Original Article

Determination of Haematological Effects of Extracts of *Reseda sphenocleoides* Leaves in Albino Rats Infected with *Entamoeba histolytica*

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ABSTRACT

Objectives: This research was designed to examine improvements in some heamatological parameters of *Entamoeba histolytica*-infected rats treated with extracts of *Reseda sphenocleoides* leaves. **Methods:** Twenty rats weighing between 200-220 g were divided into 4 groups (Each per group containing 5 rats). Fifteen rats were infected by oral administration (17×10^3 cell/ml) of *E. histolytica* obtained from the stool. Infected rats were classified in differentiated three groups A, B, C. In addition, the negative control group E. The groups (A and B) were administered with the ethanolic and aqueous extracts at the dose of 500 mg/kg body weight/day, the group C was administered with metronidazole, in a dose 500 mg/kg body weight (Positive control group). The negative control group E was uninfected and untreated. The hematological parameters in the different groups were monitored throughout the period of study which was 10 days on three stages. **Results:** The results show a significant increase at $P \leq 0.05$ in Red Blood Cell Count (RBC), Haemoglobin (Hb), Hematocrit (HCT), Mean Cell Volume (MCV), Red Cell Distribution Width (RDW), Procalcitonin Test (PCT) and Lymphocyte (LY) in groups which treated with *R. sphenocleoides* extracts compare with metronidazole drug and the negative control group during treatment stages. While the results show a decrease of significant at $P \leq 0.05$ in Platelet (PLT), Mean Platelet Volume (MPV), Platelet Distribution Width (PDW), Total White Blood Cell (WBC), Monocyte (MO) and Granulocytes (GR) in groups which treated with *R. sphenocleoides* extracts in comparison with the control groups of rats. The results also indicate no changes of significance at $P > 0.05$ in Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Hemoglobin Concentration (MCHC) during treatment stages. **Conclusion:** The findings of this study, the efficiency of *R. sphenocleoides* extracts in improving blood standards in rats infected with *E. histolytica*.

Key words: *Reseda sphenocleoides*, Extract, *Entamoeba histolytica*, Haematological, Albino rats.

INTRODUCTION

Amoebiasis infection represents a large and serious medical and public health problem in developing countries due to its nutritional consequences.[1] It is a dangerous disease that is transmitted to humans by infection with this parasite occurred by water and food contaminated with cysts of *Entamoeba histolytica*.[2] The trophozoites active invades of the intestines muscular and penetrates the intestinal muscle wall and feeds on the erythrocyte.[3] The trophozoites continue to corrode the intestinal epithelium, leading to ulcers in the intestinal muscular.[4] Most of the infection is asymptomatic; however, in symptomatic patients, it is associated with malabsorptive diarrhea.[5] Also, the incidence infection of these parasites can lead to low birth weight, reduced productivity in adulthood, stunted growth, reduced

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hemoglobin concentration and iron level in the blood which leads to anemia.[6]

World health organization reported that infect 10% of the world's population, up to 50 million cases of invasive amoebiasis and it is responsible for 100,000 deaths per year worldwide it ranks third among parasitic diseases that result to death worldwide; if not in second to malaria as a protozoan cause of death.[7] The disease is prevalent worldwide, but the highest prevalence rates have been recorded in developing countries, Indian sub-regions, parts of Central and Southern America and tropical regions of Africa.[8]

Despite decades of research, metronidazole remains a drug of therapy in option first for the treatment of amoebiasis,[9] though that is the resistance of drug by *E. histolytica*, so resulted in the urgent want in increasing doses to get over the infection. In addition, this drug has several untoward side effects such as headaches, metallic taste in the mouth and vomiting as well as neurotoxicity.[9] The resistance of amoebiasis to drugs such as metronidazole has become a serious problem in developing countries.[10]

Reseda sphenocleoides Deflers belongs to the family Resedaceae is endemic to southwest Arabia, Hadramaut, Aden-Yemen.[11] The leaves of *R. sphenocleoides* were used as a tranquilizer and it is useful in the treatment of insomnia.[11]

R. sphenocleoides leaves were used in traditional medicine in the Yemeni countryside to treat many cases of diarrhea, especially those that occur in their animals.[12] The *R. sphenocleoides* leaves showed anti-helminths, a tranquilizer and diuretic.[13]

The study aimed to investigate the effect of *R. sphenocleoides* leaves extracts on haematological changes in rats infected by *E. histolytica*.

