EFFECTS THE N-HEXANE EXTRACT OF CASTOR *(RICINUS COMMUNIS)* SEEDS ON SOME BLOOD PARAMETERS

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ABSTRACT

Objective:
To investigate the effects of Castor plant *(Ricinus commuis* variety minor) seeds on some haematological parameters

Materials and methods
The seeds of Castor plant were obtained, dried, pulverized, and exhaustively soxhlex extracted in N-hexane at 75°C for 72 hours. This was dissolved in appropriate volumes of corn oil to make a concentration of 20mg/ml. The extract was administered to twenty five (25) adult wistar rats at a dose of 1.2ml/kg/b.w, S.C daily for 90 days. The blood parameters were determined by the methods of Dacie and Lewis, and of Ibu and Adeniyi.

Results
The bleeding time, clotting time, haemoglobin level, haematocrit, red blood cell count., MCV, MCH and MCHC were determined. There was a raised BT in treated rates compared to control even though within the normal range. MCV and MCH were only slightly reduced.

Conclusion:
Castor seed does not adversely affect haematological parameters.

KEY WORDS, *Ricinus communis*, Castor, Blood, Rats.

INTRODUCTION

Castor plant*(Ricinus communis)* is a member of the family, Euphorbiceae and has been studied extensively (1). It is known as *'Zurma'* in Hausa. Some of the uses of castor plant include being a purgative, a radio diagnostic agent, and a vehicle for some ophthalmic preparations (2). The toxicological effects of castor seed oil has been evaluated, and it has been reported to have a large therapeutic index and a wide margin of safety (3). Probably, the most widely studied effect of Castor seed in our environments is in the area of anticonception (4,5). Das et al (6) report that this plant does not affect hepatic nor renal functions, and that it also does not significantly influence cholesterol and lipoprotein levels. Trease and Evans (1) identified some fixed oils in the Castor seed oil and these include; glycosides of ricinoleic, isoricinoleic, stearic and dihydrostearic acids.

There is a growing rate in the use of plants in tradomedical practice (7) and this also involves a number of recorded adverse effects. (8). Some plants have been investigated for their effects on haematological parameters, (9,10), and the reports are as varied as the studies. Castor plant is currently being used as an anticonceptive among other uses (4) and determination of its effects on blood would be a useful information as regards its extent of safety. This study therefore aimed to ascertain the effect of Castor seed on some blood parameters.

MATERIALS AND METHODS

Extraction:

The seeds of *Ricinus communis* (castor Plant) were obtained, dried, pulverized and subjected to exhaustive Soxhlex extraction in N hexane at 75°C for 72 hours. The extract was weighed and kept at 4°C until required for use.

Animals:

Fifty (50) adult wistar rats were obtained from the Animal House, University of Jos, and adapted at normal room temperature of 25°C to 27°C, 12 hours light and 12 hours darkness. The animals were fed and libitum. The crude extract of the Castor seed was dissolved in appropriate volumes of corn oil to give a concentration of 20mg/ml after the method of Okwuasaba et al (11).

The animals were divided into two groups of twenty-five (25) rats each. Group 1 was treated with 1.2mg/kg/b.w of the dissolved extract subcutaneous. Rats in group 2 (Control) were given only plain corn oil. The injection of the extract was done once daily for 90 days.

Determination of haematological parameters:

a) **Bleeding time:-** Bleeding time was determined by the method of Dacie and Lewis (12). Each rat was restrained in a cage, and the exposed tail cleaned with 70% alcohol. A sterile lancet was used to prick the tail to a depth of 3mm, and a stop watch started immediately. After every 15 secs, the blood was blotted of using whatman filter paper until no stain of blood appears on the filter paper. The time is recorded as bleeding time.

b) **Clotting time:-** Clotting time was determined by the method of Dacie and Lewis (12). The exposed tail part of the restrained rats was cleaned with 70% alcohol and with a sterile lancet, pricked. Blood was collected on a clean grease free slide. A stop watch was started and at 15min interval, an office pin was passed through the drop gently (with care taken to observe the fibrin strands). The time taken for the fibrin formation was noted as clotting time.

c) **Packed cell volume:-** PCV was determined using the microhaematocrit centrifuge method as described by Dacie and Lewis (12).

d) **Haemoglobin concentration:** Hb level was determined by the oxyhaemoglobin method described by Ibu and Adeniyi (13).

e) **Red blood cell count;** RBC count was determined by the method of Ibu and Adeniyi (13).

f) Blood indices were derived by calculations.

