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Anti-inflammatory Activity with Pharmacological and Sub-chronic Toxicity  
Studies of some Medicinal Plants Extracts

دراسة الخواص المضادة للإلتهاب ، الدراسات الدوائية و السمية لمستخلصات بعض النباتات الطبية

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### **List of Abbreviations :**

ALP	Alkaline phosphatase
ALT	Alanine transaminase
AST	Aspartate transaminase
CEE	Crude ethanolic extract
EVM	Ethnoveterinary medicine
GIT	Gastrointestinal tract
Hb	Haemoglobin
Hrs	Hours
INF-Y	Interferon - Y
IP	Intraperitoneal
K	Potassium
Kg	Kilograms
MAC	Membrane attack complex
MCH	Mean corpuscular haemoglobin
MCHC	Mean corpuscular haemoglobin concentration
MCV	Mean corpuscular volume
mg	milligrams
Na	Sodium
PAMPs	Pathogen associated molecular patterns
PCV	Packed red cell volume
PRRs	Pattern recognition receptors
R.B.C	Red blood cells
S.E.D	Standard error of deviation

TNF- $\alpha$	Tumour necrosis factor - $\alpha$
W.B.C	White blood cells



## Abstract

In the current study experiments were conducted to evaluate the possible anti-inflammatory effects of Crude Ethanolic Extracts CEE of *Aerva javanica* whole plant, *Amaranthus viridis* whole plant and *Lepidium sativum* seeds in rats injected with Carrageenan so as scientifically appraise its ethnomedicinal use and to detect any side effects that may be associated with their use. The ethanolic extract of the three plants were studied on selected isolated tissue preparations and their sub-chronic toxicity studies were evaluated.

In the study, using a dose of 250 mg/kg of ethanolic extracts of the three plants was found to produce reduction or inhibition of the inflammation as 48.3% at 3 hrs for CEE of *Aerva javanica*. The CEE of *Amaranthus viridis* produced inhibition of inflammation as 40.3% at 3 hrs and the CEE of *Lepidium sativum* produced inhibition of inflammation as 38.6% at 3 hrs respectively.

The anti-inflammatory activity of the three plants was also confirmed by using the dose of 500 mg/kg and the inhibition of inflammation was found as 85.2% for the CEE of *Aerva javanica* at 3 hrs. The CEE of *Amaranthus viridis* produced inhibition of inflammation as 70.4% at 3 hrs and the CEE of *Lepidium sativum* produced inhibition of inflammation as 46.0% at 3 hrs.

The effect of CEE of the three plants on smooth muscle of rabbit jejunum were tested. The CEE of *Aerva javanica* whole plant showed contraction of the smooth muscle of rabbit jejunum. The contraction was blocked by atropine (5 µg/ml), antagonistic property. The CEE of *Amaranthus viridis* whole plant and the CEE of *Lepidium sativum* seeds showed a dose dependent (1,2,4 mg/ml) stimulation of the isolated rabbit jejunum preparation, this stimulation was partially blocked by atropine (5 µg/ml), but was blocked by cyproheptadine (40 µg/ml), (a non-selective 5-HT blocker).

In the sub-chronic toxicity study, the result of haematological studies of the three plants, concerning haemoglobin (Hb), packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), red blood cell count (RBCs) and white blood cell count (WBCs) showed no significant change from the control group for the two different doses at the two different periods of time.

The result of the biochemical assays of the three plants , concerning liver function and the kidney function tests , the ethanolic extracts of the three plants showed no significant change from the control group for the two different doses at the two different periods of time .

Histopathological changes of the tissues of liver , kidneys , intestines , spleen and heart showed no histopathological changes were observed in the spleen and heart tissue , but there were congested vacuolated hepatocytes with dilated hepatic blood vessels and dilated liver sinusoids with perilobular and centrilobular hepatocytic necrosis .

The renal tubules were congested and dilated with variations in renal glomeruli size and many lobulated glomeruli tufts with dilated bowman space and focus of macrophage collection .

The intestinal villi and the intestinal mucosal epithelium were desquamated and the lumen contain RBCs and shreads of epithelial cells and WBCs .

