



Research Article

STUDY OF THE CORPUSCULAR HEMATOLOGICAL PARAMETERS RELATED TO GROWTH, DEVELOPMENT AND BEHAVIOR OF THE FERAL PIGEON

Saurabh Ranjan* and Gagan Kumar Thakur

Department of Zoology, Sido Kanhu Murmu University, Dumka, Jharkhand, India.

Article History: Received 24th July 2018; Accepted 1st August 2018; Published 17th August 2018

ABSTRACT

Humans have observed birds from the earliest times and stone age drawings are among the oldest indications of an interest in birds. Many aspects of bird biology are difficult to study in the field. These include the study of behavioral and physiological changes that require a long duration of access to the bird. Studies in bird behavior include the use of tamed and trained birds in captivity. Studies on bird intelligence and song learning have been largely laboratory based. Studies of bird migration including aspects of navigation, orientation and physiology are often studied using captive birds in special cages that record their activities. The present study was designed with the following objectives to study and analyze corpuscular hematological parameters related to reproduction, growth, development and behavior of the domestic or feral pigeon.

Keywords: Corpuscular hematological parameters, feral pigeon, Reproduction, Growth, Behavior, Feral pigeon.

INTRODUCTION

The science of ornithology has a long history and studies on birds have helped develop several key concepts in evolution, behavior and ecology such as the definition of species, the process of speciation, instinct, learning, ecological niches, guilds, island biogeography, phylogeography and conservation (Mayr, 1984). While early ornithology was principally concerned with descriptions and distributions of species, ornithologists today seek answers to very specific questions, often using birds as models to test hypotheses or predictions based on theories. Most modern biological theories apply across taxonomic groups and the number of professional scientists who identify themselves as "ornithologists" has therefore declined (Abzhanov, Protas, Grant, Grant, & Tabin, 2004; Newton, 1998). A wide range of tools and techniques are used in ornithology, both inside the laboratory and out in the field, and innovations are constantly made. Pigeon, any of several hundred species of birds constituting the family Columbidae (Order: Columbiformes). Smaller forms are usually called doves, larger forms pigeons. An exception is the white domestic pigeon, the symbol known as the "dove of peace." Therefore, the present study deals to find out

variations in corpuscular haematological parameters related to reproduction, growth, development and behavior of the domestic or feral pigeon (Fowler, 1990; Slater, 2003).

MATERIALS AND METHODS

Experimental Laboratory animal

Experiments were carried out on male and female pigeons at the Department of Zoology, S.K.M. University, Dumka, and Jharkhand after ethical approval from the department.

Experimental Protocol

Reproductive behaviour of male and female pigeons were carried out utilizing the laboratory protocols along with some experimental work

Haematological Assays

The blood samples were obtained from the venous puncture of male and female squabs for haematological assay using EDTA vials. The haematological parameters Red Blood Cell Count (RBC's), Haemoglobin percentage (HGB),

*Corresponding Author: Dr. Saurabh Ranjan, 35/c Joginder Basak Road, Kamala kunja. Flat no-3A, Third floor, Baranagar Kolkata-700036.Email: saurabhrranjan79@gmail.com, Mobile. +91 9883287515

PCV, Mean Cell Volume of RBC's (MCV), Mean Cell Haemoglobin (MCH), White Blood Cell Count (WBC's) and Differential Leukocyte counts were done manually.

Behavioural Study

The behavioural study in male and female squabs and adult pigeons were carried out.

Statistical Analysis

Results are presented as mean $\pm$ SD and total variation present in a set of data was analysed through one way analysis of variance (ANOVA). Difference among mean

values has been analysed by applying Dunnet's t-test. Calculations were performed with the Graph Pad Prism Program (Graph Pad software, Inc., San Diego, U.S.A.). The criterion for statistical significance was set at $P < 0.05$.

RESULTS AND DISCUSSION

Data of haematological parameters are shown from Figure 1-9 shows significant changes in the in the erythrocyte counts (RBCs), haemoglobin percentage, PCV levels, ESR, MCV, MCH, WBC Counts, Neutrophil counts, Lymphocyte counts in male and female squabs ($P < 0.0001$).

