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***Moringa oleifera* leaves extract has same anti-inflammatory potentials as nonsteroidal anti-inflammatory drugs (ibuprofen)**

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Abstract

Anti-inflammatory potentials of *oringa oleifera* leaves extract were studied in thirty (30) fresh egg albumin induced inflammation male and female albino rats. The liner circumference of the injected paw was measured before and after the administration of the fresh egg albumin. The animals were divided into five (5) groups with six animals in each group. Group was control given distilled water, group was administered with ibuprofen while group 3 – 5 were given dosages of aqueous extract of *oringa oleifera* per body weight. There was significant reduction ($p < 0.05$) in the paw circumference of the rats in group 3 – 5 treated with the leaves extract as compared with control and animals in ibuprofen group. It observed extract of oringa oleifera has similar anti-inflammatory potentials as ibuprofen.

Keywords: Moringa leaves extract, anti-inflammatory potentials, Ibuprofen

1. Introduction

Inflammation is a pathological and a protective process involving cells and histologic reactions which occurs in the blood vessel and surrounding tissues of man in response to injury or abnormal stimulation due to physical, chemical or biological agent or both. The signs of inflammation are redness of the skin, swelling, pains, etc [1, 2].

The purpose of in Fla is to eliminate the cause of injury, rid the body of debris of cells breakdown or necrosis and then initiate tissue repair [3, 4]. Inflammation is classified as Acute or chronic. Acute inflation is the initial response of the body to harmful stimuli this is characterized by the infiltration of white blood cell e.g. granulocytes, swellings, redness [5] (and last for short period [6]. On the other hand chronic inflammation is the prolonged inflammation characterized by the destruction and healing of the tissue from the inflammatory process. The redness is due to increased blood flow while swelling is as a result of accumulation of fluid and pain is due to the release of bradykinin and histamine that stimulate nerve endings [7].

Inflammation is often mainly associated with infection as in parasite infestation and increase in eosinophil population; leucocytosis and esinophilia [8], Inflammation and its signs are therefore very sensitive in, *in vivo* indicator of cells reaction particularly the immuno complex involvement. However, the health implications of inflammation are enormous especially pains and swellings (oedema) and the complications associated with the therapy of gastric ulcer and non-steroidal anti-inflammatory drugs (NSAIDS) [9, 10]. It is these complications from the therapy that led to this study of using oringa oleifera as potnt anti-inflammatory herbal remedy for the treatment of inflammation and this research study shall provide an alternative therapy in inflammatory reactions and likely to explain the underlying triggering factors.

2. Materials and Methods

Thirty (30) male and female albino rats and twenty four [11], male and female albino mice were used for the study. The animals were maintained in a well-ventilated university of Uyo, Department of harmacology animal house. They were fed with pellets ad clean water. The animals were cared for according to the regulation of institute of animal ethical committee (IAEC) and the ethical standard laid down in 1964 declaration of Helsinki were observe The mice were used for acute toxicity test while the rat were used for main experiment.

2.1 Collection of the Plant: *Moringa oleifera* fresh leaves were obtained from the University of Uyo farm. The leaves were identified by a botanist in the Department of Botany, University of Uyo.

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2.2 Preparation of Extract

120g of oringa oleifera were chopped into pieces and pounded using mortar and pestle. 1 litre of water was added to obtain the liquid filtrate. The filtrate was concentrated to dryness in a vacuo at 40°C and was weighed, 43.91g.

2.3 Acute Toxicity Test (LD50)

The acute toxicity test was done according to methods of [12]. Twenty four mice were divided into 6 groups of 4 mice per group. Each of the mice in the group were induced with inflammation using egg albumin. The moringa oleifera aqueous extract were administered as follows, 100mg/kg, 1500mg/kg, 1800mg/kg, 2000mg/kg, 2500mg/kg and 3000mg/kg. They were observed of the signs of toxicity 24 hours after the administration.