MATERIALS AND METHODS

Plant collection

The *R. sphenocleoides* leaves were collected from the Rdfan villages in Lahj governorate, Yemen (13°26'N, 44°59'W). The selected leaves were identified and authenticated by Dr. Othman Saad Saeed Al-Hawshabi in the Department of Biology, Faculty of Science at Aden University, Aden, Yemen. Specimen number KA144/19/20/34. leaves of *R. sphenocleoides* were washed by using tap water to take off filth and dust on the roof after that the leaves were dried under a shade and grinded into powder by using an electrical mixer.

Preparing of plant extracts

The powdered that is dray of *R. sphenocleoides* leaves, 40 g was weighed and dissolved in 400 ml of ethanol were extracted in a Soxhlet apparatus at 50-55°C, till the color extract disappeared to get an extract, also, 40 g was weighed and dissolved in 400 ml of distilled water in a beaker by mixing using a magnetic stirrer for 24 hr. The mixture was filtrated from each extract by four layers of gauze cloth. The filtrate was centrifuged at 3000 rpm for 10 min. The supernatant was collected and filtered through Whatman No. 1 filter paper. The solvent was evaporated lay Rotary evaporator. After that, it was transferred to an incubator for 24 hrs at 50°C.[6,14]

Qualitative phytochemical testing

The crude extracts were subjected to qualitative phytochemical screening to determine the absence or presence of chosen chemical constituents by using analysis methods which are described by Mehdi *et al*.[6]

Experimental animals and design

3-3.5 months old healthy white albino rats (*Rattus norvegicus*) weighing between 200g and 220g were used in this study. The rats were acclimatized to laboratory conditions for two weeks and were fed *ad libitum* food and water. Ethical guidelines and procedures for handling experimental animals were followed. Twenty white albino rats were used in this study; fifteen rats were infected by oral administration (17×10^3cell/ml) of *E. histolytica* obtained from the stool. Infected rats were divided into three groups in additional to, control group. Each group containing five rats, which were orally administered for 10 days.

Group A: Infected and administered with ethanolic extract (500 mg/kg body weight).

Group B: Infected and administered with aqueous extract (500 mg/kg body weight).

Group C: Infected and administered with metronidazole (500 mg/kg body weight).

Group E: The control group uninfected and untreated.

Collecting samples of blood

The samples of blood were collected before the beginning of treatment (Pre-treatment stage), then on the 5th day of treatment (Mid-treatment stage) and finally on the 10th day of treatment (Post-treatment stage) in each group from the vein at region next to the eye using capillary tubes. Then the blood was put in sterile vials (1.0–2.0 ml) containing EDTA which were used as an anticoagulant for the blood. After that blood was tested for complete blood count (CBC).

Determination of haematological parameters

The haematological parameters were determined using the method as described by Mehdi *et al*.[9]

Statistical analysis

The results of the present study were analyzed by Genstat® (Version 5.2) using general treatment structure (no blocking), factorial experiment, with 5 replications. Least significant different test (LSD) was used to test the difference between means (groups) at $P \leq 0.05$ and was considered significant.

RESULTS

Qualitative tests of some active compounds in plant extracts

Preliminary phytochemical screening of the constituents of the extracts is useful as an exercise in identifying the possible phytochemical groups present in each extract in the plants. Phytochemical screening of *R. sphenocleoides* extracts showed the existence of tannins, flavonoids, glycosides, phenols, resins, saponins, furanocoumarin, triterpenoids, amino acids and carbohydrates in ethanolic and aqueous extracts of *R. sphenocleoides* leaves. The ethanolic extract contains alkaloids while aqueous extract does not alkaloids, but terpenes and sterols were absent in both extracts Table 1.

Effects of extracts of *R. sphenocleoides* leaves on erythrocytic parameter profiles in albino rats infected with *E. histolytica*.

Extracts of the leaf from *R. sphenocleoides* caused changes in erythrocytes and connected parameter profiles in *E. histolytica*-infected rats (Table 2). Before the administration of extracts, the results showed that the heamatological profile of rats which were infected by *E. histolytica* a significant decrease ($P \leq 0.05$) in RBC, Hb, HCT, MCV and RDW in pre-treatment stage in comparison with the negative control group (Table 2). Also, in the same stage, the rats infected with *E. histolytica* showed a significant increase ($P \leq 0.05$) in MCHC compared with negative control (Pre-treatment stage). However, no significant change ($P > 0.05$) in the MCH level was observed in the same stage.

