

Haematological Response in Testosterone Propionate Induced Prostatitis Co-Treated with Aqueous Leaf and Seed Extracts of *Artocarpus Heterophyllus*

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Abstract:- This study seeks to examine the effects of aqueous extracts of *Artocarpus heterophyllus* leaves and seeds on haematological profile of prostatic male wistar rats induced using testosterone propionate (TP). One hundred male wistar rats (100-125g) grouped into 10 of 10 rats each were obtained from the Department of Pharmacology, University of Port Harcourt Animal House. The various groups were fed and administered with various concentrations (100mg/kg, 200mg/kg, 300mg/kg and 200mg/kg combined extract) of the leaves and seeds extracts of *A.heterophyllus*. The haematological profile was done on the male Wistar rats on day 21, 42 and 63 of the experiment using standard laboratory methods. Results obtained revealed that the leaves and seeds extracts were shown to have a stabilizing and ameliorative effect on the haematological parameters With PCV (%) range 13.20 ± 0.21 in group 2 at day 42 with maximum values 39.67 ± 0.20 seen in group 5 day 42. HB(g/dl) 5.00 ± 0.15 (group 2 day 63) to 13.23 ± 0.39 (group 5 day 42), RBC($X10^{12/l}$) count 1.45 ± 0.14 (group 2 day 42) to 5.93 ± 0.15 (group 5 day 42), WBC ($X10^9/l$) 4.07 ± 0.20 (group 5 day 42) to 37.80 ± 0.34 (group 2 day 42), Platelet($X10^9/l$) 201.33 ± 0.09 (group 5 day 42) to 363.00 ± 0.52 (group 2 day 21), Neutrophils 20.33 ± 0.49 (group 5 day 42) to 49.35 ± 0.34 (group 2 day 42), Lymphocytes 52.30 ± 0.51 (group 5 day 42) to 84.24 ± 0.17 (group 2 day 42), Eosinophils 2.10 ± 0.57 (group 5 day 42) to 9.00 ± 0.53 (group 2 day 42) , Monocytes 5.33 ± 0.32 (group 5 day 42) to 12.67 ± 0.53 (group 2 day 42). These values obtained were shown to be significantly different with the negative control (induced untreated) group and not significantly different from the normal and standard drug treated group revealing high ameliorative potentials especially in groups 5 (Rats induced with TP 4mg/kg and administered 200mg/kg of aqueous extract of *Artocarpus heterophyllus* leaves) by day 42.

Keywords:- *Artocarpus heterophyllus*, Prostatitis, Haematological profile, Testosterone propionate.

I. INTRODUCTION

Several compounds have been noted to be toxic to the body on exposure (Olua *et al.*, 2018; Ighariemu *et al.*, 2023). Testosterone propionate, sold under the brand name Testoviron among others have proven to be one of such toxic compounds especially on illicit usage (Kayode *et al.*, 2020). Testosterone propionate is an androgen and anabolic steroid (AAS) medication which is used mainly in the treatment of low testosterone levels in men (Jin *et al.*, 2018). However, studies have revealed that same testosterone propionate with lots of beneficial effects is not devoid of some side effects as it's been reported to induce benign prostatitis in males (Kayode *et al.*, 2020). Benign prostate hyperplasia (BPH) is a common urological disorder in growing men who had attained at least forty years of age. (Jin *et al.*, 2018; Keong, 2017) Benign prostate hyperplasia occurrence in older men is influenced by conditions such as diabetes, reduced physical activity, obesity, hyperlipidemia and alcohol intake. Novel methods for prevention and diagnosis of this condition could be deciphered by analysing these risk factors and other potential modifiable risk factors (Parsons, 2007; Kayode *et al.*, 2020). Studies revealed that High red blood cell and platelet counts were associated with an increased risk of prostate cancer. Higher haemoglobins were associated with a lower prostate cancer risk while higher white blood cell and neutrophil count were associated with prostate cancer mortality (Eleanor *et al.*, 2021).

