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Assessment of Haematological Profiles in Apparently Healthy Male Kombai Dogs in Theni District, Tamil Nadu

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The hematological profiles of apparently healthy male Kombai dogs in Theni district was studied in this research. Twelve male Kombai dogs had their cephalic veins venipunctured to obtain blood samples, which were then analysed. Red blood cell count, haematocrit, mean corpuscular volume, mean corpuscular haemoglobin, mean corpuscular hemoglobin concentration, and haemoglobin content were among the haematological parameters measured. The study also included a total white blood cell count, which includes eosinophils, neutrophils, lymphocytes, monocytes, granulocytes, and platelets. This information may be helpful to veterinary clinicians and biomedical researchers.

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Keywords: Kombai breed; haematological parameters; RBC count; WBC coun

1. INTRODUCTION

In veterinary medicine, reference values are necessary for a pertinent interpretation of test results. Reference values specific to the tested species and the instruments and reagents used are necessary for accurate interpretation. Many veterinary reference laboratories opt to use published or historic values because creating their own values takes time and money. The use of these factors prevents fast and correct diagnosis and perpetuates errors (Klaassen, J.K., 1999). When selecting animals that are genetically resistant to specific diseases and environmental factors (Mmereole, 2008 and Isaac et al. 2013), haematological examination is especially helpful in determining how the environment influences blood characteristics, which may have ecological and physiological implications (Ovuru, S.S. et al. 2004). Haematological traits can be used to reliably forecast an animal's physiological state (Khan, T. A., 2005). According to Waugh et al. (2005) and Bamishiyae et al. (2009), haematological parameters are those that have to do with blood and the organs that make blood.

The haematological profile must be assessed when assessing an animal's clinical health because blood serves as the body's main transport system and the input and output material for almost all metabolic activities. (Coles, 1986; Klaassen, 1999; Schalm et al, 1975; Ihedioha et al, 2004 and Ihedioha et al, 2012) Changes in the blood picture often reflect any variations from normal caused by pathogen invasion, various types of injury, deprivation, or stress. The aim of this study was to determine the haematological profile of a male Kombai dog breed that seemed to be in good health in Theni District, Tamil Nadu. Determining the haematological profile of male Kombai dogs in the Theni District of Tamil Nadu that appeared to be in good health was the goal of this study (Magesh et al. 2012).

1.1 Study Area

The study area is situated at the base of the Western Ghats and is characterised by a variety of hills and ranges. A group of hills that run parallel to the Western Ghats separate the district from Kerala State to the south. The district, which spans 2871.48 km2, is situated between latitudes 9530 and 10220 north and longitudes 77170 and 77670 east. On average, the area receives 950 mm of precipitation annually. Its temperature is nice, with highs of 40 degrees Celsius and lows of 20 degrees.

2. MATERIALS AND METHODS

Blood samples were drawn from the cephalic vein of 12 male Kombai dogs at random using a venipuncture in K3 EDTA tubes. The samples were collected and analysed in the same day. However, samples were kept at 2-8°C for transport to the test laboratory. A sample of blood was used to determine red blood cell (RBC), haemoglobin (Hb), haematocrit (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), platelet count (PLT), and white blood cell count (WBC). These parameters were tested using a haematology analyser (Exigo) that came with Dog software. To eliminate cell lysis-related mistakes, all haematological investigations were conducted within 24 hours following sampling.

2.1 Experimental Design

The study's inclusion criteria include dogs that were not taking medicine or had just finished taking it, dogs that did not have a fever or other clinical symptoms of an illness, and dogs that did not have parasite infestations according to parasitic examinations. Because the necessary population size for the study was not available, female dogs were not included.

For three months (January–March 2024), samples were taken from dogs that belonged to a private farm in Theni, Tamil Nadu, which is the breed's home tract. Dogs measuring 15–25 kg and between the ages of 1-2 years were chosen at random. The dogs' histories were reviewed, and then they had clinical and physical examinations. After determining which dogs appeared to be in good health based on the findings of physical, clinical, and parasitological investigations, the haematological profile of the canines was examined (Ogbu rt al. 2021).

The male canines, who appeared to be in good health, had their whole blood samples taken for haematological analysis at the Veterinary College and Research Institute's

Table 1. Results of haematological parameters

Haematology Parameter	Unit	Mean ± S.E
Pack cell volume	%	28.23 ± 2.59
Red blood cell count	$x10^6$ /µl	4.89 ± 0.51
Hemoglobin concentration	g/dl	11.28 ± 1.07
Mean corpuscular volume	fl	59.50 ± 0.33
Mean corpuscular hemoglobin	Pg	23.94 ± 0.39
Mean corpuscular hemoglobin concentration	g/dl	40.07 ± 0.53
White blood cell count	($\times10^3$/ µl)	14.39 ± 1.28
Lymphocyte	%	4.32 ± 0.71
Monocyte	%	1.45 ± 0.24
Neutrophil	%	9.12 ± 0.63
Eosinophil	%	0.21 ± 0.07
PLT	Lakhs	167.75 ± 13.15
MPV	fL	8.77 ± 0.24

Department of Veterinary Physiology and Biochemistry in Theni (Donato et al. 2024).

2.2 Haematology Profile

Two millilitres of blood was collected for haematology from each of the dogs by cephalic venipuncture. To prevent clotting, the blood was placed in a sample tube containing 2 mg of ethylene diamine tetraacetic acid (EDTA). Haematological parameters such as red blood cell (RBC), haemoglobin (Hb), haematocrit (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), platelet count (PLT), and white blood cell count (WBC), lymphocyte (LYM), monocyte (MON), neutrophil (NEU), eosinophil (EOS), and mean platelet value (MPV) were measured using a haematology analyser (Exigo haematology analyser) that came with software for dogs (Agradi et al. 2022).