The data are presented as means (± S.E.M) and comparism was made using student's t-test.

RESULTS

Table 1: Means Comparison of some haematological parameters in adult wistar rats treated with the N-hexane extract of *R. communis.*

	n	BT (min)	CT (min)	PCV (%)	Hb g/dl	RBC ($x10^6$)
Control	25	1.5±0.06	2.0±0.06	50.0±0.07	16.2±1.20	8.10±0.13
Treated	25	2.5±0.05	2.1±0.06	50.5±0.06	16.6±0.07	8.0±0.10

BT = Bleeding Time: CT = Clotting Time

Table 2: Comparison of means of some haematological indices in adult wistar rats treated with N-hexane extract of *R. communis.*

	N	PCV (%)	Hb g/dl	RBC ($X10^6$)	MCH (fl)	$MCH_{(pg)}$	MCHC g/dL
Control	25	50.0	16.2	8.1	16.7	20.0	32.4
Treated	25	50.0	16.6	8.0	63.1	20.8	32.9
			(P>0.05)				

Table 1 shows the mean values of some haematolgoical parameters in the control group as; BT, 1.5 ± 0.06 min, CT, 2.0 ±0.06min, PCV, 50.0 ± 0.07%, Hb, 16.2 ± 1.2 g/dl and RBC 8.10 ± 0.13 X 10^6. The values in the treated group are; BT, 2.5 ± 0.05min, CT, 2.1 ± 0.06min, PCV, 50.5 ± 0.06%, Hb, 16.6 ± 0.07, and RBC 8.0 ± 0.1 x 10^6. The bleeding time was significantly prolonged in rats treated with *R. communis,* compared with the control (P<0.05). There was no significant difference in the two study groups for the other parameters (P>0.05).

The mean cell volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) are shown in Table 2. The values are: MCV 61.7fl, MCH 20.0pg and MCHC 32.4 g/dl in the control group; and MCV 63.1 fl, MCH 20.8pg and MCHL 32.9g/dl in the treated group. There was no significant differences between the indices in the study and control groups (P>0.05).

DISCUSSION

Castor *(Ricinus communis)* seed is being used traditionally as a female contraceptive, as a purgative and in radiological investigations (4). This study finds that the bleeding time (BT) is significantly increased in rats treated with castor seed compared with the control (P<0.05) though the BT in the treated rats, 2.5min is normal. The clotting time (CT), haemoglobin concentration (Hb), packed cell volume (PCV) and red blood cell count (RBC) did not reveal any special influence of the castor seed, though the clotting time is prolonged in both groups. The MCV and MCH are slightly reduced in both groups but there is no significant different between the groups. There was no change in MCHC.

The present study further corroborates the safety margin of castor seed (3). There has not been much report on the haematolgoical effects of castor seed. The lack of detectable influence of castor seed on blood could be as a result of the presence of some fixed oils in it (1), reflecting poor absorption. The plant has been reported to have estrogenic activity (4,11), and one would expect some influence on some hematological parameters. The absence of these expected influence may suggest that the estrogenic effects (11) may be local to the female reproductive organs.

It is concluded that castor *(Ricinus communis, var. minor)* seeds do not adversely influence hematological parameters, and the study corroborates the wide safety margin of the plant.

ACKNOWLEDGMENT

The authors thank the laboratory staff of physiology and pharmacology departments, University of Jos.

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