Blood Smear Evaluation of Bali Ducks Sampled from Traditional Farming Systems in Bali

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ABSTRACT

Research to confirm the abnormalities of blood corpuscles in Bali ducks based on blood smear examination has been conducted. The research samples consisted of 105 ducks from various regencies in Bali. The blood smear examination was conducted by the method described in this literature and the data was collected and tabulated by means of the descriptive method. Erythrocyte abnormalities were: polychromasia (61.9%), anisocytosis (17.1%), poikilocytosis (21.0%). Abnormalities associated with leukocyte composition were: Lymphopenic (46.7%); Heterophytic (44.8%); Heteropenic (3.8%), also Thrombocyto penia (2.9%) was present in 105 ducks. In conclusion 61.9% ducks examined deal with regenerative anaemia. They also have some blood abnormalities such as basophilia, eosinophilia, heterophyla, heteropenia, lymphopenia, and monocyteitis.

Key words: blood smear, ducks

INTRODUCTION

Bali is an island located in Indonesia with a land mass of 5,632 square kilometres. The island has beautiful sceneries and the Balinese people are full of harmony in their life and culture. Bali is also home to some indigenous species including Bali cattle, Bali dogs, Bali starlings and Bali ducks. Generally, the local community keeps a small flock of ducks as a secondary activity to their main agricultural activities and they are still reared in a traditional way. The ducks are not only kept for their income, but also for ceremonial or religious purposes.

Bali ducks are an ancient breed of considerable significance with some waterfowl authorities believing the Bali duck to be the originator of the Indian Runner. They are good egg layers, producing a white to blue/green egg which weighs between 60–75 grams. Compared with the general morphology of common ducks and domestic waterfowl, Bali ducks are classified as light ducks (Domestic Waterfowl Club, 2003). They are also known as penguin ducks due to their slim body and upright stance (Rasyaf, 1982). According to Baldassare and Bollen (1994), ducks in Indonesia generally belong to Anas poecilorhyncha (spot-billed duck). Bali ducks have two major phenotypes, the sumi-feathered ducks (sumi means: color looks like rice straw, brownish) and the white feathered ducks (Matram, 1984). Although in smaller numbers, there are also black color (sikep) ducks. General inspection shows that there are no other morphologically significant differences except the color of the feather.

Little information exists regarding some aspects of avian health and diseases in Bali (including Bali ducks). Even available, the information is yet to be fully established. Data from Bali Provincial Livestock Services showed that the majority of blood-associated health problems in ducks and chickens in Bali is leucocytozoonosis. (Farm Animal Data, Bali’s Provincial Livestock Services, 2002). In this research we will determine abnormalities in Bali ducks based on blood picture (Harr, 2002; Jain, 1986; Qureshi, 1988).

So, at the first, we are interested in examining peripheral blood smear of ducks to see some abnormalities regarding to blood cell morphology.
RESEARCH METHODS

This research was performed by taking 105 productive ducks (aged 8 – 10 month) were from the following 8 regencies in Bali (Badung/20 ducks, Bangli/10 ducks, Denpasar Municipal/25 ducks, Gianyar/10 ducks, Karangasem/10 ducks, Klungkung/10 ducks, Singaraja/10 ducks, and Tabanan/10 ducks) with total 53 male and 52 female ducks. A drop of blood from the wing-vein was smeared on the glass object. The blood smear was fixed in absolute methanol for 5 minutes and stained with Giemsa for 30 minutes. After completion, the stained slide was washed with distilled water and dried (Coles, 1980; Houwen, 2000; Houwen, 2001).

The blood smear examination was focused on erythrocytes with their variation in shapes and morphology, and leukocytes (Demsey and Kennedy, 1999; Phillips, 1999). Data was tabulated and analyzed by means of descriptive methods (Steel and Torrie, 1991).

RESULTS AND DISCUSSION

Examination of Blood smear

The results of the blood smear examinations are presented in Table 1. It is clear that poikilocytosis in erythrocytes/polychromasia is the biggest abnormality (61.9%), showed that the duck undergoes chronic anemia but is still responsive in nature (this responsive anemia is marked by the big number of polychromasia).

This anemia can be caused by non infectious agents such as lead poisoning, the low quality of feed, especially the protein and mineral content such as iron (Fludge, 1997). Hemoglobin abnormality can also be the cause (___, 2000).

Infectious agents such as blood parasites often causes hemolysis which in turn almost always causes hipochromic anemia, this problem will trigger polychromatophilia in erythrocytes (Papas, 2002). Research conducted by Apsari et al., (2004) seems to support this data.

The existence of poikilocytosis in erythrocytes is often reflected by abnormalities in bone marrow as a result of myelotrophic agents or infectious agents that are not intentionally carried to the bone marrow by macrophage/monocyte (Coles, 1980; Jones, 1999). Looking at the trace of the histopathological changes in some observed organs, it seems that the infectious agents mentioned above, may be dormant in the cells or tissue of ducks which appear healthy. Another change is also noticeable in the composition of white blood cells, in which heterophilia and monocyte serves as the biggest abnormality followed by leucopenia (lymphopenia). The process of chronic-active inflammation, amyloidosis and degeneration in the liver support the heterophilia and monocyte (Adi et al., 2004), and abnormalities in lymphoid system could be indicated by the presence of lymphopenia.

Table 2. Mean and standard deviation (SD) of differential leukocytes from bali ducks.

<table>
<thead>
<tr>
<th>Sex (ducks)</th>
<th>Differential leukocytes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heterophiles</td>
</tr>
<tr>
<td>Female (52)</td>
<td>63.59</td>
</tr>
<tr>
<td>SD</td>
<td>16.44</td>
</tr>
<tr>
<td>Male (53)</td>
<td>68.57</td>
</tr>
<tr>
<td>SD</td>
<td>17.29</td>
</tr>
<tr>
<td>Normal (Lane, 1996)</td>
<td>30-70</td>
</tr>
</tbody>
</table>
Figure 1. Distribution of leucocytes in 105 male and female ducks, numbers showed mean value of leucocytes.

Figure 2. Heterochromatophylic / polychro-matophylic erythrocyte in ducks’ blood (Abnormal erythrocyte’s nucleus)

Figure 3. Some abnormalities found in ducks’ erythrocytes (poikilocytosis)
Further examination such as response of cellular immune system or detection of infectious agent by polymerase chain reaction (PCR) or histochemistry need to be performed.

CONCLUSION

Even within those ducks which were clinically healthy, more than half being examined deal with regenerative anemia. They also have some blood abnormalities such as basophilia, eosinophilia, heterophilia, heteropenia, lymphopenia, and monocytosis.

RECOMENDATION

Improving feed quality is important, we suggest to give an iron supplemented feed for their ducks.

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