

*Brief Communication*

CLOSTRIDIUM PERFRINGENS TYPE A TOXINS IN  
RELATION TO NEPHRITIS AND URIC ACID DIATHESIS IN  
CAPTIVE WILLOW PTARMIGAN (*LAGOPUS L. LAGOPUS*)

Large numbers of *Clostridium perfringens* type A were found in the small intestine and caeca of captive willow ptarmigan dead from nephritis and uric acid diathesis (*Hanssen* 1982). *C. perfringens* type A has been shown to cause enterotoxemia both in reindeer and lambs, and nephrosis was seen as part of the pathoanatomical picture in both animal species (*Kummeneje & Bakken* 1973, *McGowan et al.* 1958). *Niilo* (1976) showed that injections of *C. perfringens* type A enterotoxin into domestic chicken caused uric acid diathesis. On this background the present study was designed to examine if *C. perfringens* type A toxins were able to elicit nephritis and uric acid diathesis in captive willow ptarmigan.

*C. perfringens* type A crude toxin were produced by bacteria isolated from the small intestine of captive willow ptarmigan dead from uric acid diathesis (*Hanssen*). The bacteria were incubated in cooked meat medium (Difco 0267-01) containing 1 % soluble starch. The tubes were incubated anaerobically (Gas Pak System) over night at 35°C, and from the growing cultures secondary cultures were grown on the same medium by incubating for 6 h. The cultures were then chilled and centrifuged to remove all particulate matter. The pH of the supernatant fluid was adjusted to 7.0, and toxicity was tested by intravenous injections on mice. Minimum lethal dosis for mice were 0.05 ml, and doses of 0.15–1.00 ml were injected intravenously into 9 captive willow ptarmigan.

*C. perfringens* type A strain NCTC 8239 was used for production of enterotoxin in Duncan and Strong sporulation medium (*Duncan & Strong* 1968). The enterotoxin was purified by a modification (*Granum & Skjelkvåle* 1977) of the method described by *Sakaguchi et al.* 1973.\* Enterotoxin was diluted in sterile 0.9 % NaCl solution (0.5 mg/ml) and injected intravenously in 0.1–0.2 ml volumes to 8 ptarmigans.

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\* Enterotoxin was provided by Dr. R. Skjelkvåle, Norwegian Food Research Institute.

The ptarmigans used were reared as described by *Hanssen*. A single dose of 0.2 ml crude toxin injected intravenously was lethal to willow ptarmigan, which died within 24 h. Repeated intravenous injections of 0.15 ml every second day were tolerated over a 7 days period. At necropsy blood congestion in large veins and swollen kidneys were observed. Uric acid diathesis were not seen.

A single dose of 50 µg enterotoxin was shown to be lethal within 24 h. At necropsy blood congestion were found in the large veins in all birds. One bird showed hemorrhagic enteritis, and another moderate urate precipitations in the kidneys. These results indicate that ptarmigan nephritis and uric acid diathesis are not *C. perfringens* type A enterotoxemias.

*Ingolf Hanssen*

The Department of Arctic Biology and Institute of Medical Biology, University of Tromsø, Norway.

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Reprints may be requested from: Ingolf Hanssen, Steinåsen 33, N-7000 Trondheim, Norway.