



Alberta

Riemerella anatipestifer infection of domestic ducklings

Two groups of domestic ducklings, each from different owners, were submitted to the Animal Health Laboratories; one group in April 1996 to the laboratory in Airdrie, the other group in August 1996 to the laboratory in Edmonton. At risk were a total of 1800 ducklings, 4 and 10 wk of age. All ducklings were purchased as 1-day-old birds from 2 different sources outside the province of Alberta. At the time of submission, a total of 48 ducklings had died and 30 ducklings were sick. They were housed in outside runs with access to a pond and fed a commercially prepared ration. The producers described the ducklings as "flighty, falling back and forth and rolling onto their sides, unable to stand, and then they die." Both producers had added tetracycline to the water with little clinical benefit.

Clinically, the ducklings were severely depressed, uncoordinated, and droopy, with tremors of the head and neck. The birds had diarrhea. Postmortem examination of all ducklings revealed similar lesions. The ducklings were in moderate body condition with variable amounts of fibrin on the serosa of the heart, liver, and air sacs. In at least 1 duckling, there were gross lesions of meningitis.

Histologically, brain sections showed intense meningeal infiltrates of heterophils and fibrin exudation. There were heterophilic perivascular cuffs and moderate vasculitis within the neuropil. Interstitial infiltrates of heterophils were observed in the myocardium. Fibrin and heterophils were on the epicardium and the liver capsule. There was mild subcapsular hepatocellular necrosis. The lungs were congested. *Leucocytozoon* spp. were observed in the spleen in the 2nd group of ducklings.

Bacteriological culture of various tissues, including heart, liver, lung, and brain, resulted in the recovery of low numbers of *Salmonella hadar* in the 1st group of ducklings, and large numbers of *Riemerella anatipestifer* (formerly called *Pasteurella anatipestifer* and *Moraxella anatipestifer* (1)) from both groups of ducklings. This was the 3rd outbreak of *R. anatipestifer* infection in domestic ducks and geese identified by the microbiology section of Alberta Animal Health Laboratories since 1991.

***Riemerella anatipestifer* is important in veterinary medicine, as it is reported worldwide as the cause of epizootic infectious polyserositis of domestic ducks; it is also pathogenic for turkeys, and has been isolated from chickens, pheasants, and waterfowl. Synonyms include new duck disease, duck septicemia, anatipestifer syndrome, anatipestifer septicemia, and infectious serositis (2). Economic loss to the duck industry**

from this disease is due to mortality, with rates ranging from 5% to 75%, as well as weight loss and condemnations. Typically, ducklings of 1- to 8-weeks old are highly susceptible. Ducklings under 5-weeks old usually die 1 to 2 d after clinical signs appear; older birds may survive longer. Stress factors, such as, concomitant disease or adverse environmental conditions, predispose ducklings to outbreaks of the disease (2).

The phylogenetic classification of *R. anatipestifer* remained unsettled from 1904 until 1986. Analysis of various parameters, including DNA-hybridization, protein, and fatty acid studies in the past decade, as well as other new data, has revealed that *R. anatipestifer* differs in many ways from its closest relatives, *Flavobacterium* spp. and *Weeksella* spp. These data indicated that this organism should be assigned its own genus with the name *R. anatipestifer* (1).

The characteristics of both isolates of *R. anatipestifer* from the cases presented in this report were consistent with the following conventional identification scheme (1). The organism is a gram-negative, nonmotile, nonsporulating rod, 0.3 to 0.5 μm wide by 1.0 to 2.5 μm long. It occurs singly, in pairs, or in short chains. Smooth, grey, nonhemolytic, translucent, nonpigmented, dewdrop colonies develop in 48 h under microaerophilic conditions on peptone rich, peptone blood, or chocolate agar incubated at 36°C. Optimal growth occurs at 37°C, with most strains growing at 45°C but not at 4°C. The organism easily adapts to aerobic conditions on subculture. This nonfermenter produces catalase and oxidase; urease is usually positive (strain dependent); nitrates and indole are not produced. Most strains liquefy gelatin and hydrogen sulfide is not produced. No growth occurs on agar containing 40% bile, on citrate agar, or on MacConkey's agar. *Riemerella anatipestifer* is normally susceptible to penicillin and resistant to polymyxin B and kanamycin.

References

1. Serger P, Mannheim W, Vancanneyt M, et al. *Riemerella anatipestifer* gen. nov., comb. nov., the causative agent of septicemia anserum exudativa, and its phylogenetic affiliation within the Flavobacterium-Cytophaga rRNA homology group. Int J Syst Bacteriol 1993; 43: 768-776.
2. Sandu TS, Rhoads KR, Rimler RB. *Pasteurella anatipestifer* infection. In: Calnek BW, ed. Diseases of Poultry. 9th ed. Ames: Iowa State Univ Pr, 1991: 166-171.

Sheldon Leavitt, Microbiology Section, Mejid Ayroud, Pathology Section, Animal Health Laboratory-Airdrie, Alberta Agriculture, Food and Rural Development, Postal Service Bag #1, Airdrie, Alberta T4B 2C1.