In five days after (Mid-treatment stage) of administration with extracts of *R. sphenocleoides* at the dose levels of 500 mg/kg and 500 mg/kg of metronidazole, a significant increase was observed ($P \leq 0.05$) in RBC, Hb, HCT and RDW in groups which were treated by ethanolic and aqueous extracts of *R. sphenocleoides* in comparison with pre-treatment stage and with negative control and

Table 1: The phytochemical composition of *R. sphenocleoides* leaves.

Group	Test	Observation	Inference
Alkaloids	Mayer's reagent	E – white precipitate A – no precipitate	+ -
Flavonoids	Ethyl alcohol + Potassium hydroxide	E – yellow colour A – yellow colour	+ +
Glycosides	Benedict's reagent	E – red precipitate A – red precipitate	+ +
Phenols	Ferric chloride	E – green colour A – green colour	+ +
Resins	Ethyl alcohol + Hydrochloric acid	E – turbidity A – turbidity	+ +
Saponins	Foam test and Mercuric chloride	E – white precipitate and frothing A–white precipitate and frothing	+ +
Terpenes and Sterols	Chloroform + Acetic acid + Sulfuric acid	E – no colour A – no colour	- -
Tannins	Lead acetate	E – gelatinous precipitate A – gelatinous precipitate	+ +
Furanocoumarin	Potassium hydroxide	E – red color or purple A – red color or purple	+ +
Triterpenoids	Chloroform + Sulfuric acid	E – red color or purple A – red color or purple	+ +
Amino acids	Ninhydrin Reagent	E – purple colour A – purple colour	+ +
Carbohydrates	Mayer's reagent	E – violet color ring A – violet color ring	+ +

Key: A = Aqueous extract, E = Ethanolic extract, + = present, - = absent.

Table 2: Effects of ethanolic and aqueous leaves extracts of *R. sphenocleoides* on erythrocytic parameter profiles in albino rats infected with *E. histolytica*.

Parameters	Type Treatment	Pre-Treatment	Mid-Treatment	Post-Treatment	Means	LSD 5%
RBC (10^6/mm^3)	Control	8.690	8.377	8.887	8.651	0.2930
	Metronidazole	6.987	8.040	8.070	7.699	
	Ethanolic extract	6.547	7.003	7.713	7.087	
	Aqueous extract	6.090	6.427	7.440	6.652	
Means		7.08	7.46	8.03	7.52	
Hb (g/dL)	Control	13.97	14.77	15.97	14.90	0.871
	Metronidazole	12.17	15.23	15.60	14.33	
	Ethanolic extract	12.23	14.27	15.73	14.08	
	Aqueous extract	11.37	15.30	16.00	14.22	
Means		12.44	14.89	15.83	14.38	
HCT (%)	Control	41.20	45.40	47.67	44.76	0.894
	Metronidazole	35.40	43.37	46.97	41.91	
	Ethanolic extract	41.73	42.37	47.20	43.77	
	Aqueous extract	40.33	42.10	47.00	43.14	
Means		39.67	43.31	47.21	43.40	
MCV (mm3)	Control	56.17	56.50	54.50	55.72	2.226
	Metronidazole	50.90	53.80	58.77	54.49	
	Ethanolic extract	52.70	53.97	56.47	54.38	
	Aqueous extract	52.53	53.73	55.20	53.82	
Means		53.08	54.50	56.24	54.60	
MCH (pg /cell)	Control	18.70	18.37	19.30	18.79	1.062
	Metronidazole	17.97	17.97	17.97	17.97	
	Ethanolic extract	17.83	18.23	19.53	18.53	
	Aqueous extract	19.57	19.73	20.07	19.79	
Means		18.52	18.58	19.22	18.77	
MCHC (g/dL)	Control	31.50	35.50	32.20	33.07	1.725
	Metronidazole	35.90	35.87	35.40	35.72	
	Ethanolic extract	34.80	34.23	33.07	34.03	
	Aqueous extract	34.03	37.17	37.63	36.28	
Means		34.06	35.69	34.58	34.78	
RDW (%)	Control	17.80	17.37	17.00	17.39	0.637
	Metronidazole	15.87	16.00	17.30	16.39	
	Ethanolic extract	16.10	17.40	17.43	16.98	
	Aqueous extract	17.93	17.17	17.07	17.39	
Means		16.93	16.99	17.20	17.04	

Least Significant Differences (LSD), Red Blood Cell (RBC), Hemoglobin (Hb), Haematocrit (HCT), Mean Cell Volume (MCV), Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC), Red Cell Distribution Width (RDW).

metronidazole group. While the values of MCV, MCH and MCHC showed a slight increase after five days of treatment but non-significant (P>0.05) in comparison with the pre-treatment stage.

