



EFFECT OF A NEW SPECIES *Cotugnia wankhedii* Sp. NOV Cestode PARASITES ON HAEMATOLOGICAL PARAMETERS IN *Gallus gallus domesticus*

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The study deals with the haematological parameters in *Gallus gallus domesticus* (Linnaeus, 1758) which is naturally infected with new species of cestode Parasite *Cotugnia wankhedii* Sp NOV. Blood samples were collected from Host *Gallus gallus Domesticus*. Out of 20 *Gallus gallus domesticus*, 16 are infected with cestode parasite. Total number of WBC, RBC, PCV, Hb, MCV, MCH, MCHC together with absolute count of differential leucocytes (Neutrophils, Monocytes, Eosinophils, Lymphocytes and Basophils) was determined. The significant increase in Number of WBC, however reduction in the count of RBC HB, PVC, MCH in infected *Gallus gallus domesticus* as compared with Normal.

Keywords: Cestode parasite new Sp. *Cotugnia wankhedii*; *Gallus gallus domesticus*; Haematological parameters.

1. INTRODUCTION

The *G. domesticus* is provides with high nutritional and food value, due to its great food value many people of India consumed *G. domesticus* as main source of food and if the host becomes infected by cestode parasite ultimately it affects human health. After swallowing infective eggs or an intermediary host, birds with Cestode infections generate droppings of different consistency 10-12 days later. Birds that have been heavily infested frequently appear listless and apathetic with dull, ruffled plumage, weight loss, anemia, and leg weakness. Infections and other disorders may be facilitated as a result of the resultant debility.

“The present article summarized the overall results of these collections and documents new information for host-parasitic distribution of this poorly known avian cestode fauna” [1,2]. “The haematological manifestations of the infected host are suggestive of macrocytic anemia much comparable to Bothriocephalous anemia in man due to *Diphyllobothrium latum* (Cestoda) as a result of vitamin B₁₂ deficiency or related factors. The eosinophilia and lymphocytes may be believed to be associated with defensive and immunological responses of the host. Haematological studies are important in diagnosing the structural and functional status of the body. Haematology is the study of blood, and its different components”. [3,4] “Several workers have been working on haematology of birds infected

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with helminth parasites” [5,6,7,8]. “The research work carried out on the blood parameter and its alteration due to the cestode parasite *Cotugnia* [9] from the *G. domesticus* (Linnaeus) which are highly recommended for convalescing people because of its nutritional value”.

2. MATERIALS AND METHODS

2.1 Host Examination

Blood was obtained through the wing Vein and tested for parasitemia in twenty hosts (*Gallus domesticus*). The hosts (*Gallus domesticus*) were then dissected and the intestines for cestode infection were investigated. Sixteen were determined to be highly diseased and four were confirmed to be normal.

2.2 Blood Sample

“The blood collected were kept in a bottle containing anticoagulant Solution Ethylenediamine Tetra Acetic Acid i.e. EDTA. Determination of haematological parameters Red blood cell count (RBC) packed cell volume (PCV), haemoglobin (Hb) concentration, white blood cell (WBC) count and the differential leukocyte count were done by the standard procedure deserted by [10] and using the routine methods”. [11] “From the value of PCV, Hb and RBC count the mean corpuscular volume (MCV) mean corpuscular hemoglobin concentration (MCHC) were and (MCH) main corpuscular hemoglobin were estimated”.

2.3 Statistical Analysis

The level of significant differences between the mean values of the infected and control stages were determined using students t-test at p<0.05 [12]. Were all parameter calculated as:

$$MCV = \frac{PCV \times 1000}{RBC \text{ count}}$$

$$MCH = \frac{Hb \text{ Value}}{RBC \text{ count}} \text{ Express in Picoграмm's}$$

The above result obtained in *Gallus gallus domesticus*; it is clear that blood parameters either increase or decrease in the *Gallu gallus domesticus* infected with cestode parasites as compare to the normal host.