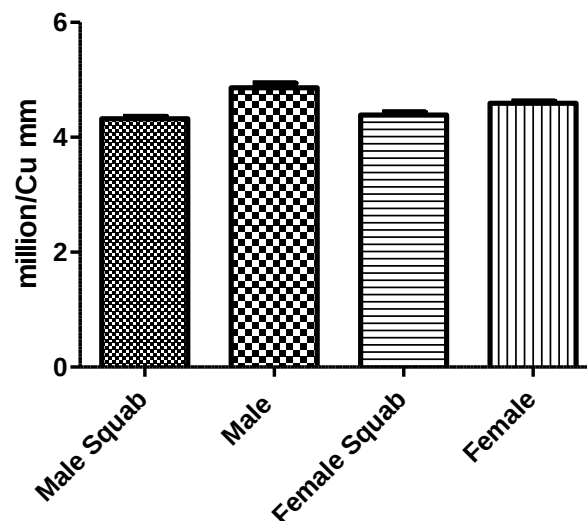


Figure 1. Total RBC counts the data are presented as mean $\pm$ SD, n = 6, significance at $P < 0.001$.

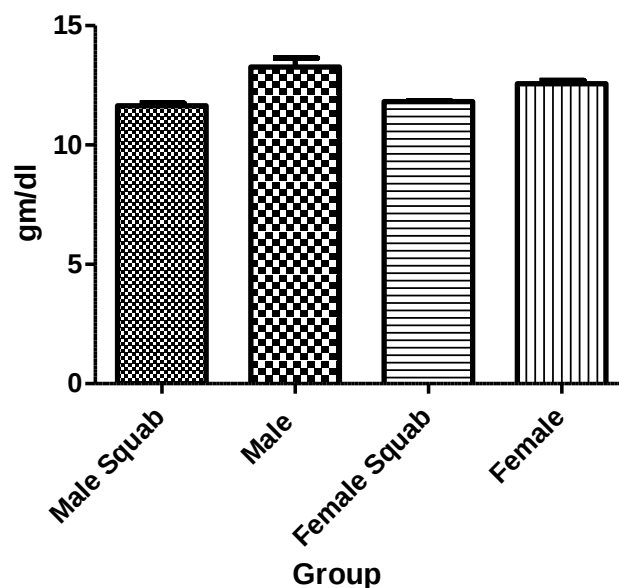


Figure 2. Haemoglobin percentage the data are presented as mean $\pm$ SD, n = 6, significance at $P < 0.001$.

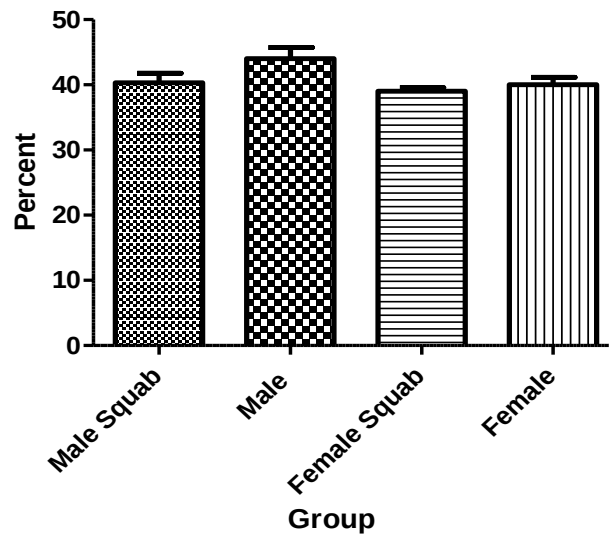


Figure 3. PCV level the data are presented as mean $\pm$ SD, n = 6, significance at $P < 0.001$.

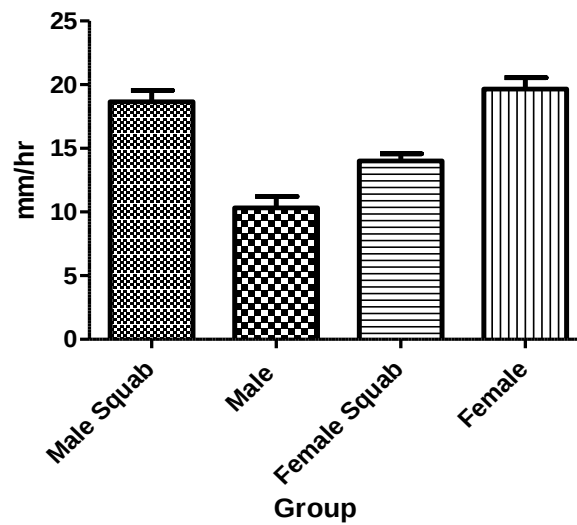


Figure 4. ESR level the data are presented as mean $\pm$ S.D, n = 6, significance at $P < 0.001$.