Folate, iron and testosterone are key to erythropoiesis (synthesis of red blood cells), low level of any of these could lead to reduced RBC count (Valent *et al.*, 2018; Coviello *et al.*, 2008, Carrero *et al.*, 2012; Roy *et al.*, 2017). Reduction of prostate cancer risk could result to Low free testosterone concentrations (Watts *et al.*, 2018) and reports exists that iron, vitamin B12 and folate, could be linked with prostate cancer risk (Price *et al.*, 2016; Ghoshal *et al.*, 2014). Increased level of white blood cell and platelets could result from infections and inflammations as seen in testosterone propionate toxicity (Ghoshal *et al.*, 2014). Previous studies show that inflammation may however be associated to cancer incidence, however, it is uncertain if these factors are specifically associated with prostate cancer risk (Doat *et al.*, 2018, Sfanos *et al.*, 2013).

Since it is on record that testosterone propionate could induce prostatitis, it is therefore expedient to monitor the effect of a proposed herbal ameliorative therapy on hematological profile of testosterone propionate induced prostatitis in wistar rats on co-administration of testosterone propionate and the proposed herbal therapy. Several plants have been known to have lots of therapeutic potentials especially as it relates with biochemical markers and phytochemical constituents of plants (Nwaichi and Olua, 2015). Reports shows that several plants have anti-inflammatory properties with significant ability to improve haematological profiles in diseased conditions (Opotu *et al.*, 2017; Olua *et al.*, 2021a; Olua *et al.*, 2021b). *Artocarpus heterophyllus* is one of such plants used by locals in treatment of several disease conditions (Keong, 2017). This study seeks to profile the hematological markers on co-administration of aqueous leaves and seeds extracts of *Artocarpus heterophyllus* on testosterone propionate induced prostatitis in male Wister rats.

II. MATERIALS AND METHODS

A. Sample collection and preparation

Fresh leaves and seeds of *Arthocarpus heterophyllus* were collected from a location in Obolo community in Mbano Local Government Area of Imo State. The leaves and seeds were identified and authenticated at the Department of Plant Science and Biotechnology, University of Port Harcourt, Rivers State. The sample were deposited at the Herbarium unit of the University of Port Harcourt with voucher number UPH1336.

B. Preparation of the aqueous extract of leaves and seeds of *Arthocarpus heterophyllus*

The leaves and seeds of *Arthocarpus heterophyllus* were washed with clean water to remove impurities. The leaves and the seeds were air dried separately and ground into powdered form with different manual blenders. The aqueous extraction was done using the cold-water method. Five hundred grams each of the powdered samples (leaves

and seeds) were mixed with two litres of distilled water in a conical flask respectively; the mixture was stirred severally and left for twenty-four hours at room temperature. The mixtures were filtered using Whatman's filter paper No 1. The filtrates were concentrated using rotary evaporator at 50°C and evaporated to dryness in an evaporating dish with a thermostat water bath heater at 50°C. The leaves and seeds extracts were separately removed from the evaporating dish using a spatula and collected into dry sterile containers. Fifty grams each of both the leaves and seeds extracts were weighed and separately dissolved in 750ml of distilled water, and after that, they were preserved in storage bottles.

➤ Experimental animals

A total of one hundred male wistar rats (100-125g) were obtained from the Animal House of the Department of Pharmacology, University of Port Harcourt, Nigeria. The hundred male wistar rats were grouped into ten groups (I-X) of 10 rats each, such that no significant difference existed in the initial mean weights of the groups and were housed individually in cages. The rats were acclimatized for seven days under standard laboratory conditions and fed ad libitum with water and Top feeds. Feeding was withdrawn at the end of acclimatization and the rats were allowed free access to only water for six hours and afterwards, the rats were weighed and reweighed after acclimatization and their weight after a week of acclimatization served as the initial weight for the experimental study.

Testosterone propionate was dissolved in corn oil and 4 mg/kg body weight was injected subcutaneously to the male wistar rats (Obisike *et al.*, 2019), while the leaf and seed extracts of *A. heterophyllus* was administered as shown below.

➤ Experimental design

The experiment was conducted in three phases of three(3) weeks each that is day 21, day 42, day 63 .