3. RESULTS DISSCUSSION

Table 1 shows significant variation in blood parameters of normal and infected *Gallus gallus domesticus* (Linnaeus). It was observed that:

- I. Statically significant decrease in RBCs count as healthy 3.4±0.7 and 2.5±0.2 infected one.
- II. A significant decrease in haemoglobin percentage as 8.6 ±0.4 normal and 7.5 ± 0.3 infected one.
- III. Haematocrit was statically significant decline in infected host such as 29.9 ± 1.4 in normal and 26.4 ± 1.2 in infected host.
- IV. The MCHC observed significant decreases in infected condition such as 28.8 ± 0.2 in normal and 28.4 ± 0.1 infected hosts. were significantly decreased (P<0.05) than those observed in the normal host,
- V. The WBCs counts recorded significantly higher in infected host than normal as 26.4± 1.7 normal and 30.2 ±3.4 infected host.
- VI. Significant decreases in MCV as 87.9 ± 14.5 in normal ,and 176± 8.9 infected one.
- VII. The infected *Gallus domesticus* shows significant increases MCH 25.3 ± .4.2 normal and 5.0±2.5 infected one values of the healthy host were lower (P<0.05) than those observed in the infected host.
- VIII. The percentage of differential leukocyte cell count showed an increase (P<0.05), particularly in lymphocyte [normal (16.5±1.3), infected (19.9±2.4)]; basophile [normal (1.83± 0.40), infected (2.66± 0.66)]; monocytes [normal (0.6±0.1), infected (0.5±0.1)]
- IX. Significant decrease in neutrophil [normal (25.51 ± 0.58), infected (17.80 ± 0.07) and eosinophil [normal (0.4±0.1), infected (0.2±0.04)] (P<0.05) in infected *Gallus gallus domesticus*, in relation to that observed in normal *Gallus domesticus*.

The findings of this study suggest that cestode parasites cause a considerable drop in the level of host in *Gallus domesticus*, especially when comparing PCV, RBC count, and haemoglobin concentration to the normal. The consequences of lowering the parameter result in anemia, which is described as a loss in the blood's ability to carry oxygen. Infected birds show restlessness, and different forms of helminths cause different sorts of alterations in hematological parameters in birds [13] "that are quite comparable to those in mammals, including humans." The similar results i.e. Increase in WBC count, MCV while decrease in RBC count from normal and

infected host also reported” [14] from albino rats infected with plasmodium parasites. as well as he suggests the physiological significance of leukocyte like their phagocytic action, release toxin globins from lymphocytes.

“In the present study, infected host showed reduced haematocrit, MCV and MCHC value. This suggests the occurrence of a microcytic hypochromic anemia. Similar result was described in infected with ectoparasites” [15].

