DIAGNOSTIC IMPORTANCE OF CYTOCHEMICAL OBSERVATIONS ON THE BLOOD CELLS OF DOMESTIC FOWL DUCK AND QUAIL

Saumya Shalini and Suresh Mehta*
Department of Veterinary Anatomy and Histology
Ranchi Veterinary College, Kanke, Ranchi-834 006, Jharkhand, India

Received on: 20.04.2021
Accepted on: 29.05.2021

ABSTRACT

The present study was conducted on blood cells of thirty healthy domestic fowl, duck and quail, ten birds of each group. The basophilic granules showed strong positive reaction in fowl while moderate in duck and weak in quail when the blood smears were stained with toluidine blue in the form of blue coloured granules. PAS reaction for glycogen was moderate in heterophil and weak in thrombocyte of fowl. The reaction was strong in heterophil and moderate in thrombocyte of duck and quail, respectively. Eosinophil of fowl and duck showed strongly positive reaction in the form of black granules for Sudan Black B while the reaction was weak in quail.

Key words: Cytochemical, leukocytes, thrombocytes, domestic fowl, duck and quail

Introduction

India being agriculture primed country. A gross share of our nation economy is contributed by animal husbandry sector. The poultry sector in India form a backyard enterprise which contributes about 16% GDP of livestock and 0.56% from all sectors. The chicken (*Gallus domesticus*) is a domesticated fowl, a subspecies of the Red Junglefowl. As one of the most common and widespread domestic animals. Knowledge of the normal haematology of the bird essential for evaluation of the health status. Cytochemical activity of different birds differs significantly with respect to species and health status. These differences in cytochemical activity in different blood cells of different birds will be helpful in disease diagnosis and exploration of forensic anatomy. In spite of large quantum of literature available on cytomorphological aspect of the avian species, the reports on cytochemical features of blood cells are meager. Few cytochemical activity have been documented in Kadaknath species however detail investigation of other cytochemical activity is meagerly available. Therefore, the present study has been carried out to explore cytochemical activity of blood cells of domestic fowl, duck and quail.

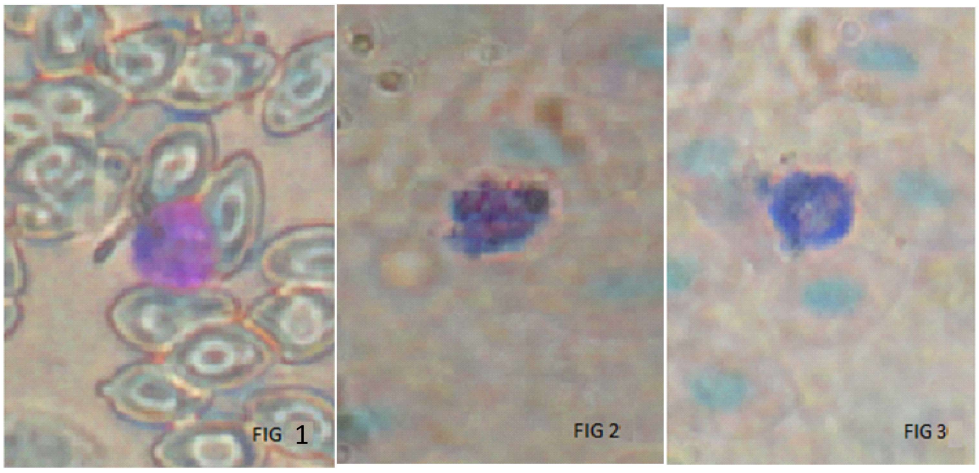
Materials and Methods

The blood samples were collected using 2 ml syringe with 22 gauze needle from wing vein of ten healthy domestic fowl and quail maintained at Department of Veterinary Anatomy and Histology, Ranchi Veterinary College, Ranchi. Immediately after collection, the blood samples were brought to the laboratory and smears were prepared on grease free slides. The blood films were stained with the different staining procedures: 1% toluidine blue stain for acid mucopoly-saccharide periodic acid Schiff's stain for glycogen (Jain, 1986) and Sudan black -B stain for lipid (Jain, 1986). The stained blood smears were examined under oil immersion to record the cytochemical activity in different blood cells of fowl and quail.