➤ *Treatment Schedule*

GROUP	Treatment	
Group 1	Normal control	Rats fed with normal feed and water
Group 2	Negative control	Rats induced with TP (4 mg/kg) and untreated
Group 3	Standard drug	(Dudesteride 4 mg/kg) Rats induced with TP(4 mg/kg) and treated with 4 mg/kg of dudesteride
Group 4	Induced 100 mg/kg leaves	Rats induced with TP (4 mg/kg) and administered 100 mg/kg of aqueous extract of <i>Arthocarpus heterophyllus</i> leaves .
Group 5	Induced 200 mg/kg leaves	Rats induced with TP(4 mg/kg) and administered 200 mg/kg of aqueous extract of <i>Arthocarpus heterophyllus</i> leaves .
Group 6	Induced 300 mg/kg leaves	Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of <i>Arthocarpus heterophyllus</i> leaves .
Group 7	Induced 100 mg/kg seeds	Rats induced with TP(4 mg/kg) and administered 100 mg/kg of aqueous extract of <i>Arthocarpus heterophyllus</i> seeds .
Group 8	Induced 200 mg/kg seeds	Rats induced with TP(4 mg/kg) and administered 200 mg/kg of aqueous extract of <i>Arthocarpus heterophyllus</i> seeds
Group 9	Induced 300 mg/kg seeds	Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of <i>Arthocarpus heterophyllus</i> seeds .
Group 10	Induced 200 mg/kg	Rats induced with TP(4 mg/kg) and administered (combined extract) 200 mg/kg of the combined (100 mg/kg aqueous leaves extracts and 100 mg/kg aqueous seeds extracts of) <i>Arthocarpus heterophyllus</i> leaves and seeds .

Blood samples were obtained by anaesthetizing the wistar rats in a jar containing cotton wool soaked in chloroform, they were then sacrificed by jugular puncture and their blood collected and stored for haematological analysis.

C. Evaluation of Haematological Indices

Haematological parameters (Hb, White Blood Cell count, Red Blood Cell count, Platelet count, Neutrophils, Lymphocytes, Monocyte (MONO), Eosinophils (EOS), Basophils (BAS) counts) and indices were assayed using Vet - Automated Haematology analyzer (Abacus junior, 1 Radim, Italy) 43. The automatic method (automatic cell counter) vet haematology analyzer was used (Abacus junior Radiun, Italy) after putting the samples on electric mixer. Each sample was estimated in triplicates.

III. DATA/STATISTICAL ANALYSIS

Statistical analysis was done using SPSS Version 21.0 to determine the one way analysis of variance (Anova), and a descriptive multiple comparison of mean values ($n=3$) @ $p \leq 0.05$.

IV. RESULTS AND DISCUSSIONS

The results of the Hematology Parameters at Day 21, 42 and 63 on co-administration of aqueous extract of jackfruit leaves/seeds and testosterone propionate on male wistar albino rats is as shown in Tables 1 to 3. The result revealed minimum PCV (%) (Hematocrit or PCV is the erythrocyte proportion of blood volume representing the ratio of red blood cells to the whole blood volume) 13.20 ± 0.21 in group 2 (Negative control - Rats induced with TP (4mg/kg) and untreated) at day 42 with maximum values 39.67 ± 0.20 seen in group 5 (induced with TP (4mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves) day 42. The PCV results from this study corroborates the findings by Soldin *et al.*, (1995) who reported PCV range for Children at ten years of age 36 - 40%, Adult female 36 - 46%, Adult male 38 - 50% . The findings however, gave results which are not significantly different from groups 1 and 3 (the control groups) (@ $p < 0.05$), but was significantly from group 2, hence revealing that the aqueous extract of *Arthocarpus heterophyllus* leaves and seeds have a stabilizing effect on PCVs in prostatic wistar rats induced with testosterone propionate. Reduced packed cell volume may suggest anemia (Zubieta *et al.*, 2007) as seen in group 2 (induced and untreated group). The finding in this study is however suggestive that testosterone administration could trigger prostatitis and co-administration

with jackfruit leaves and seed may have significant impact on PVC levels in prostatic Wister albino rats induced using testosterone propionate.