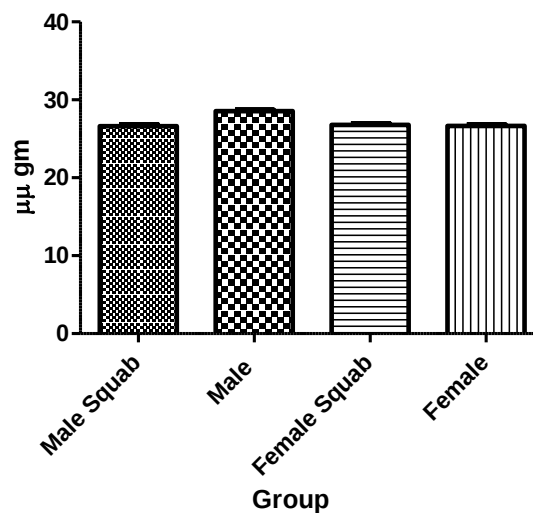


Figure 5. MCH level the data are presented as mean $\pm$ SD, n = 6, significance at $P < 0.001$.

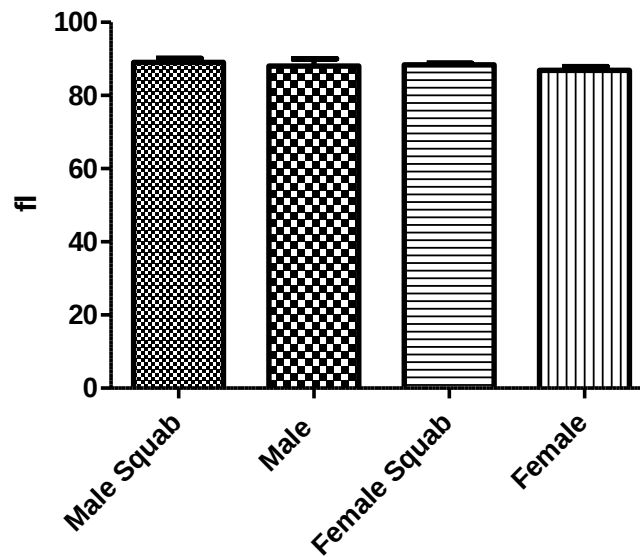


Figure 6. MCV levels the data are presented as mean $\pm$ SD, n = 6, significance at $P < 0.001$.

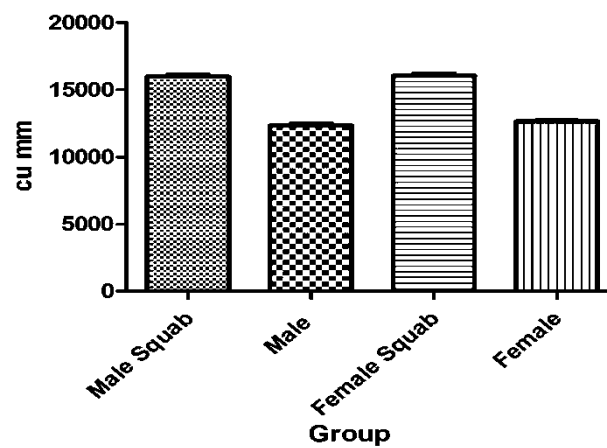


Figure 7. WBC Counts levels the data are presented as mean $\pm$ SD, n = 6, significance at $P < 0.001$.

