Haemoproteus in a Small Pigeon Flock

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Abstract.
A small flock of six pigeons (*Columba livia*), kept as companion birds, was suspected of being infected with Haemoproteus after the introduction of a new wild caught feral pigeon. One bird developed disease which was later diagnosed as *Haemoproteus* infection. Sampling of the remaining five birds revealed four positively infected birds which were subsequently cleared of infection.

Haemoproteus is a blood parasite of worldwide distribution. It is generally considered to be non-pathogenic under most situations.[1] Clinical signs attributed to infection include anaemia, hepatomegaly, splenomegaly, and pulmonary oedema. Stress and immunosuppression can result in high parasitaemias. Pigeons found with the parasite may have reduced performance. Many species of birds have been identified as having been infected. Psittacines (Cockatoos,[2] African Greys[3]), passerines (Mynahs, finches, swallows, flycatchers, tits, sparrows, canaries, warblers and thrushes[4,5,6]), Corvids, (Currawongs [7]), Columbiformes[8] and Galliformes, (Turkeys[9]).

Transmission is by insect vectors. Hippoboscid flies (Flat flies) and *Culicoides* spp.(Biting midges) have been identified as the primary vectors involved.[10]

Vector infection occurs when a vector bites an infected host ingesting sporozoites in the host's blood. The parasite undergoes three stages of reproduction to produce oocysts in the vectors intestines. These oocysts release sporozoites which migrate to the vectors salivary glands. Host transmission occurs when the vector bites another host, injecting the sporozoites into the host as it feeds. The sporozoites migrate to target organs, generally the liver, lung or spleen where they undergo two forms of reproduction (shizongony) to form male and female parasites. These are known as merozoites which enter and infect the host red blood cells. They are now called gametocytes and can be indentified as megalo- or micro- gametocytes. The six week cycle continues when these infected cells are again ingested.

Numerous drugs have been used for therapy, some of which are toxic to pigeons.[11]

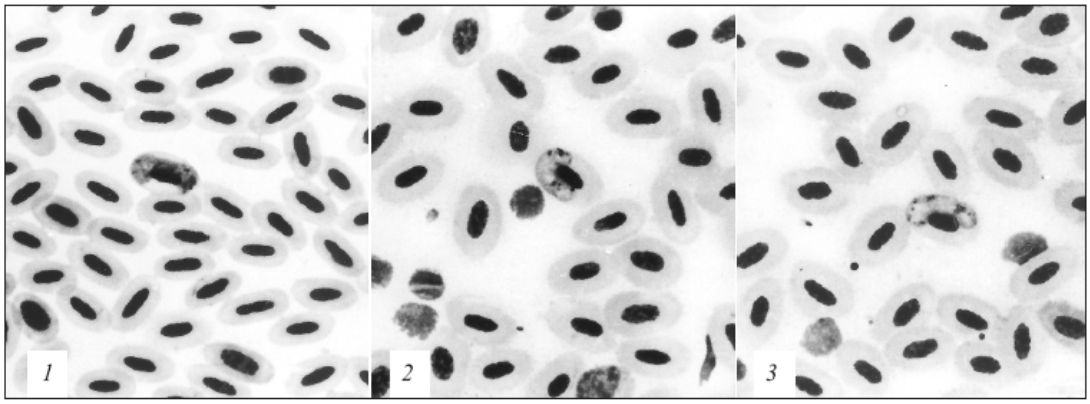

Figure 1. Macrogametocytes of Haemoproteus bucerotis from the blood of Tockus erythrorhynchus (1) and H.burhini from the blood of Burhinus capensis (2,3). dumbbell-shaped gametocyte, 2,3. Gametocytes located asymmetrically to the erythrocyte nuclei. (1,2)