## ملخص الاطروحة

إن الادوية التقليدية المستعملة لعلاج الالتهاب و الاعراض المصاحبة ، اما ان تكون غالية الثمن أو سامة أو غير متوفرة مما نتج عنه الالتفات لاستعمال النباتات كبديل للأدوية المستعملة لمعالجة الأمراض . و عليه قد تم في هذا البحث إجراء تجارب عملية لاختبار فعالية المستخلصات الكحولية لنباتات راس الشايب ، لسان الطير كبير و بذور نبات حب الرشاد ضد الالتهاب في المختبر و على فئران التجارب التي تم حقنها بمادة الكاراجينان المحفزة للالتهاب ، و لمعرفة الاثار الجانبية المصاحبة لاستعمال هذه المستخلصات .

في هذه الدراسة تم اختبار المستخلص الكحولي لنباتات راس الشايب ، لسان الطير كبير و بذور حب الرشاد على أنسجه معزولة من أمعاء الارنب كما تمت دراسة و تقييم السمية لهذه المستخلصات .

و قد أوضحت التجارب المختبرية بأن استعمال جرعة 250 ملجرام / مل من المستخلصات الكحولية لنباتات راس الشايب ، لسان الطير كبير و بذور حب الرشاد نتج عنها نزول في مقياس درجة الالتهاب بعد مرور ثلاثة ساعات من المعالجة بالمستخلص الكحولي لنبات راس الشايب 48.3 % و بالمستخلص الكحولي لنبات لسان الطير كبير 40.3 % و بالمستخلص الكحولي لبذور حب الرشاد 38.6 % على التوالي .

و تم تأكيد فعالية مستخلصات النباتات الثلاث في معالجة الالتهاب باستعمال جرعة 500 ملجرام / مل من المستخلصات الكحولية لنباتات راس الشايب ، لسان الطير كبير و بذور حب الرشاد نتج عنها نزول في مقياس درجة الالتهاب بعد مرور ثلاثة ساعات من المعالجة بالمستخلص الكحولي لنبات راس الشايب 85.2 % و بالمستخلص الكحولي لنبات لسان الطير كبير 70.4 % و بالمستخلص الكحولي لبذور حب الرشاد 46.0 % .

في هذه الدراسة تم اختبار المستخلص الكحولي لنباتات راس الشايب ، لسان الطير كبير و بذور حب الرشاد على أنسجه معزولة من أمعاء الارنب . لقد احدث مستخلص نبات راس الشايب انقباضا لامعاء الارنب و هذا الانقباض كان لمادة الاتروبين اثرا انعكاسيا عليه . أما المستخلص الكحولي لنبات لسان الطير كبير و بذور حب الرشاد اظهر تنشيطا متناسبا طرديا مع الجرعة على أمعاء الارنب المعزولة ، هذا الاثر الذي لم يستجب للاتروبين ( استجابة جزئية ) و لكن تم قفله نهائيا بواسطة مضاد السرتونين السبروهيبتادين .

نتائج قياسات السمية للمستخلصات الكحولية لنباتات راس الشايب ، لسان الطير كبير و بذور حب الرشاد لم تظهر اي تغيير ملحوظ لقياس مكونات الدم المختلفة ، القياسات الكيميائية و السمية لاختبارات وظائف الكبد و الكلى .

في هذه الدراسة تمت معرفة تأثير المستخلصات الكحولية لنباتات راس الشايب ، لسان الطير كبير و بذور حب الرشاد على أمراضية انسجة الكبد ، الكلى ، الامعاء ، الطحال و القلب و قد اظهرت النتائج عدم حدوث أي تغييرات على أنسجة الطحال و القلب إلا أن هناك فجوات و تورم بالخلايا الكبدية مع توسع و تضخم الاوعية الدموية بها كما لوحظ توسع في جيبيات الكبد و تغييرات نخرية حول و داخل نسيج الكبد . هناك احتقان و توسع النبيبات الكلوية مع تورم احواض النبيبات كما لوحظ , اختلافات في حجم الكبيبات الكلوية و الكثير من لمات الكبيبات المفصصة مع توسع في فراغات بومان و وجود بؤرة

لتجمع البلاعم . أما بالنسبة لنسيج الامعاء فقد لوحظ توسف الزغابات المعوية و الغشاء المخاطي المعوي , كما لوحظ وجود انحلال دموي به .

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