

MELIOIDOSIS IN A GALAH (*CACATUA ROSEICAPILLA*)

A. D. THOMAS*, J. H. NORTON* and B. W. POTT†

SUMMARY: A second case of a natural infection of melioidosis in a native bird is described. *Pseudomonas pseudomallei* was isolated in pure culture from the liver, spleen and intestinal contents of a galah (*Cacatua roseicapilla*). The case was characterised by focal granuloma formation, often associated with necrosis, in the brain, lungs, liver, spleen and kidneys.

Introduction

Birds have always been regarded as relatively resistant to melioidosis (Laws and Hall 1964). A survey in Australia (Cook 1962) showed no serological evidence of *Pseudomonas pseudomallei* in 4 species of native birds. No other studies have been reported. Recently, the first natural case of avian melioidosis was recorded in Australia (Thomas et al 1978). This paper reports a second case of infection in a native bird.

History and Clinical Signs

An adult, male galah (*Cacatua roseicapilla*) was transported by air from New South Wales to a licenced Townsville dealer. It was placed in an earthen floor aviary with a mixed flock of approximately 18 galahs and sulphur-crested cockatoos (*Cacatua galerita*). The galah was housed in this aviary for at least 2 months during the "wet" season. The floor of the aviary remained in a continuously muddy state during this period. After being sold to a pet shop, the galah was placed in a metal-bottomed cage and shared food and water with 2 other galahs until bought by a Townsville family. Within 3 days of purchase, it was lethargic, anorectic and had diarrhoea. There was no improvement in the bird's condition after 3 days and chloromycetin‡ was prescribed to be taken in the water (320mg/1 pint water). After a further 2 days with no improvement, 0.15 ml of terramycin injectable solution§ was given intramuscularly. This dose was repeated on the following day but it was obvious that the bird was dying. It was submitted to the Animal Health Station, Oonoonba on the following day in a comatose condition. White, semi-fluid faecal material was adhering to the vent feathers.

*Queensland Department of Primary Industries, Animal Health Station, Oonoonba, Box 1085, Townsville, Q 4810.

†Townsville Veterinary Clinic, 32-34 Anne Street, Aitkenvale, Townsville, Q 4814.

‡ chloramphenicol-palmitate (25mg/ml) — Palmercol, V.R. Laboratories.

§ oxytetracycline hydrochloride (lactamide base — 50mg/ml) — Pfizer.

Autopsy

The liver was enlarged. Small white to cream foci up to 1 mm in diameter were present in the spleen and both lungs. No other lesions were seen.

Histopathology

Tissue sections were stained with haematoxylin and eosin (H & E). In the lungs, there were focal granulomas with central necrotic areas in which there were numerous rod-shaped bacteria. The liver contained numerous small irregular areas of necrotic hepatic cells, often associated with a mononuclear inflammatory response. Granulomas with large numbers of foreign body giant cells were common in the spleen. A small number of granulomas were seen in the kidney. The lesions in the brain were extensive and numerous. The great majority of blood vessels in the brain were surrounded by a large zone of vacuolation in which were seen numerous rod-shaped bacteria and mononuclear cells, many of which were necrotic. The perivascular space was occupied by proteinaceous material. The meninges contained large masses of necrotic cellular material with rod-shaped bacteria surrounded by large numbers of mononuclear inflammatory cells. Gram- and Giemsa-stained sections of the above tissues confirmed the presence of long, thin Gram-negative bacteria in the brain, lungs and kidneys. These non-bipolar staining cells had an average size of 2.75 μm x 0.38 μm .

Microbiology

The liver, spleen and intestinal contents were submitted for bacteriological examination. These were cultured onto blood agar (10% citrated ovine), MacConkey agar (MA)¶, Brilliant Green agar (BGA)¶, and into Muller-Kauffmann Tetrathionate broth¶ (plus iodine and brilliant green) with the latter subcultured onto BGA the following day.

¶ Oxoid Australia P/L, Hurstville, New South Wales.

After one day's incubation at 37°C, pure cultures of a very slow-growing Gram-negative bacillus resembling *Salmonella* sp. were seen on all plates. However, after 2 days the colonies on the blood plate were grey and unwrinkled but had developed the earthy smell typical of *Ps. pseudomallei*. The colonies on the MA plates were purple and smooth. Wrinkled colonies developed on the BGA plates and these turned to yellow-green in colour. A Gram stain revealed bipolar organisms with an average size of 1.26 µm x 0.63 µm.

The isolated strains all agglutinated a known positive rabbit anti-serum to *Ps. pseudomallei*, conformed to the biochemical reactions of Cottew (1950), were pathogenic to and recoverable from guinea pigs within 2 days, and gave API20S readings of 0002004 (24 hours) and 2006725 (48 hours). These readings agreed with those of soil isolates of *Ps. pseudomallei* obtained previously in this laboratory (A. D. Thomas unpublished data).

Discussion

As *Ps. pseudomallei* has been recovered from muddy water (Laws and Hall 1964) and soil (Thomas 1977) in the Townsville area, it would appear likely that the disease was contracted from the earthen floor of the transit aviary.

In a recent laboratory case dealing with melioidosis in a sulphur-crested cockatoo (Thomas et al 1978), it was noted that the

organisms in the histological sections were long, thin and non-bipolar staining and thus not morphologically typical of *Ps. pseudomallei* as described from culture (Cottew 1950; Laws 1964) or natural cases (Rimington 1962; Laws and Mahoney 1963; Stedham 1977). The normal avian body temperature range of 40.0-43.0° with the higher temperatures being found in smaller birds (Hewitt 1962) may be a factor in this difference.

Three points of interest arise from this case. First, the appearance of long, thin, non-bipolar staining organisms in avian tissue sections should not exclude *Ps. pseudomallei* from the diagnosis. Secondly, the disease may not be as rare in birds as first thought, especially in native birds that are subjected to stress when captured and caged. Lastly, there is a human health risk involved if pet birds can contract this disease and excrete the organisms in the faeces.

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