-plantar tissue of the right hind paw. The linear paw circumference was measured at hourly interval for 4 h (Bamgbose and Noamesi, 1981). Two groups of drug treated rats and one control group were used each test day. The mean paw oedema value for the test group being compared with its mean value for the control group for that day.

Table 1. Phytochemical compositions of the aqueous extract of *Leea guineensis*

Chemical constituents	aqueous extract
Alkaloids	+
Saponins	+
Flavonoids	-
Tannins	-
Reducing sugars	+
Anthraquinone glycosides	-

+ = presence of component; - = absence of component

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Table 2. Anti-edematogenic activity of the aqueous extract of the leaves of *Leea guineensis*

Drugs	Oral doses (mg/kg)	Change in paw oedema mean ± sem (mm)	% Oedema inhibition relative to control at the 4th h
Control 5% Tween 80	0.3 ml	2.75 ± 1.35	-
Indomethacin	10	1.52 ± 0.29	46
Aqueous extract	100	2.60 ± 0.57	6
	200	1.25 ± 1.45*	56
	400	0.75 ± 1.47**	73

values are mean ± sem *= $P < 0.05$; ** = $P < 0.001$, significantly different from control, paired t-test (n = 6).

Anti-edematogenic activity (Amir and Kumar, 2005) was measured as the percentage reduction in oedema level when drug was present, related to control as shown in Table 2. Activity = 100 - (100 × (average drug treated /average for control).

Indomethacin (10 mg/kg) was administered orally as reference drug while 5 % Tween 80 was used as negative control.

All data were expressed as mean ± SEM; the student's t-test was applied to determine the significance of the difference between the control group and the test extracts.

The extracts were screened at three different dose ranges to ascertain the dose-dependent level. From the results obtained, the dose at 400 mg/kg caused 73 % inhibition of the oedema level, which was the highest activity even greater than the reference drug, the dose at 200 mg/kg also showed significant anti-edematogenic activity ($P < 0.05$).

The anti- edematogenic activities of most medicinal herbs have been closely related to the high content of triterpenoids saponins (Ammar *et al.*, 1997). Probably the presence of copious amount of saponins in *Leea guineensis* leaves was responsible for the activity.

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