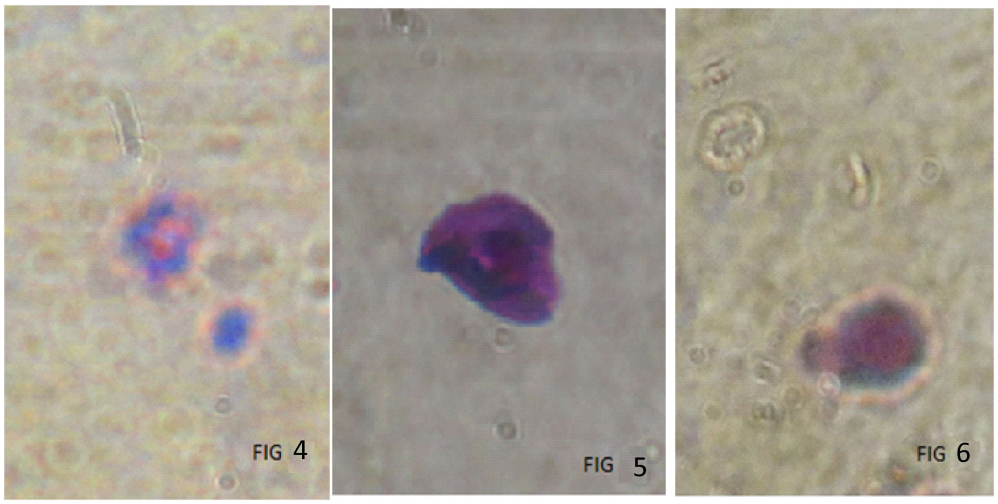
Results and Discussion

The basophilic granules showed strong positive reaction in fowl (Fig. 1) while moderate in duck (Fig. 2) and weakly positive to negative in quail (Fig. 3) when the blood smears were stained with toluidine blue in the form of violet coloured granules in fowl and duck while blue coloured in quail. Bowers *et al*. (1981) reported in a comparative study of the histochemical properties of pigeon basophils and mast cells, the pigeon basophils had only a 'trace' or no glycogen, a mucopolysachharide-glycoprotein complex, a small amount of histadin and no histamine. Yadav and S ingh (2012) reported that the granules of basophil stained metachromatically in the form of intense violet coloured with 1% toluidine blue for mucopolysaccharides in fowl. Mohd *et al.* (2015) observed that basophils were stained metachromatically in the form of intense violet coloured granules. In fowl, the heterophils and thrombocytes showed moderate positive reaction in the form of red coloured granules in the cytoplasm when the blood smears were stained with the periodic acid-Schiff stain (Fig. 4). However eosinophils (Fig. 5) and lymphocytes (Fig. 6) showed moderate positive reactivity for PAS as compared with heterophils and thrombocytes. In duck, the heterophils showed strong positive reaction in the form of orange-red granules in the cytoplasm when the blood smears were stained with the periodic acid-Schiff stain (Fig. 7) whereas lymphocytes (Fig. 8) and thrombocytes (Fig. 9) showed moderate reactivity as compared with heterophils. The eosinophils and monocyte showed negative reaction for PAS. In quail, the heterophils showed strong positive reaction (Fig. 10), lymphocytes (Fig. 11) as well as thrombocytes (Fig. 12) were moderately positive while other blood cells were negative when blood smears were stained for PAS. Contrary to this finding, Andreasen and Latimer (1990) reported that the chicken heterophil granules were negative Periodic Acid-Schiff. The present finding was also in agreement with the statement of Santos *et al.* (2003) in roadside hawk. Shigdar *et al.* (2009) stated that Periodic acid Schiff's positivity was detected in Murray cod heterophil, basophil and lymphocyte whereas monocyte and thrombocytes showed negative staining for PAS. Mohd *et al.* (2015) found that the eosinophils were showed strong positive reaction in

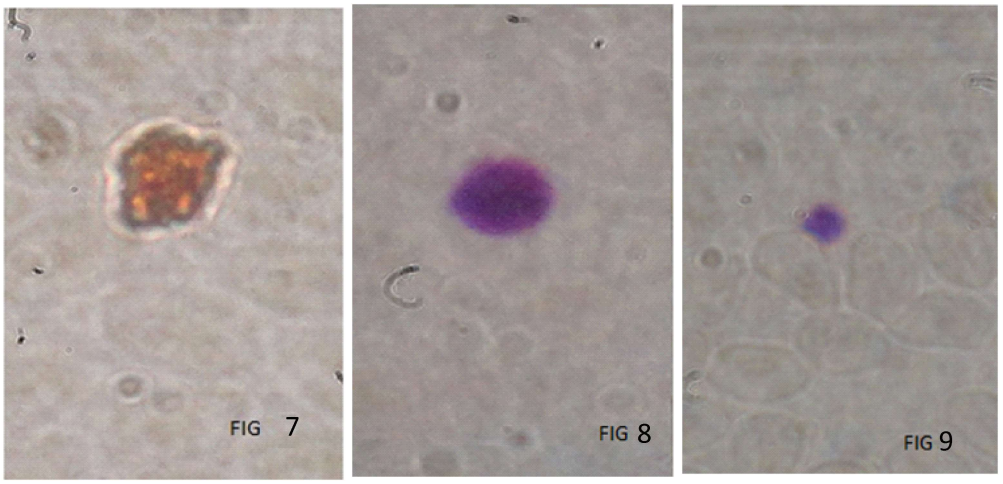
*Corresponding author email: drsureshmehtakavaya@gmail.com