HB(g/dl) minimum 5.00±0.15 was seen in group 2 day 63 with maximum 13.23±0.39 seen in group 5 (induced with TP (4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves) day 42. This however, gave results which are not significantly different from groups 1 and 3 (the control groups) (@ p<0.05), thereby indicative of negligible effect of the various treatments on total haemoglobin in those receiving prostatitis treatment using standard drugs, however in comparison with group 2, obtained values especially from group 5 gave a significantly different result, suggestive of an antitoxic and preventive ability of the extract against TP induced prostatitis.

When erythrocytes (RBCs) (or haemoglobin) count is low, parts of the body is deficient with oxygen supply for normal cellular activities and or functions. This results to an anemic condition often times making one feel very tired. The RBC($\times 10^{12/l}$) count from this study ranged from 1.45±0.14 in groups 2 day 42 to 5.93±0.15 in group 5 (induced with TP (4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves) day 42. A normal RBC count have been recorded as men – 4.7 to 6.1 million cells per microlitre (cells/mcL) and women 4.2 to 5.4 million cells/mcL (NHS, 2019). The WBC ($\times 10^9/l$) count ranged from 4.07±0.20 in group 5 day 42 to 37.80±0.34 in group 2 (Negative control - Rats induced with TP (4 mg/kg) and untreated) day 42. Having a higher or lower number of WBC than normal indicates underlying disease condition which hence demands the need for proper mechanism to be deployed in restoring or maintaining WBC levels within the standard range.

Table 1 HEMATOLOGICAL PARAMETERS AFTER 21 DAYS ADMINISTRATION

G	P	H	R	W	Pla	Neu	Lym	Eosi	Mo
1	33	11	4.6	7.9	22	22.6	67.3	3.67	6.33
2	19	5.	1.8	24.	36	34.3	80.0	7.00	9.67
3	34	12	4.2	7.6	22	21.3	66.6	3.33	6.67
4	35	12	5.2	5.0	24	26.3	65.0	3.00	5.67
5	34	11	4.8	4.0	26	29.0	61.6	2.67	6.67
6	33	12	4.6	7.6	22	21.0	67.6	3.33	6.00
7	38	12	5.4	7.9	24	31.0	60.0	3.67	5.43
8	36	12	5.2	4.1	29	26.6	64.0	3.00	6.33
9	34	11	4.9	7.2	22	22.0	68.6	3.31	6.00
1	33	12	4.2	7.0	22	23.3	66.6	3.00	6.02

Values are means±SEM. @ n=3. Means in same column with same superscript alphabets are not significantly different @ p<0.05, while Means in same column with different superscript alphabets are significantly different @ p<0.05, With the numbers denoting; **1** - Normal control-Rats fed with normal feed and water, **2** - Negative control - Rats induced with TP (4 mg/kg) and untreated, **3** - Standard drug (Dudesteride 4 mg/kg) Rats induced with TP(4

mg/kg) and treated with 4 mg/kg of dudesteride, **4** - Rats induced with TP (4 mg/kg) and administered 100 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves. **5** - Rats induced with TP (4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves, **6** - Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves, **7** - Rats induced with TP (4 mg/kg) and administered 100 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **8** - Rats induced with TP(4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **9** - Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **10** - Rats induced with TP(4 mg/kg) and administered 200 mg/kg of the combined 100 mg/kg aqueous leaves and seeds extracts.