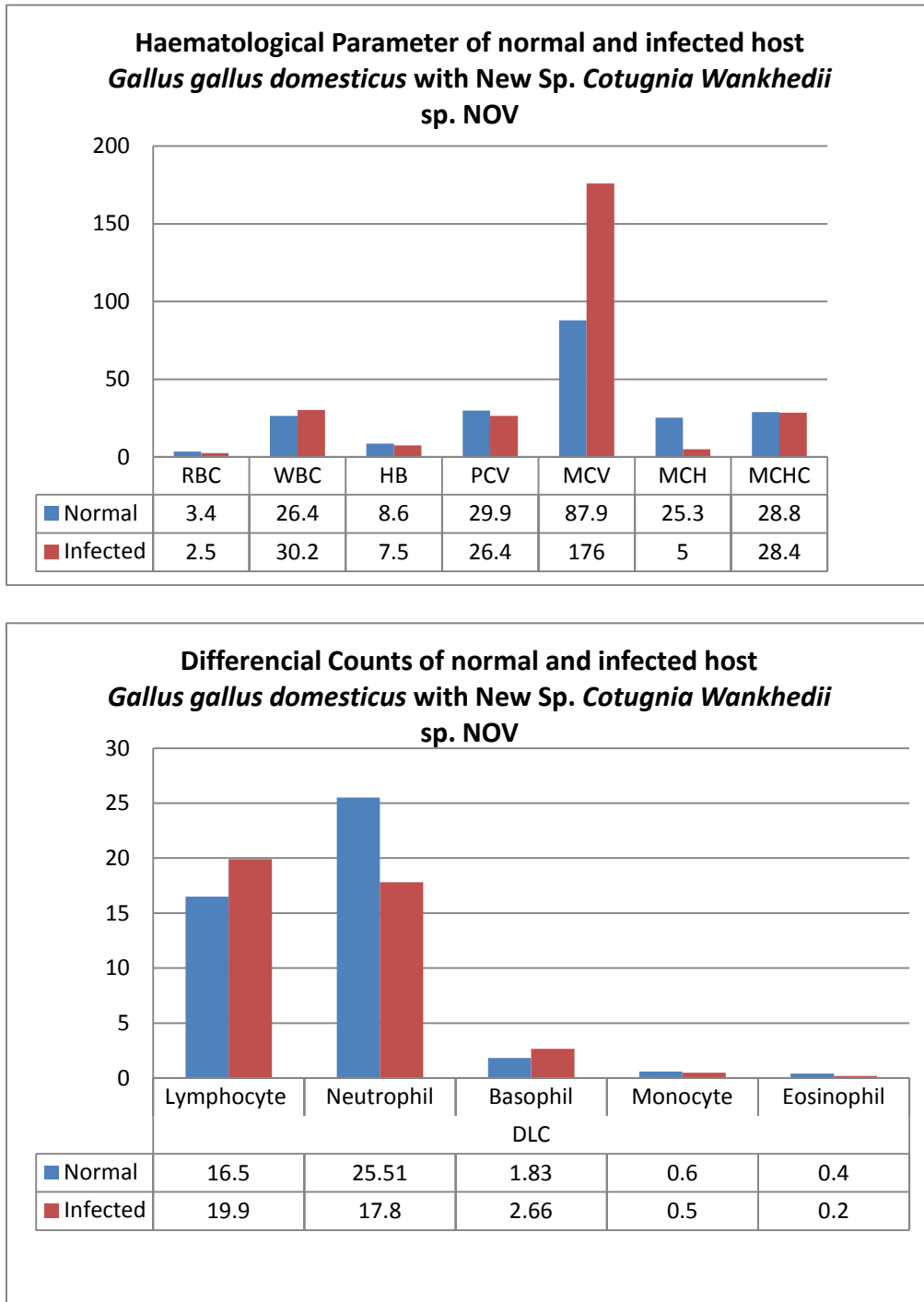


Fig. 1. Graphical representation of haematological Parameters of normal and infected host *Gallus gallus domesticus* with Cestode Parasite new Species *Cotugnia wankhedii*

Table 1. Mean haematological parameters of (*Gallus gallus domesticus*) infected with *Cotugnia wankhedii*

Haematological parameters		Normal host	Infected host
Total erythrocyte count – RBC (x 10 ⁶ /mm ³)		3.4±0.7	2.5±0.2
Total leukocyte count – WBC (x 10 ⁴ /mm ³)		26.4±1.7	30.2±3.4
Haemoglobin content – Hb (g %)		8.6±0.4	7.5±0.3
Packed cell volume – Ht (%)		29.9±1.4	26.4±1.2
	Mean Corpuscular Volume – M.C.V (μ ³)	87.9±14.5	176±8.9
	Mean corpuscular Haemoglobin M.C.H(μg)	25.3±4.2	5.0±2.5
Erythrocyte Constant	Mean Corpuscular Haemoglobin Concentration – M.C.H.C (%)	28.8±0.2	28.4±0.1
	Lymphocyte %	16.5±1.3	19.9±2.4
	Neutrophil %	25.51 ± 0.58	17.80 ± 0.07
Differential leucocyte Count (DLC)	Basophil %	1.83±0.40	2.66±0.66
	Monocyte %	0.6±0.1	0.5±0.1
	Eosinophil %	0.4±0.1	0.2±0.04

4. CONCLUSION

This study discovered that the parasite is found in *Gallus domesticus* in Aurangabd Dist, that is normally infected with cestode parasites, and that the intensity of cestode infections is responsible for changing the haematology of hosts, as well as the relationship between infection and haematological alterations. It is also possible that a lack of Vitamin B12 caused by the cestode infection will result in the development of big but few RBC. The production of anaemia, such as macrocytosis, anisocytosis, and poikilocytosis, can be seen in this type of outcome. Finally, it can be concluded that tapeworm infection causes changes in *Gallus gallus domesticus* blood parameters.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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