3. RESULT AND DISCUSSION

The Mean±SE, ranges of haematological (Hb, PCV, MCH, MCV, MCHC, TEC, TLC, DLC) parameters in blood of Kombai Male Dogs are given in Table 1.

Breed, time of sample, storage impact, age, feed type, season, management techniques, and estimating methodology all affected the various normal blood contents (Swanson, 2004). The reference values listed in Dukes' Physiology of Domestic Animals, 12th edition, were in agreement with the haematological profile. Breed variances, nutritional variations, physical conditions, and metabolic status could all be responsible for the little variations in the readings.

In this study, all the haematological parameters for the male kombai dogs were within the reference intervals of the parameters already reported for dogs and used in laboratory evaluation of clinical situations.

4. CONCLUSION

Hematological parameters in apparently healthy male dogs of kombai breed show several variations in relation to breed and age. In order to assess the animals' health and physiological condition, reference values for haematological parameters must be established. It would be difficult for the lab and veterinarian to establish and use breed-specific reference intervals for individual dog breeds, but understanding how some haematological parameters change for different breeds is crucial for clinical blood value interpretation. The current study's findings deepen our knowledge of the haematology of male Kombai dogs and could be used as reference values to assist veterinarians in properly interpreting laboratory results and tracking the health of the animals to enhance management and conservation of these breeds.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

Agradi, S., Menchetti, L., Curone, G., Faustini, M., Vigo, D., Villa, L., Zanzani, S. A., Postoli, R., Kika, T. S., Riva, F., Draghi, S., Luridiana, S., Archetti, I., Brecchia, G., & Manfredi, M. T. (2022). Comparison of female Verzaschese and Camosciata delle Alpi goats' hematological parameters in the context of adaptation to local environmental conditions in semi-extensive systems in Italy. *Animals, 12*, 1703.

Bamishaiye, E. I., Muhammad, N. O., & Bamishaiye, O. M. (2009). Hematological parameters of albino rats fed on tiger nuts (Cyperus esculentus) tuber oil meal-based diet. *The International Journal of Nutrition and Wellness, 10*, 1–5.

Coles, E. H. (1986). *Veterinary clinical pathology* (4th ed.). W. B. Saunders Company.

Donato, G., Baxarias, M., Solano-Gallego, L., Martínez-Flórez, I., Mateu, C., & Pennisi, M. G. (2024). Clinical significance of blood cell ratios in healthy and sick Leishmania infantum-seropositive dogs. *Parasites & Vectors, 17*(1), 435.

Ihedioha, J. I., Okafor, C., & Ihedioha, T. E. (2004). The hematological profile of the Sprague Dawley outbred albino rat in Nsukka, Nigeria. *Animal Research International, 1*, 125–132.

Ihedioha, J. I., Ugwuja, J. I., Noel-Uneke, O. A., Udeani, I. J., & Daniel-Igwe, G. (2012). Reference values for the hematology profile of conventional grade albino mice (Mus musculus) in Nsukka, Eastern Nigeria. *Animal Research International, 9*, 1601–1612.

Isaac, L. J., Abah, G., Akpan, B., & Ekaette, I. U. (2013). Hematological properties of different breeds and sexes of rabbits. *Proceedings of the 18th Annual Conference of Animal Science Association of Nigeria*, Abuja, 8–12 September, 24–27.

Khan, T. A., & Zafar, F. (2005). Hematological study in response to varying doses of estrogen in broiler chickens. *International Journal of Poultry Science, 4*, 748–751.

Klaassen, J. K. (1999). Reference values in veterinary medicine. *Laboratory Medicine, 30*, 1–4.

Magesh, N. S., Chandrasekar, N., & Soundranayagam, J. P. (2012). Delineation of groundwater potential zones in Theni district, Tamil Nadu, using remote sensing, GIS and MIF techniques. *Geoscience Frontiers, 3*(2), 189–196.

Mmereole, F. U. C. (2008). The effects of replacing groundnut cake with rubber seed meal on the hematological and serological indices of broilers. *International Journal of Poultry Science, 7*, 622–624.

Ogbu, K. I., Ezema, K. U., Adieme, I. C., Malgwi, R. I., Sabo, J. A., Ayuba, P. N., Tion, M. T., Nguety, S. A., Atuna, S. T., Emeribe, F. O., Shallmizhili, J. J., & Anene, B. M. (2021). Determination of hemobiochemical profiles of apparently healthy exotic breed of dogs in Jos, Plateau State, Nigeria. *Open Journal of Veterinary Medicine, 11*, 226–245.

Ovuru, S. S., & Ekweozor, I. K. E. (2004). Hematological changes associated with crude oil ingestion in experimental rabbits. *African Journal of Biotechnology, 3*, 346–348.

Schalm, O. W., Jain, N. C., & Carroll, E. J. (1975). *Veterinary hematology* (3rd ed.). Lea & Febiger.

Swanson, K. S., Kuzmuk, K. N., Schook, L. B., & Fahey, G. C. (2004). Diet affects nutrient digestibility, hematology, and serum chemistry of senior and weanling dogs. *Journal of Animal Science, 82*, 1713–1724.

Waugh, A., Grant, A. W., & Ross, J. S. (2001). *Ross and Wilson anatomy and physiology in health and illness* (9th ed.). Churchill Livingstone, an imprint of Elsevier Science Limited.

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