Table (2) shows the dose level of 500 mg/kg of extracts caused important increase (P≤0.05) in RBC, Hb, HCT, MCV and RDW in all groups in ten days after administration of the ethanolic and aqueous extracts of *R. sphenocleoides* when compared with metronidazole group. Also, the results showed that MCH and MCHC have no significant differences (P>0.05) when compared with the metronidazole group during the treatment period.

Effects of extracts of *R. sphenocleoides* leaves on platelets and their connected parameter profiles in albino rats infected with *E. histolytica*

The leaf extracts of *R. sphenocleoides* caused changes in platelets and their connected parameters in normal profiles (Table 3). Before the administration (Pre-treatment stage)

Table 3: Effects of ethanolic and aqueous leaves extracts of *R. sphenocleoides* on platelets and their connected parameter profiles in albino rats infected with *E. histolytica*.

Parameters	Type Treatment	Pre-Treatment	Mid-Treatment	Post-Treatment	Means	LSD 5%
PLT (10^3/µL)	Control	447	472	610	509.67	
	Metronidazole	916	673	505	698.00	
	Ethanolic extract	689	611	535	611.67	**66.6**
	Aqueous extract	701	673	567	647.00	
Means		688.25	607.25	554.25	616.58	
PCT (%)	Control	0.295	0.283	0.387	0.322	
	Metronidazole	0.367	0.677	0.318	0.454	
	Ethanolic extract	0.342	0.323	0.361	0.357	**0.01303**
	Aqueous extract	0.347	0.357	0.368	0.342	
Means		0.338	0.410	0.359	0.367	
MPV (fL)	Control	6.600	6.000	6.367	6.322	
	Metronidazole	6.600	6.167	6.000	6.256	
	Ethanolic extract	6.400	6.400	6.300	6.367	**0.1748**
	Aqueous extract	6.367	6.867	5.867	6.367	
Means		6.492	6.359	6.134	6.328	
PDW (%)	Control	15.70	14.67	13.70	14.69	
	Metronidazole	18.97	16.47	17.30	17.58	
	Ethanolic extract	15.83	17.03	12.92	15.28	**0.647**
	Aqueous extract	15.83	17.67	11.73	15.08	
Means		16.58	16.46	13.91	15.65	

Least Significant Differences (LSD), Platelet (PLT), Procalcitonin Test (PCT), Mean Platelet Volume (MPV), Platelet Distribution Width (PDW)

of extracts, the results showed increased significantly ($P \leq 0.05$) in PLT, PCT and PDW in *E. histolytica*-infected rats in comparison with the negative control group (Table 3). In the same stage, the results showed that MPV has no significant different ($P > 0.05$) that is compared with the negative control group.

In five days after administration (Mid-treatment stage) of the ethanolic and aqueous leaves extracts of *R. sphenocleoides*, the dose level of 500 mg/kg caused changes in platelets and their connected parameters in rats infected with *E. histolytica* parasite (Table 3). The dose of 500 mg/kg caused a significant decrease in PLT and MPV in groups which were treated with extracts when compared with and pre-treatment stage. On one side, the results showed a significant increase in PCT and PDW in groups which were treated with extracts when compared with and pre-treatment stage.

After ten days (Post-treatment stage) of administration, the dose level of 500 mg/kg caused a significant increase ($p < 0.05$) in PCT in comparison with the pre-treatment and the mid-treatment. However, the same dose caused a significant decrease in PLT, MPV and PDW when it is compared with the negative control group and the metronidazole group.

Effects of extracts of *R. sphenocleoides* leaves on total WBC and differential WBC counts in albino rats infected with *E. histolytica*

The WBC and the differential leucocytic counts values are presented in (Table 4). Before the administration of extracts, the results showed a significant increase ($P \leq 0.05$) in WBC, MO and GR in *E. histolytica*-infected rats in comparison with the negative control. On the other hand, the results showed a significant decrease in LY in comparison with the negative control.

After five days (Mid-treatment stage) of administration with the extracts of *R. sphenocleoides,* a significant decrease was observed in WBC, MO and GR in all groups treated with extracts when it is compared with the pre-treatment stage and metronidazole group. The LY showed no significant increase ($P > 0.05$) when it is compared with the pre-treatment stage and comparison with the metronidazole group.