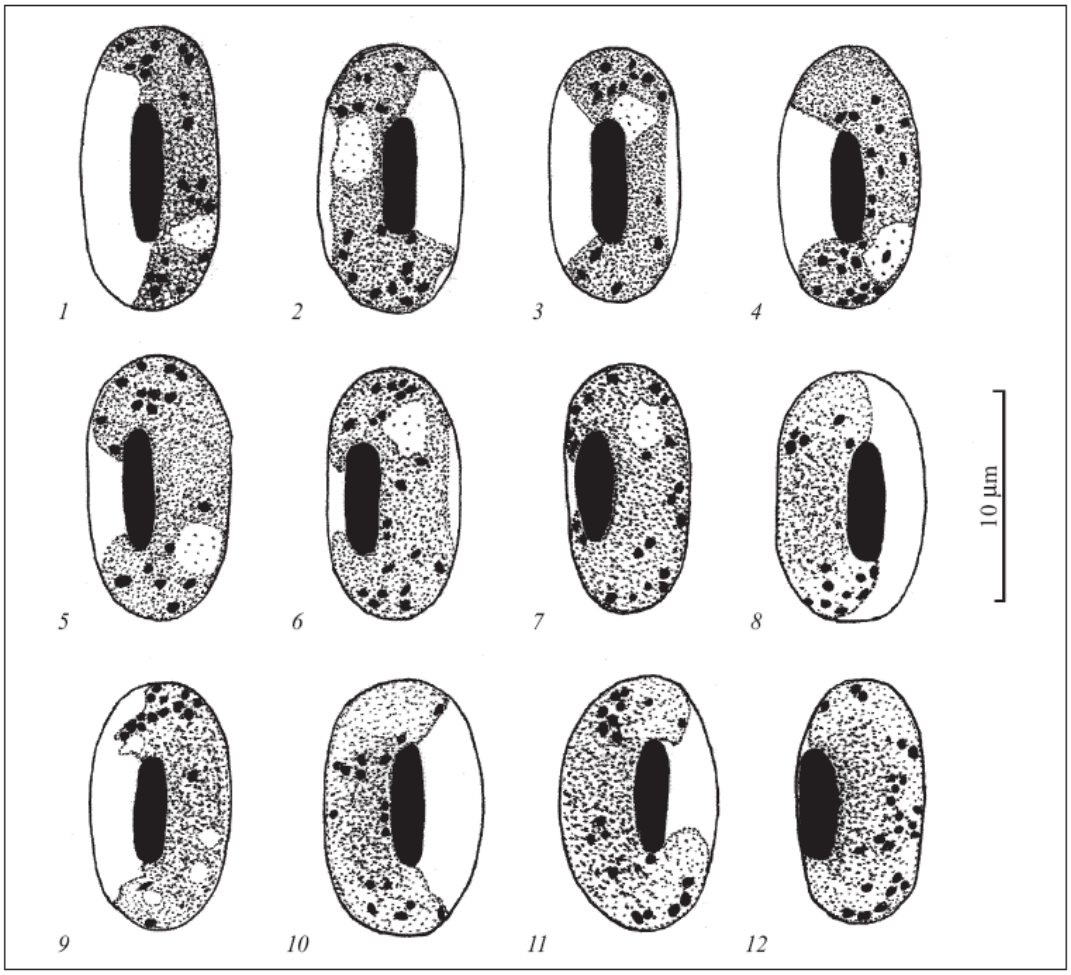

Figure 2. Gametocytes of Haemoproteus bucerotis from the blood of Tockus erythrorhynchus. 1-7 .macrogametocytes, 8-12 . microgametocytes (12)

Case Study

History.
On 01/05/2003 Harry, a six year old pigeon was presented for depression, lethargy, inappetence and breathlessness. He had been treated by another veterinarian for parasitism and had a course of antibiotics administered for respiratory disease. His condition continued to deteriorate over the next three weeks.

Clinical Signs.
Harry was reasonably bright but his feathers were dull. He had respiratory effort evidenced by mouth breathing and tail bobbing. Stools were residual and mucoid dark green. Auscultation was normal

Work up.
Faecal and crop smears were unremarkable. Faecal gram stains were within normal limits. A light isoflourane anaesthesia was administered to facilitate sampling. A jugular blood sample was obtained for biochemistry and haematology, radiography and endoscopy were performed.

Radiographic changes were hepatomegaly only. This was confirmed by endoscopy. The lungs appeared inflamed and oedematous, while the air sacs appeared normal. All other tissues appeared normal.

Biochemistry

Alb	0g/l	(6-17)
Ast	221g/l	(19-159)
Chol	4.66mmol/l	(4.73-8.76)
CK	1287u/l	(144-418)
Gluc	13.39umol/l	(12.94-24.79)
LDH	1088u/l	(277-957)
TP	16g/l	(35-50)
Uric	710umol/l	(143-524)
Glob	16g/l	

Estimated WCC was 4000x10/9

PCV 12

Intraerythrocytic haemo protozoa where evidenced in approximately four cells per high power field.

These were initially though to be *Plasmodium* spp. but later were identified as *Haemoproteus* spp.

Therapy.
Treatment was commenced immediately after diagnosis. Primaquin was administered in water and by crop gavage at a rate of 1 g per 2 litres of water. Supportive care, heat and high calorific feeding (Roudybush formula 3) were given.

Harry died after two days of treatment without any change in condition.

Autopsy findings.
Harry was in good bodily condition despite the inappetence. There was evidence of hepato/splenomegaly, lungs where as seen on endoscopy, inflamed and oedematous. All other organ tissue was visually within normal limits. No histopathology was performed.

Blood tests on the surviving six birds were recommended and on 03/05/2003 Jessie, Mandy, Reggie, Sweetie and the wild bird tested positive to Haemoproteus infection. Only Frank tested negative. All birds were asymptomatic.

Treatment with primiquin was instituted at 1g/2l in water for 28 days. All birds tested negative after therapy on 11/07/2003.

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