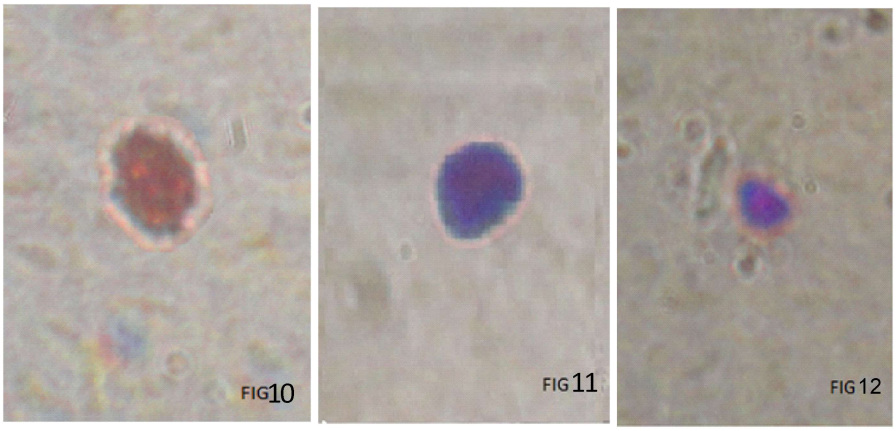
Photomicrograph of blood smear showing basophil with metachromatically stained granules of domestic fowl (Fig.1), duck (Fig. 2) and Quail (Fig. 3). Toluidine blue stain X 1000



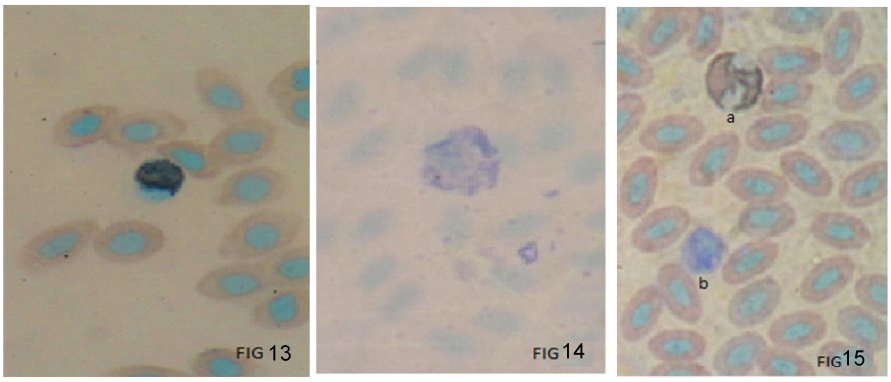
Photomicrograph of blood smear showing heterophil and thrombocyte of domestic fowl (Fig. 4) eosinophil of domestic fowl (Fig. 5) and lymphocyte of duck (Fig. 6). Periodic acid Schiff's stain X 1000



Photomicrograph of blood smear showing strong positive reacting heterophil of duck (Fig. 7), moderate positive reacting lymphocyte of duck (Fig. 8), and moderate positive reacting thrombocyte



Photomicrograph of blood smear showing strong positive reacting heterophil of quail (Fig. 10), moderate positive reacting large lymphocyte of quail (Fig. 11) and moderate positive reacting thrombocyte of quail. (Fig. 12). Periodic acid Schiff's stain X 1000



Photomicrograph of blood smear showing intense sudanophilia in eosinophil of domestic fowl. (Fig.13), palesudanophilia in eosinophil of quail. (Fig.14) and intense sudanophiliain eosinophil of duck (Fig.15). Sudan black B X 1000

the form of magenta granules in the cytoplasm with PAS. Eosinophil of fowl (Fig. 13) and quail (Fig. 14) showed strongly positive reaction in the form of black granules for Sudan Black B. Eosinophil of duck (Fig. 15) showed strongly positive reaction in the form of brownish- black granules for Sudan Black B. However, other leukocytes showed negative reaction for lipid in all three species. These above finding in fowl were in agreement with the finding of Santos *et al.* (2003) in roadside hawk. Shigdar *et al.* (2009) stated that Sudan black B staining positivity was detected in Murray cod heterophils and lymphocytes whereas basophils, monocytes and thrombocytes were negative for Sudan black B staining. The above observation was inconsonance with the statement of Yadav and Singh (2012) who reported that the eosinophil showed strong positive reaction in the form of intense black coloured granules when stained with Sudan black B. Mohd *et al.* (2015) reported that the eosinophils were strong positive reaction in black granules for Sudan Black B in the cytoplasm.

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