Table 2 HEMATOLOGICAL PARAMETERS AFTER 42 DAYS ADMINISTRATION

G	P	H	R	W	Pla	Neu	Lym	Eosi	Mo
1	34	13	5.4	8.9	24	23.2	68.1	4.64	7.34
2	13	6.	1.4	37.	33	49.3	84.2	9.00	12.6
3	35	13	4.2	7.8	23	22.0	67.4	4.31	7.67
4	35	11	4.6	7.7	24	35.9	53.3	3.33	6.47
5	39	13	5.9	7.6	20	20.3	52.3	2.10	5.33
6	34	12	5.5	9.1	24	24.0	67.1	4.67	7.67
7	33	12	5.5	9.5	22	28.3	61.6	4.00	6.00
8	37	12	5.4	11.	24	33.0	56.6	3.33	7.10
9	34	12	5.6	8.4	24	22.3	67.3	4.53	7.05
1	34	13	5.4	9.4	24	21.0	67.3	4.63	7.00

Values are means±SEM. @ n=3. Means in same column with same superscript alphabets are not significantly different @ p<0.05, while Means in same column with different superscript alphabets are significantly different @ p<0.05. With the numbers denoting; **1** - Normal control-Rats fed with normal feed and water, **2** - Negative control - Rats induced with TP (4 mg/kg) and untreated, **3** - Standard drug (Dudesteride 4 mg/kg) Rats induced with TP(4 mg/kg) and treated with 4 mg/kg of dudesteride, **4** - Rats induced with TP (4 mg/kg) and administered 100 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves. **5** - Rats induced with TP (4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves, **6** - Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves, **7** - Rats induced with TP (4 mg/kg) and administered 100 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **8** - Rats induced with TP(4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **9** - Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **10** - Rats induced with TP(4 mg/kg) and administered 200 mg/kg of the combined 100 mg/kg aqueous leaves and seeds extracts

Table 3 HEMATOLOGICAL PARAMETERS AFTER 63 DAYS ADMINISTRATION

G	P	H	R	W	Pla	Neu	Lym	Eosi	Mo
1	34	12	5.6	8.9	24	23.0	68.1	4.61	7.33
2	18	5.	1.4	34.	32	41.3	81.2	8.00	11.6
3	33	13	4.2	7.1	23	22.0	67.4	4.31	7.67
4	35	11	4.9	7.0	24	36.1	53.3	3.35	6.87
5	39	13	5.6	9.1	28	35.0	54.3	2.33	6.30
6	38	12	5.3	9.7	29	28.0	63.3	2.33	6.32
7	34	11	4.8	5.7	24	22.6	67.3	3.67	6.73
8	39	13	5.6	9.4	26	31.0	61.0	3.00	5.00
9	39	13	5.5	8.8	22	34.3	54.3	4.00	7.33
1	38	12	5.4	7.8	20	32.3	57.3	2.67	7.67

Values are means \pm SEM. @ n=3. Means in same column with same superscript alphabets are not significantly different @ p<0.05, while Means in same column with different superscript alphabets are significantly different @ p<0.05. With the numbers denoting; **1** - Normal control-Rats fed with normal feed and water, **2** - Negative control - Rats induced with TP (4 mg/kg) and untreated, **3** - Standard drug (Dudesteride 4 mg/kg) Rats induced with TP(4 mg/kg) and treated with 4 mg/kg of dudesteride, **4** - Rats induced with TP (4 mg/kg) and administered 100 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves. **5** - Rats induced with TP (4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves, **6** - Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves, **7** - Rats induced with TP (4 mg/kg) and administered 100 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **8** - Rats induced with TP(4 mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **9** - Rats induced with TP(4 mg/kg) and administered 300 mg/kg of aqueous extract of *Arthocarpus heterophyllus* seeds, **10** - Rats induced with TP(4 mg/kg) and administered 200 mg/kg of the combined 100 mg/kg aqueous leaves and seeds extracts