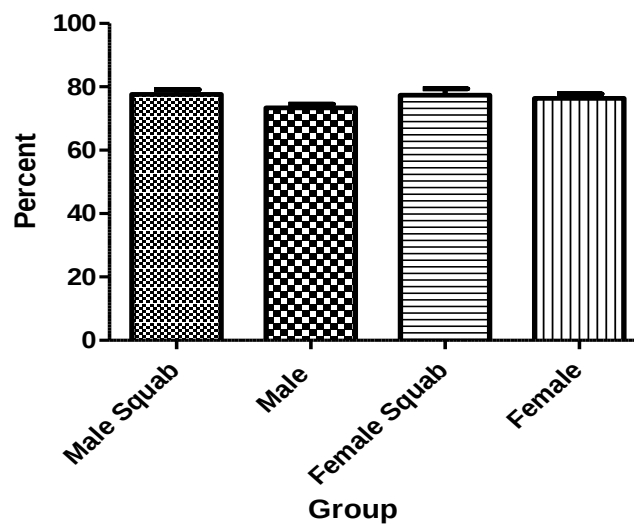


Figure 8. Neutrophil counts levels the data are presented as mean $\pm$ SD, n = 6, significance at $P < 0.001$.

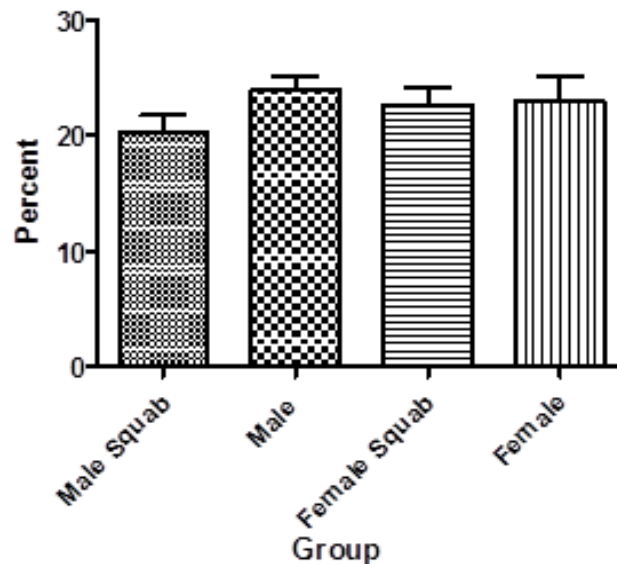


Figure 9. Lymphocyte counts levels the data are presented as mean $\pm$ SD, $n = 6$, significance at $P < 0.001$.

In the present study, the behavioural activities in male and female pigeons were carried out. Flying birds often form flocks, with social, navigational and anti-predator implications. Further, flying in a flock can result in aerodynamic benefits, thus reducing power requirements, as demonstrated by a reduction in heart rate and wing beat frequency in pelicans flying in a V-formation. But how general is an aerodynamic power reduction due to group-flight? V-formation flocks are limited to moderately steady flight in relatively large birds, and may represent a special case. Domestic Pigeons mainly eats seeds and grains. Pigeons also eat insects, fruit, and vegetation, and scavenge food people provide for them intentionally or unintentionally. Pigeons feed on open ground such as that found in parks and squares, on rooftops.

Baby pigeons, normally called squabs, require about 24 hours pecking and wiggling their way out of their egg. Those who raise baby pigeons need to allow the little squab to work their own way out of the egg, as the fight for freedom is a healthy part of their body's development and any interference can cost them their life. Once their damp downy little bodies emerge, the baby pigeon is considered to be one of the least attractive of baby birds, with large awkward eyes and almost thin floppy neck of course, as they grow up they will adapt a more visually appealing body. The investigation on "General and reproductive behaviour of Indian domestic pigeon in relation to hematology" has been specially aimed to focus on over all behavioral pattern related growth and development of the pigeon with physiological adaptations and variations in corpuscular haematological parameters.

Present research has been designed to find out variation corpuscular haematological parameters related to growth, development and behaviour of the domestic or feral pigeon. The Rock Dove (*Columba livia*) or Rock Pigeon is a member of the bird family Columbidae (doves