The acute toxicity was calculated as follows:

$$\begin{aligned} \text{Maximum dosage that produced 0\% Mortality} &= 1500\text{mg/kg} \\ \text{Minimum dosage that produced 100\% mortality} &= 3000\text{mg/kg} \\ \text{LD50} &= \frac{1500 \times 3000}{2} \\ &= 2121.32\text{mg/kg} \\ &= 21.2\text{mg/kg} \end{aligned}$$

3. Results

Table 1: Effect of Aqueous Extract of Moringa Oleifera

Group	Dosage	0Hr(initials)	0.5Hr	1Hrs	2Hrs	3Hrs	4Hrs	5Hrs	Pvalue
R	Control	3.85+0.31	6.45+0.31	6.09+0.29	5.96+0.24	5.80+0.17	5.59+0.25	5.52+0.25	$P < 0.001$
2	Ibuprofen 40mg/kg	3.94+0.14	5.95+0.38	5.45+0.16	5.38+0.12	5.27+0.20	4.48+0.26	4.21+0.59	$P < 0.001$
3	212mg/kg	3.66+0.13	5.92+0.12	5.46+0.17	5.33+0.16	5.15+0.19	4.94+0.13	4.80+0.09	$P < 0.001$
4	424mg/kg	3.60+0.13	5.94+0.69	5.47+0.32	5.33+0.20	5.01+0.2	4.90+0.06	4.68+0.12	$P < 0.001$
5	636mg/kg	3.57+0.07	6.15+0.50	5.64+0.23	5.22+0.26	5.04+0.11	4.90+0.11	4.63+0.19	$P < 0.001$

4. Discussion

The study has shown the efficacy of moringa oleifera as anti-inflammatory remedy, and dose dependent. The inflammation induced by the egg albumin is due to release of histamine [19, 20] serotonin and bradykinin or either by the cells. This is often the first phase and is often followed by the release of prostagandins. The second phase is related to the infiltration of leucocytes e.g. neutrophil and the production of free radical species [21]. The decrease in the paw size of the animals administered with moringa oleifera showed the high potency of the herbal remedy as compared with control. The medium dose of the extract of moringa oleifera showed the highest level of inhibition of inflammation [22]. The highest dose did not produce healthy results, thus plant extract need be used with caution. The pathways in the anti-inflammatory may likely dwell in the inhibition of release of histamine and brady-kinin and other mechanism [23, 24, 25] this may be contributed by the phenols and flavoids contents of moringa oleifera leaves.

This study has shown that the anti-inflammatory properties exhibited by extract of moringa oleifera are in the range with ibuprofen (NSAID). But it is not known if this extract will have adverse effect as other inflammatory drugs. However, its phytochemical constituents of phenols and flavonoids etc are sensitive indicators of this therapy being of more protective than harmful.

5. Recommendation

Moringa oleifera is therefore recommended for clinical use

2.4 Dosage Given to the Rats

10% of 2121.32mg/kg	=	21.2mg/kg
20% of 2121.32mg/kg	=	42.4mg/kg
30% of 2121.32mg/kg	=	63.4mg/kg

2.5 Grouping of the rats

Thirty (30) rats were divided into 6 groups 1 rats 10ml kg of distilled water as control group 2 were given ibuprofen, 40mg/kg, group 3, low dose; 21.2mg/kg 4, medium dose; 42.4mg/kg and group 5, high dose; 63.6mg/kg.

2.6 Inducement of Inflammation in the Rat

The rats were starved for 24 hours before inducement [13, 11]. Fresh egg albumin was injected into the rat via the sub planter tissue of the right hind paw to induce the inflammation [14, 15]. The liner circumference of the injected paw was measured before and after injection.

Extract of the leaves 21.2mg/kg, 42.4mg/kg and 63.6mg/kg and 40mg/kg of ibuprofen were administered orally using oral cannula by passing theinter the [16, 17, 18].

2.7 Assessment in Inflammation

This was assessed as the difference in paw circumference between the control and the experimental group after 5 hours of administration of egg albumin. It was done using digital caliper.

after a full ongoing side effect screening regard structural insight o this plant extract is completed.

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