The WBC reference range for adults is 4.00-11.0 x 10⁹/L (MCS, 2018). The differential WBC count which is in percentage of the overall WBC count has neutrophil (55 to 73 percent), lymphocyte (20 to 40 percent), eosinophil (1 to 4 percent), Monocyte (2 to 8 percent), basophil (0.5 to 1 percent) (MCS, 2018). However, in this study Platelet(X10⁹/l) ranged from 201.33 \pm 0.09 in group 5 day 42 to 363.00 \pm 0.52 group 2 day 21, Neutrophils 20.33 \pm 0.49 in group 5 day 42 to 49.35 \pm 0.34 in group 2 day 42, Lymphocytes 52.30 \pm 0.51 (group 5 day 42) to 84.24 \pm 0.17 group 2 day 42, Eosinophils 2.10 \pm 0.57 group 5 day 42 to 9.00 \pm 0.53 group 2 (Negative control - Rats induced with TP (4 mg/kg) and untreated) day 42), Monocytes 5.33 \pm 0.32 group 5 day 42 to 12.67 \pm 0.53 in group 2 (Negative control - Rats induced with TP (4 mg/kg) and untreated) day 42). These values on multiple comparison using turkey's Post hoc test is shown not to be significantly different within the extract treated groups as well as groups 1 and 3, by remains significantly different with group 2 induced with 4mg/kg of testosterone propionate but not treated. The findings from this study shows that the treated groups gave WBC levels within the normal range, signifying that the root and seed

extracts could stabilize WBC levels in testosterone propionate induced prostatitis. However certain medication (such as : Corticosteroids, quinidine, heparin, clozapine, antibiotics, antihistamines, diuretics, anticonvulsants, sulfonamides, chemotherapy medication) . have been shown to have the ability to alter WBC levels, hence the need for a good medical approach that will help maintain these values within recommended standards (Territo, 2018) .

Eosinophils count reportedly increases in response to allergies, parasitic infections, diseases of collagen, spleen and central nervous system. They are not usually found in the blood, but abundant in the mucous membranes of the respiratory, digestive and urinary tracts (Saladin, 2012).

Obtained results however showed that leaf and seed extracts of jack fruit has a significant impact on stabilizing the hematological indices in testosterone induced prostatitis in male Wistar albino rats.

This study suggests that the extract have great ability to stimulate erythropoietin formation and secretion by the kidney and hence, presents them useful as blood boosters, that even in the face of prostatitis causing agent (testosterone) hematological parameters were still stable. No significant reduction in the blood platelets is an indicator for absence of vascular disease (Kwaan, 1992) . There was also no significant (p<0.05) decrease in white blood cell count with respect to groups 1 and 3 at all concentrations of jack fruit leaf and seed extract . The significant (p<0.05) increase in the White Blood cell count in group 2 - Negative control - Rats induced with TP (4 mg/kg) is in agreement with earlier study by Green and Flamm, (2002) that increase in WBC helps in stimulating the immune defense system and also agrees with earlier study that it may possess the ability to protect the body against infection (Green and Flamm, 2002).

The results of the Hematological Parameters at Day 21, 42 and 63 on Administration of various concentrations aqueous extract of jackfruit leaves and seeds on testosterone propionate induced prostatitis on male wistar albino rats revealed that values in most parameters are shown not to be significantly different from the control groups 1 and 3. This further shows that the leaf and seed extracts of jack fruit has significant impact on stabilizing the hematological indices in testosterone induced prostatitis in male Wistar albino rats .

This could be attributed to the high level of the anti-inflammatory phytochemical seen in the seed and leaf extracts

V. CONCLUSION

This study has shown that *Artocarpus heterophyllus* has ameliorative potentials on abnormalities of haematological indices in testosterone propionate induced prostatitis in wistar albino rats. this potentials were notable when also compared with the values obtained from the standard drug. The result also revealed that group 5 (Rats induced with TP (4mg/kg) and administered 200 mg/kg of aqueous extract of *Arthocarpus heterophyllus* leaves) and

group 10 (Rats induced with Testosterone Propionate (4 mg/kg) and administered 200 mg/kg of the combined 100 mg/kg aqueous leaves and seeds extracts), has the most potential ameliorative effect on the testosterone propionate induced prostatitis compared to other extract treated groups as well as the standard drug.

➤ *Compliance with ethical standards*

This study was done under strict compliance with the University of Port Harcourt Ethics Unit approval.

➤ *Funding*

There was no grant or sponsorship for this research from any organisations/body.

➤ *Data Availability*

The supporting data for this study are available on request from the corresponding author.

➤ *Disclosure of conflict of interest*

The authors affirm that they have no known conflicts of interest.

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