

Haematological Profile of Indigenous Pigs in Tamil Nadu

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ABSTRACT

Indigenous pigs reserve a unique place in our genetic resource. Whole blood samples were collected from apparently healthy indigenous pigs (60 nos) reared under scavenging and semi-intensive system from different parts of Tamil Nadu to study the haematological parameters. The mean PCV (%), HB (g/dl), RBC($10^6/\mu\text{l}$), MCV(fl), MCHC(g/dl), MCH(pg), WBC ($10^3/\mu\text{l}$), Neutrophil ($10^3/\mu\text{l}$), Lymphocyte($10^3/\mu\text{l}$), Eosinophil($10^3/\mu\text{l}$), Monocyte($10^3/\mu\text{l}$) were 42.08 ± 0.85 , 10.76 ± 0.24 , 7.02 ± 0.14 , 60.01 ± 0.57 , 25.56 ± 0.21 , 15.34 ± 0.19 , 22.67 ± 0.71 , 10.87 ± 0.35 , 10.56 ± 0.32 , 0.51 ± 0.04 and 0.73 ± 0.04 respectively. There is no significant difference among sexes in all the haematological parameters analyzed. This study was carried out to present a baseline values for indigenous pigs of Tamil Nadu. These data provide valuable information for investigators using indigenous pigs as models in biomedical studies and useful physiological data for veterinarians and livestock producers.

Key words: Haematology, Indigenous Pigs, Tamil Nadu.

INTRODUCTION

Blood plays a vital role of transporting nutrients to every cell of our body and fulfills the regulatory, protective and homeostatic functions in mammals¹¹. Haematological profiles are important indicators of health and disease in both human beings as well as in animals and have been used routinely as a guide in diagnosis, treatment and prognosis of diseases¹³. Indigenous pigs reserve a unique place in our genetic resource. Mostly they have been reared in scavenging system rather than intensive system. They are the main

source of income for the rural community and also helps in improving the economic status of those rural community people. Rearing indigenous pigs in Tamil Nadu has increased in the recent past. They are widely distributed in all parts of Tamil Nadu. The total indigenous pig population in India is 7.84 million and it is 1.53 million in Tamil Nadu. There is a negative growth rate of 9.06 per cent in population size compared to previous 2007 census. Pigs are used for biomedical research and transplantation studies.

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Reference values for hematological parameters are essential for correct interpretation for health status and also for those who use indigenous pigs as a model. Determination of blood profiles reflects the physiological responsiveness of the animals to its internal and external environment⁷. Change in haematological parameters is also an important tool to access the level of stresses due to environment and nutritional factors¹⁰.

MATERIALS AND METHODS

Blood were collected from apparently 60 healthy indigenous pigs from different parts of northern Tamil Nadu to study the normal hematological profile of *indigenous* pigs of Tamil Nadu. Two ml of blood were collected in EDTA vacutainers by veni-puncture of anterior vena cava. The hematological parameters were estimated by using an automatic blood analyzer BC-2800 VET. The hematological parameters *viz.*, Red Blood Cells (RBC), Hemoglobin (Hb), White Blood Cells (WBC), Packed cell volume (PCV), Mean corpuscular volume (MCV) and Mean corpuscular hemoglobin (MCH), Mean corpuscular hemoglobin concentration (MCHC) using automatic blood analyzer. Smears for differential leucocyte counts were stained by the Leishman technique, and the different cells of leucocyte series were enumerated by the longitudinal counting method. The animals are grouped into two different groups *viz.*, males and females comprising of 30 animals in each group.

RESULTS and DISCUSSION

The mean haematological parameters of 60 indigenous pigs were presented in table I and The mean haematological profile for male and female were presented in table II. There is no significant difference among sexes in all parameters studied.

The mean PCV (%) value obtained is 42.08 ± 0.85 which is higher than the mean values of Nigerian indigenous pigs⁸, Andaman *desi* pigs and Nicobari pigs⁴ and less than the Mizoram zowavk pigs¹² and Andaman wild pigs^{3,4}.

The mean haemoglobin (g/dl) value is 10.76 ± 0.24 is higher than Andaman *desi* pigs and Nicobari pigs⁴ and is lower than the Nigerian indigenous pigs⁸, Mizoram zowavk pigs¹² and Andaman wild pigs^{3,4}.

The mean value of RBC($10^6/\mu\text{l}$) is 7.02 ± 0.14 which is greater than the Nicobari pigs and Andaman *desi* pigs⁴ and is lower than the Nigerian indigenous pigs⁸, Andaman wild pigs^{3,4} and Mizoram zowavk pigs¹².

The mean value of MCV(fl) is 60.01 ± 0.57 which is greater than Nigerian indigenous pigs⁸, and Andaman *desi* pigs⁴ and is lower than the Andaman wild pigs^{3,4}, Mizoram zowavk pigs¹² and Nicobari pigs⁴.

The mean value of MCHC (g/dl) is 25.56 ± 0.21 which is lower than Andaman wild pigs^{3,4}, Andaman *desi* pigs and Nicobari pigs⁴, Mizoram zowavk pigs¹² and Nigerian indigenous pigs⁸.

