Preliminary investigation into the haematology of adult *Protopterus annectens* (Owen) in Nigeria. *(Short communication)*

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ABSTRACT:
Haematological values other than mean cell haemoglobin concentration, were consistently higher in the male *Protopterus annectens*(O) than the female. These all showed significant linear correlation with weight at 5% level ($P<0.05$) in both sexes. The low platelet count when compared with the rapidity of agglutination in this fish suggests the possession of other biochemical factor that enhances blood clotting. If useful haematological values of pathological importance, are to be established factors capable of influencing these need be investigated. Previous reports show that factors such as diets, sex, age, maturity stage, exposure to metals, etc. influence fish haematology (Fishman *et al.*, 1986; Kori – Siakpere, 1991) . The more we understand the effects of these factors, the easier for us to solve pathological problems. The present investigation, which examined the correlation between weight, sex and haematological parameters and how these could be useful in ichthyopathological studies, is intended to form a basic framework on which more fundamental research could be conducted.

MATERIALS AND METHODS

Thirty-two adult fish samples taken during the raining period from the flood plains of river Niger around Udaba –Ekperi in Nigeria were used for this study. Blood vials, containing the anticoagulant, potassium ethyl diamine tetra – acetic acid (EDTA) were used to hold blood. While packed cell volume (PCV) was determined by centrifuging blood in a microhaematocrit at 300 revolutions/min. for 5 min, the method of Larsen and Snieszko (1961) was used for haemoglobin (Hb) estimation. For total leukocyte and thrombocyte count, (WBC), blood was diluted in the ratio of 1:20 (blood: diluting fluid) the latter being made up of 0.5% acetic acid and Giemsa stain to colour it. This was used

to eliminate erythrocytes before counting in a Neubaurer improved haemocytometer with a x40 objective of a binocular microscope. Leukocyte differential count was done with oil immersion objective from slides containing Leishman stained blood smears. King (1973) equation was used to determine the mean cell haemoglobin concentration (MCHC). (MCHC = haemoglobin /PCV x 100).

RESULTS AND DISCUSSION

Personal field and laboratory observations show that female *P. annectens* (O) are much more fragile and die faster compared with the males. This ruggedness of the males could have something to do with the possession of more stable characteristics of which haematology would be one. For the same reason, females may be less able to resist conditions that would cause undue fluctuations in their blood values. If one would assume that haematological values are a function of the fish weight and sex, with a null equivalent that these are not, one could correlate these and determine significance. The present results (table I) show that male *P. annectens*(O) consistently showed higher means in all their blood characters except in MCHC. This could be the reason why males are more rugged. These values all showed significant linear correlation with weight at 5% level ($P<0.05$) in both sexes showing clearly that haematological parameters are not independent of the fish weight or sex. According to Zdenek (1977) changes in the blood composition are used in the diagnosis of pathologic conditions in fish. The present findings could, therefore, form a basis for ichthyopathological predictions.

Agglutination in this fish was observed to be very rapid. According to Lagler *et al.*, (1977), thrombocytes account for about half the leucocyte population in the fish. In view of the unusually low platelet count of this fish, the only explanation one can give for this rapidity considering the vital role of platelets in the process is that *P. annectens* (O) possibly possesses some other biochemical factor that enhances blood clotting.

Table I. Summary of haematological characteristics and correlation coefficients in re lation to sex and weight in the lungfish, *Protopterus annectens* (O). (Note that the results represent the means ± S.E.M. of five (5) replicates).

Parameters	Males		Females	
	Mean ± S.E	Range	Mean ± S.E	Range
Length (cm)	54.7 ± 8.21	39.2 - 70.0	44.5 ± 10.4	36.0 - 61.0
Weight (kg)	8.6 ± 3.67	2.75 - 17.25	5.1 ± 4.39	2.25 - 7.15
PCV (%)	36.5 ± 9.59	15.0 - 52.0	35.3 ± 6.02	32.0 - 48.0
Hb (%/g)	11.4 ± 3.00	6.25 - 16.3	11.0 ± 1.88	10.0 - 15.0
MCHC (%)	31.3 ± 0.15	31.2 - 31.3	31.3 ± 0.04	31.2 - 31.3
WBC ($x10^3mm^{-3}$)	48.5 ± 1.58	29.6 - 90.0	37.2 ± 1.38	36.0 - 40.1
Granulocyte (%)	39.2 ± 6.11	26 - 46	35.7 ± 6.37	24 - 42
Lymphocytes (%)	57.6 ± 5.89	52 - 70	61.0 ± 6.97	54 - 74
Monocytes (%)	2.8 ± 1.00	2 - 4	2.6 ± 0.98	2 - 4
Thrombocytes ($x10^3mm^{-3}$)	14.3 ± 2.11	10.7 - 28.3	2.6 ± 0.98	11.9 - 26.4
	Correlation coefficient		Correlation coefficient	
PCV – Weight	0.9299*		0.8558*	
Hb - - Weight	0.9299*		0.8561*	
WBC - Weight	0.8325*		0.7952*	

* Regression or correlation coefficient significant at $P < 0.05$ level.

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