After ten days (Post-treatment stage) administration with extracts of *R. sphenocleoides* at the dose levels of 500 mg/kg, there was a significant decrease observed ($P \leq 0.05$) in WBC, MO and GR in all groups treated in comparison with metronidazole group. But, there was a significant increase ($P < 0.05$) in the percentage of LY

Table 4: Effects of ethanolic and aqueous leaves extracts of *R. sphenocleoides* on total WBC and differential WBC counts in albino rats infected with *E. histolytica*.

Parameters	Type-Treatment	Pre-Treatment	Mid-Treatment	Post-Treatment	Means	LSD 5%
WBC (10^3)	Control	8.07	7.27	9.20	8.18	1.402
	Metronidazole	10.57	10.67	11.90	11.05	
	Ethanolic extract	16.00	12.43	7.43	11.96	
	Aqueous extract	15.37	12.03	8.03	11.81	
Means		12.50	10.60	9.14	10.75	
LY (%)	Control	93.07	97.00	95.77	95.28	2.453
	Metronidazole	88.97	89.93	92.00	90.30	
	Ethanolic extract	87.37	91.20	92.87	90.48	
	Aqueous extract	85.73	87.90	92.73	88.79	
Means		88.79	91.51	93.34	91.21	
MO (%)	Control	3.97	2.00	3.30	3.09	1.956
	Metronidazole	8.40	7.97	5.80	7.39	
	Ethanolic extract	9.20	7.07	5.23	7.17	
	Aqueous extract	10.20	9.90	5.47	8.52	
Means		7.94	6.74	4.95	6.54	
GR (%)	Control	1.80	1.00	1.10	1.30	0.648
	Metronidazole	2.63	2.10	2.20	2.31	
	Ethanolicn extract	3.43	1.73	1.90	2.36	
	Aqueous extract	4.07	2.20	2.10	2.79	
Means		2.98	1.76	1.83	2.19	

Least Significant Differences (LSD), Total White Blood Cell (WBC), Lymphocyte (LY), Monocyte (MO), Granulocytes (GR).

counts at the dose level of 500 mg/kg after ten days of administration of the extracts in comparison with the metronidazole group.

DISCUSSION

Phytochemical screening of extracts of *R. sphenocleoides* leaves

Results of qualitative tests were shown for extracts of *R. sphenocleoides* in Table 1. Generally, both ethanolic and aqueous extracts contain several types of active compounds such as flavonoids, glycosides, phenols, resins, saponins, tannins, furanocoumarin, triterpenoids, amino acids and carbohydrates. This is due to the use of ethanol which provides a polar medium. Consequently, polar compounds will be easily extracted. The aqueous extract did not contain alkaloids while the ethanolic extract contains alkaloids. Because of the use of ethanol as a high selectivity solvent of alkaloids compounds.[15]

Effect of *R. sphenocleoides* leaves extracts on haematological parameters

This present study revealed the decrease in RBC, Hb, HCT, MCV, RDW, MPV, MCH and LY in all rats infected with *E. histolytica* parasite. This can be due to the destruction of red blood cells by *E. histolytica*. Also, it may be due to high *E. histolytica* numbers in the intestines of the rats which caused the digestive disturbance. This leads to a difficulty or inability in the absorption of iron by the body.[16]

In addition, the parasite consumes and degrades the red blood cell proteins which are mainly hemoglobin.[17] On another hand, the results showed an increase in MCHC, PLT, PCT, WBC, MO and GR in *E. histolytica*-infected rats. The increase in PLT might be due to haemolytic anaemia. In addition, the increase in WBC, MO and GR suggests a boost in the immune system to resist the infection.[18] Moreover, the increase in MCHC may be due to that the RBC is fragile or destroyed, or because of the present of some immature RBC into blood circulation which may cause an increase in MCHC values. This agrees with Kotepui *et al.*[19] and Mehdi *et al.*[6] they found that *E. histolytica*-infection rats it has an effect on Hb, MCV and MCH values.