The mean value of MCH (pg) is 15.34 ± 0.19 which is greater than Nigerian indigenous pigs⁸ and is lower than Andaman *desi* pigs⁴, Andaman wild pigs^{3,4}, Nicobari pigs⁴ and Mizoram zowavk pigs¹².

The mean value of WBC($10^3/\mu\text{l}$) is 22.67 ± 0.71 which is greater than Andaman *desi* pigs and Nicobari pigs⁴, Mizoram zowavk pigs¹², Nigerian indigenous pigs⁸ and Andaman wild pigs^{3,4}.

The mean value of Neutrophil ($10^3/\mu\text{l}$) is 10.87 ± 0.35 which is greater than Nigerian indigenous pigs⁸, Mizoram zowavk pigs¹², Andaman *desi* pigs and Nicobari pigs⁴ and Andaman wild pigs^{3,4}.

The mean value of Lymphocyte ($10^3/\mu\text{l}$) is 10.56 ± 0.32 which is greater than Andaman *desi* pigs⁴ and is lower than Nicobari pigs⁴, Nigerian indigenous pigs⁸, Mizoram zowavk pigs¹² and Andaman wild pigs^{3,4}.

The mean value of Eosinophil ($10^3/\mu\text{l}$) is 0.51 ± 0.04 which is lesser than Andaman *desi* pigs and Nicobari pigs⁴, Nigerian indigenous pigs⁸ and Andaman wild pigs^{3,4}.

The mean value of Monocyte ($10^3/\mu\text{l}$) is 0.73 ± 0.04 which is greater than Mizoram zowavk pigs¹² and Andaman *desi* pigs⁴ and is lesser than Nicobari pigs⁴, Nigerian indigenous pigs⁸ and Andaman wild pigs^{3,4}.

These variations may be attributed to the local agro climatic conditions and local practices of rearing. Moreover, they are scavenging in nature. The males had higher values than the females except for MCV, MCH, WBC, Neutrophil and Lymphocyte. However higher values were also conceived with the findings of Egbunike and Akusu⁶ in 1983.

Haematological parameters are good indicators of the physiological and pathological changes in the animals^{1,9}, and are

also an excellent medium for the measurement of potential biomarkers².

These haematological parameters were very essential in judging the health status of an animal. The variation in RBC, MCH and MCV may be attributed to certain factors such as; iron deficiency, vitamin B12 and folate deficiencies, chronic haemolytic anaemia and infectious and chronic diseases eg. African trypanosomosis⁵.

Table I: Mean haematological values of indigenous pigs in Tamil Nadu

Parameters	Minimum Value	Maximum Value	Mean ± S.E
PCV (%)	26.7	66.9	42.08±0.85
HB (g/dl)	6.7	17.7	10.76±0.24
RBC(10 ⁶ /μl)	5.03	11.92	7.02±0.14
MCV(fl)	49.80	69.78	60.01±0.57
MCHC(g/dl)	16.14	27.32	25.56±0.21
MCH(pg)	9.41	18.04	15.34±0.19
WBC (10 ³ /μl)	11.3	39.8	22.67±0.71
Neutrophil (10 ³ /μl)	5.42	19.10	10.87±0.35
Lymphocyte(10 ³ /μl)	5.31	17.51	10.56±0.32
Eosinophil(10 ³ /μl)	0.23	2.17	0.51±0.04
Monocyte(10 ³ /μl)	0.34	1.99	0.73±0.04

Table II: Haematological profiles of pigs according to sex

Parameters	Mean ± S.E	
	Male	Female
PCV (%)	43.00±1.45	41.16±0.87
HB (g/dl)	11.03±0.42	10.48±0.23
RBC(10 ⁶ /μl)	7.28±0.24	6.77±0.13
MCV(fl)	59.14±0.77	60.89±0.83
MCHC(g/dl)	25.65±0.36	25.48±0.22
MCH(pg)	15.17±0.29	15.52±0.26
WBC (10 ³ /μl)	21.02±1.11	24.33±0.77
Neutrophil (10 ³ /μl)	9.97±0.54	11.78±0.39
Lymphocyte(10 ³ /μl)	9.80±0.5	11.32±0.35
Eosinophil(10 ³ /μl)	0.52±0.08	0.49±0.02
Monocyte(10 ³ /μl)	0.72±0.07	0.74±0.02

CONCLUSION

Most of them are scavenging in nature, the data obtained can also be compared to other wild species of pig. However, in the present study, blood samples were collected from the indigenous pigs which are maintained in agro climatic conditions of Tamil Nadu. Screening of health status of animals requires knowledge on the normal baseline data on various

physiological parameters. Hematological profiles are important indicators of health and disease status and have been used in disease diagnosis and treatment of many diseases. Reference values for clinical, biochemical and hematological parameters are required for data interpretation of health and disease status. Haematological values are of great diagnostic importance in practical husbandry since they

reflect the response of the animal to its environment and diseases. They can also act as useful aids to prognosis and may reveal adverse conditions even when the animal did not display obvious clinical signs of ill health. This data can be utilized as reference values for haematological examination of indigenous pig as well as in diagnosis of diseases which will ultimately facilitate in management systems and avoid the economic losses.

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