بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / مني مغربي أحمد

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

Ain Shams University **Faculty of Science**

Antitrypanosomal Activity of Rosemary (*Rosmarinus officinalis*) Plant Extract on *Trypanosoma evansi* Experimental Infection

A thesis submitted for partial fulfillment of the requirements for the degree of M.Sc.

In
Zoology

By
Sara Samy Ibrahim Al Asrag
(BSc: Zoology-Chemistry)

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(2022)

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Biography

Name: Sara Samy Ibrahim Al Asrag.

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- B.Sc. Zoology-Chemistry (2007), Faculty of Science, Ain Shams University.
- Shared in Workshop on DNA Extraction & PCR at the Central Laboratory, Faculty of Science, Ain shams University (2019).
- Passed the Test of English Language Proficiency (TOEFL) with a score = 570 degrees.
- Took a lot of training courses and skills on different scientific instruments as HPLC – Amino acid analyser – GC Mass -Electronic microscope at the Central Laboratory of Desert Research Center, Egypt.
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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانكَ لاَ علِمَ لَنَا إِلاَّ مَا

عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

سورة البقرة آية (٣٢)

I dedicate this work to

my small family, headed by my dear husband Mostafa

and my Young children. Also, I dedicate this work to

my precious Mum and Dad.

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ABSTRACT

Trypanosoma evansi is the most geographically widespread African trypanosome affecting mammals and causes an unlimited severe economic loss in developing countries. The current study aimed to evaluate the *in vitro* and *in vivo* activity of rosemary (*Rosmarinus officinalis*) plant extracts on *T. evansi* experimental infection compared to the standard chemical drug diminazene aceturate. Eight extracts were prepared at concentrations of 4, 10, & 20mg/mL (four from leaves and four from stem bark) of the rosemary plant collected from Matrouh Governorate. Four Solvents: petroleum ether, ethyl acetate, ethyl alcohol, and distilled water, were used in ascending order of increasing polarity. Also, phytoscreening of those extracts and their toxicity were assessed. Besides, *in vitro* and *in vivo* studies evaluated *T. evansi* viability post-treatments and the efficiency of those extracts. Also, the potential haematological, biochemical and histopathological abnormalities associated with the administration of treatments. The results of the phytochemical screening showed significant differences ($p \leq 0.05$) between leaves and stem bark components. Different extracts of concentration 20mg/mL affected the *in vitro* activity of *T. evansi* more than others but less than diminazene aceturate without acute toxicity. Statistical analysis corroborated anti-trypanosomal activity-specifically correlated to treatment based on the solvent type and plant part extracted. *In vivo* results showed a significant reduction in infection-induced alterations in treated groups compared to the untreated healthy group. Some extracts did not achieve complete restoration of some selected biochemical indices to a pre-infection state and confirmed by histopathological sections could not prevent the disease-induced liver damage.

KEY WORDS: *Trypanosoma evansi*, Rosemary extracts, *In vitro*, *In vivo*, Organic solvents, Rats.

CONTENTS

LIST OF ABBREVIATIONS

Abbrev.	Full-term
CNS	Central nervous system
DA	Diminazene aceturate
EOs	Essential oils
g	Gram
h	Hour
IC_{50}	50% Inhibitory concentration
KDNA	Kinetoplast DNA
kg	Kilogram
L. donovani	*Leishmania donovani*
L. infantum	*Leishmania infantum*
L. mexicana	*Leishmania mexicana*
LC_{100}	100% Lethal concentration
LC_{50}	50% Lethal concentration
LC_{90}	90% Lethal concentration
LD_{50}	50% Lethal dose
LD_{90}	90% Lethal dose
M	Molar
mg	Milligram
mL	Milliliter

Abbrev.	Full-term
nm	Nanomole
P. falciparum	*Plasmodium falciparum*
PBS	Phosphate-buffered saline
PBSG	Phosphate-buffered saline glucose
PCV	Packed cell volume
SI value	Selectivity index value
T. b. brucei	*Trypanosoma brucei brucei*
T. b. gambiense	*Trypanosoma brucei gambiense*
T. b. rhodesiense	*Trypanosoma brucei rhodesiense*
T. cruzi	*Trypanosoma cruzi*
T. equiperdum	*Trypanosoma equiperdum*
T. evansi	*Trypanosoma evansi*
wt	Weight
µg	Microgram
µl	Microliter
WBCs	White blood cells count
RBCs	Red blood cells count
HGB	Haemoglobin
PLT	Platelet count
TP	Total protein
Alb	Albumin

Abbrev.	Full-term
Glb	Globulin
A/G%	The ratio of albumin to globulin.
CREAT.	Creatinine
UA.	Uric acid
ALT	Alanine transferase.
AST	Aspartate aminotransferase
ALP	Alkaline phosphatase
T.Chol.	Total cholesterol
TG.	Triglycerides
BilD.	Direct bilirubin
GLU.	Glucose
GOD	Glucose oxide
POD	Peroxidase
LDH	Lactate dehydrogenase enzyme

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