The present study showed that extracts of *R. sphenocleoides* demonstrated changes in erythrocytic parameter profiles in *E. histolytica*- infected rats at the dose of 500 mg/kg. The significant increase in RBC, Hb, HCT, MCH and MCV after oral administration of extracts of *R. sphenocleoides* state that the extracts may consist of phytochemicals and compounds which stimulate the secretion or

formation of erythropoietin which leads to enhance the production of red blood cells (erythropoiesis). Presence of antioxidant phytochemicals such as tannins and terpenoids in the extracts of *R. sphenocleoides* perhaps responsible for the haemopoietic stimulating influences. This result agrees with Wambi *et al.* who stated that antioxidant phytochemicals in the extracts of the plant increased cells of haemopoietic origin in experimental animals significantly.[20] Also, study Grassmann who stated that tannins, flavonoids and terpenes work to protect erythrocytes from the oxidative damage.[21] This might have contributed to the increase in Hb and HCT observed in extracts treated groups. This result agrees to what was found by Enechi *et al.* who stated that crude extracts of *Pleiocarpa mutica* leaves increased in Hb and HCT in *Plasmodium-berghei*-infected mice.[22]

In the present study, the effects of extracts of *R. sphenocleoides* on platelets and their connected parameter profiles in *E. histolytica*-infected rats showed a significant decrease in PLT, MPV and PDW. The extracts may contain phytochemicals and compounds that are capable of maintaining the normal platelets in the blood and thus replenishment of lost blood and curbing anaemia that may be caused by the *E. histolytica*. This is a result consistent with earlier studies.[23,24]

In the present study, the effects of extracts of *R. sphenocleoides* on total WBC and differential WBC counts in *E. histolytica*-infected rats showed a significant decrease in WBC, MO and GR compared with the metronidazole group and the pre-treatment stage. The decrease in WBC may be a result of the reduction of the infection. This agrees with Bassey and Edoamodu who stated that some herbals extracts lead to a decrease in WBC in *Plasmodium berghei* infected mice.[25]

On the other hand, in the same stage, a significant increase was observed in LY. The increase in LY may be due to that the extracts contain bioactive ingredients that help dividing lymphocytes. Therefore, LY is involved in immune functions like the production of immunoglobulin and modulation of immune defense. This result agrees with Buncharoen *et al.*[26] who stated that *Temona aphylla* extract leads to an increase of lymphocytes in the treated rats.

CONCLUSION

The findings of this study, that the efficiency of *R. sphenocleoides* extracts in improving blood standards through variations occurring in blood proportion and not adversely affect the haematological parameters better than Metronidazole drug.

Ethics approval

Institutional guidelines for the care and use of animals were followed. All procedures performed in the study involving animals were by the ethical standards of the institution or practice at which the study was conducted date 16/08/2018.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ABBREVIATIONS

LSD: Least significant differences; **RBC:** Red blood cell; **Hb:** Hemoglobin; **HCT:** Haematocrit; **MCV:** Mean cell volume; **MCH:** Mean corpuscular hemoglobin; **MCHC:** Mean corpuscular hemoglobin concentration; **RDW:** Red cell distribution width; **PLT:** Platelet; **PCT:** Procalcitonin Test; **MPV:** Mean platelet volume, **PDW:** Platelet distribution width; **WBC:** Total white blood cell; **LY:** Lymphocyte **MO:** Monocyte; **GR:** Granulocytes.

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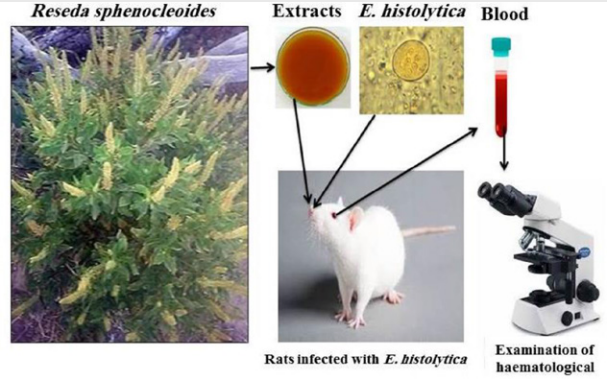
PICTORIAL ABSTRACT



SUMMARY

The present study was designed to evaluate the changes in some heamatological parameters of *E. histolytica*-infected rats treated with extracts of *R. sphenocleoides* leaves.

The rats were infected by oral administration (17×10^3 cell/ml) of *E. histolytica* obtained from the stool. The crude extracts *R. sphenocleoides* were extracted with ethanol and distilled water. Additionally, chemical detection of alkaloids, flavonoids, glycosides, phenols, resins saponins, terpenes, sterols, tannins, furanocoumarin, triterpenoids, amino acids carbohydrates were carried out. The infected rats were treated by extracts *R. sphenocleoides* compared with metronidazole drug. This study that the *R. sphenocleoides* extracts showed improvement in haematological parameters in *E. histolytica*-infected rats better than Metronidazole drug.

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