and pigeons). In common usage, this bird is often simply referred to as the "pigeon". The domestic pigeon (*Columba livia*) (also called the rock dove or city pigeon) was originally found in Europe, Northern Africa, and India. Early settlers introduced it into the eastern United States as a domestic bird in the 1600s (Bibby, 2003). Since then, it has expanded throughout the United States to Alaska, across southern Canada, and south into South America (Al Rawashdeh *et al.*, 2000; Allen, 1994; Au & Pitman, 1986). Pigeons originally lived in high places-cliffs, ledges, and caves near the sea—that provided them with safety. Over time they have adapted to roosting and nesting on windowsills, roofs, eaves, steeples, and other man-made structures. Feral pigeons (*Columba livia*), also called city doves, city pigeons, or street pigeons, are derived from domestic pigeons that have returned to the wild (Alodan & Mashaly, 1999). The domestic pigeon was originally bred from the wild Rock Dove, which naturally inhabits sea-cliffs and mountains. Rock (i.e., 'wild'), domestic, and feral pigeons are all the same species and will readily interbreed. Feral pigeons find the ledges of buildings to be a substitute for sea cliffs, have become adapted to urban life, and are abundant in towns and cities throughout much of the world. The species includes the domestic pigeon (including the fancy pigeon), and escaped domestic pigeons have given rise to feral populations around the world (Baker & Baker, 1973; Pulido *et al.*, 2001).

Wild Rock Doves are pale grey with two black bars on each wing, although domestic and feral pigeons are very variable in color and pattern. There are few visible differences between males and females. The species is generally monogamous, with two squeakers (young) per brood (Bonneaud *et al.*, 2008; Zanderet *et al.*, 1997). Both parents care for the young for a time. Pigeons are usually gray, but can have several color phases, including reddish-brown, tan, mottled and white. They generally have two black bars on the wing, a broad black band on the tail, a

whitish rump and red feet. Their average weight is 370 grams and average length is 28 cm. sound (Bosman & Hockey, 1986).

CONCLUSION

The present study significantly shows the haematological correlation with the behavioural changes.

ACKNOWLEDGEMENTS

The authors extend their appreciation to the Head of the Department of Zoology, S.K.M. University, Dumka

REFERENCES

- Abzhanov, A., Protas, M., Grant, B.R., Grant, P.R., & Tabin, C.J. (2004). Bmp4 and morphological variation of beaks in Darwin's finches. *Science*, 305(5689), 1462-1465.
- Al-Rawashdeh, O., Gumaa, A., Saeed, M., Orban, J., Patterson, J., & Nour, A. (2000). Effects of sucrose thermal oligosaccharide caramel and feed restriction on the performance, hematological values and cecal bacteriological counts of broiler chickens. *Acta Veterinaria (Beograd)*, 50(4), 225-239.
- Allen, D.E. (1994). *The Naturalist in Britain: A Social History*: Princeton University Press.1-254.
- Alodan, M., & Mashaly, M. (1999). Effect of induced molting in laying hens on production and immune parameters. *Poultry Science*, 78(2), 171-177.
- Au, D.W., & Pitman, R. L. (1986). Seabird interactions with dolphins and tuna in the eastern tropical Pacific. *Condor*, 304-317.
- Baker, M.C., & Baker, A.E.M. (1973). Niche relationships among six species of shorebirds on their wintering and breeding ranges. *Ecological Monographs*, 43(2), 193-212.
- Bibby, C.J. (2003). Fifty years of bird study. *Bird Study*, 50(3), 194-210.
- Bonneaud, C., Burnside, J., & Edwards, S.V. (2008). High-speed developments in avian genomics. *AIBS Bulletin*, 58(7), 587-595.
- Bosman, A., & Hockey, P. (1986). Seabird guano as a determinant of rocky intertidal community structure. *Marine Ecology Progress Series*, 247-257.
- Fowler, N. (1990). How to carry out a field investigation. *Poultry Diseases*, 370-400.
- Mayr, E. (1984). Commentary: The Contributions of Ornithology to Biology. *BioScience*, 34(4), 250-255.
- Newton, I. (1998). *Population limitation in birds*: Academic press.1-597.
- Pulido, F., Berthold, P., Mohr, G., & Querner, U. (2001). Heritability of the timing of autumn migration in a natural bird population. *Proceedings of the Royal Society of London B: Biological Sciences*, 268(1470), 953-959.
- Slater, P. (2003). Fifty years of bird song research: a case study in animal behaviour. *Animal Behaviour*, 65(4), 633-639.
- Zander, D., Bermudez, A.J., & Mallinson, E.T. (1997). *Principles of disease prevention: diagnosis and control. Diseases of Poultry*, 10th ed., Iowa State University Press, 3-45.