# THE INEFFECTIVENESS OF ACID-FAST INCLUSIONS IN DIAGNOSIS OF LEAD POISONING IN CANADA GEESE

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# BRIEF NOTES, SURVEYS AND COMMENTS

## THE INEFFECTIVENESS OF ACID-FAST INCLUSIONS IN DIAGNOSIS OF LEAD POISONING IN CANADA GEESE

The occurrence of acid-fast intranuclear inclusion bodies in the cells of the proximal convoluted tubules of mallards fed lead shot was recently reported by Locke et al. (Bull. Wildl. Dis. Assoc. 2:127-131, 1966) and these authors suggested that the kidneys of birds suspected of dying from lead intoxication should be examined.

Kidney tissues have now been examined from Canada geese *(Branta canadensis)* succumbing to lead poisoning in two separate outbreaks. The frequency of occurrence of acid-fast intranuclear inclusions in these birds was quite low.

In a die-off at Prime Hook National Wildlife Refuge, Delaware, in which coccidiosis and lead poisoning both were involved, acid-fast inclusions were found in the kidneys of only one of three geese although all had significant levels of lead in the liver (greater than 9 ppm wet weight) (Locke and Bagley, Chesapeake Science 8(1): 68-69, 1967).

In December 1966 a die-off of about 600 Canada geese occurred at Fox Lake, Wisconsin, and 8 geese were submitted to the Patuxent Wildlife Research Center for necropsy. The results of laboratory examination are summarized in Table 1.

In all cases the inclusion bodies that were found were very small, and took the acid-fast stain only faintly. Prolonged searching with the oil immersion lens (1250X) was necessary to locate the few inclusion bodies present. Goose #3 and Goose #5 had only three and four nuclei, respectively, containing acid-fast intranuclear inclusions (in 100 consecutive oil immersion fields examined).

The lead content of the liver of each of these geese is higher than the lowest value reported by Cook and Trainer (J. Wildl. Mgmt. 30:1-8, 1966) for their experimentally poisoned Canada geese.

It thus appears that birds, particularly Canada geese, receiving a large exposure to lead may succumb without the formation of intranuclear acid-fast inclusions in the kidneys. The authors believe that a period of exposure of several days is required before the bird can respond by producing these inclusions.

Definite diagnosis must be based on a chemical analysis of the tissues. However, when present, the acid-fast intranuclear inclusions are a useful aid in the diagnosis of exposure to lead.

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TABLE 1. *Results of Laboratory Examination of Canada Geese from Fox Lake, Wisconsin*

| Goose No. | Number of Shot Present | Acid-fast Inclusion Present | Lead in Liver, ppm Wet Weight |
|---|---|---|---|
| 1 | 44 | + | 37 |
| 2 | 19 | — | 19 |
| 3 | * | + | 20 |
| 4 | * | — | 12 |
| 5 | 20 | + | 34 |
| 6 | 40 | + | 44 |
| 7 | 19 | — | 15 |
| 8 | 30 | + | 30 |

* Gizzard opened and shot removed before examination at Patuxent Wildlife Research Center.