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Avian Tuberculosis in Wild Birds in the Netherlands

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ABSTRACT: *Mycobacterium avium* was isolated from 82 of 11,664 birds submitted for necropsy in The Netherlands. All isolated *M. avium* strains belonged to serotype 1, 2 or 3. The greatest number *M. avium* were from buzzards and falcons. The prevalence of tuberculosis in gulls is extremely low.

Key words: Diseases of wild birds, tuberculosis, *Mycobacterium avium*, prevalence, Netherlands.

Tuberculosis in poultry has been known in The Netherlands since 1929 (van Heelsbergen, 1930; Jansen, 1936; Huitema and Van Vloten, 1959). Tuberculosis has been eradicated from modern commercial poultry farms, but it is present in wild birds in The Netherlands. Robijns (1960) examined 1,069 gulls and gull droppings and found a prevalence of 19% in the province of Zeeland, while in the province of Noord-Holland only 1 of 316 gulls were infected. Tuberculosis also occurs in wild birds in Germany and Austria (Gratzl and Köhler, 1968) and in England (McDiarmid, 1948; Bucke and Mawdesly-Thomas, 1974). This paper provides more extensive data on the prevalence of avian tuberculosis in wild birds from The Netherlands.

Birds examined in this study were sent for autopsy by ornithologists, State Forestry Department wardens, bird protection organizations and amateur bird watchers. The cause of death was determined by necropsy and virological, bacteriological, parasitological and toxicological examinations.

The material examined for tuberculosis became available from the normal diagnostic routine control tissues collected from these birds. In those cases where tuberculosis was suspected, tissues were microscopically, culturally and histologically examined. Initial isolation was performed on Löwenstein-Jensen and Middlebrook 7H10 media. Several biochemical tests were used to obtain reliable identification (Wayne, 1984) and serotyping was carried out according to Schaefer (1965). The final diagnosis of tuberculosis was based on positive results from cultural and serological tests.

Mycobacterium avium was isolated from 82 of 11,664 wild birds (25 species) examined from 1975 to 1985 (Table 1). The isolated strains of *M. avium* were serologically typed according to Schaefer (1965). Twenty-five of 82 cases were not serotyped. There were 5, 45, 1, and 6 cases with serotype 1, serotype 2, serotypes 1 and 2, and serotypes 2 and 3, respectively.

In six cases, a mycobacterium other than *M. avium* was isolated. The isolation of *M. fortuitium* (three cases) and *M. terrae* (one case) in three buzzards (*Buteo buteo*) were considered incidental. One bird died from poisoning while the other buzzards were presumably foot-trapped and exhausted. All the buzzards showed inflammation of the claws. A black-headed gull (*Larus canus*) with an intestinal infection of *M. nonchromogenicum* was in good condition. A few granulomas were found in the intestines. A jackdaw (*Corvus monedula*) from which *M. fortuitium* was isolated showed inflammation of beak and feet, resembling avian poxlesions. Necrosis in the liver and spleen was found in a pheasant (*Phasianus colchicus*) from which *M. flavescens* and *Mycobacterium* sp. (runyon group 4) were isolated. The pathological and epizootiological significance of these

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TABLE 1. The occurrence of *Mycobacterium avium* in dead wild birds found in The Netherlands, 1975–1985.

		Numbers of birds	
		Examined	Infected
Great crested grebe	*Podiceps cristatus*	76	1
Spoonbill	*Platalea leucorodia*	11	1
Swans	*Cygnus columbianus, Cygnus olor*	179	3
Brant goose	*Branta bernicla*	43	1
Shelduck	*Tadorna tadorna*	64	2
Smew	*Mergus albellus*	2	1
Sparrowhawk	*Accipiter nisus*	302	1
Buzzard	*Buteo buteo*	970	20
Merlin	*Falco columbarius*	7	1
Kestrel	*Falco tinnunculus*	450	17
Pheasant	*Phasianus colchicus*	85	2
Coot	*Filica atra*	367	2
Oystercatcher	*Haematopus ostralegus*	95	1
Ruff	*Philomachus pugnax*	12	1
Gulls	*Larus ridibundus, Larus canus*	1,048	11
Pigeons	*Columba palumbus, Columba oenas*	145	4
Little owl	*Athene noctua*	155	1
Tawny owl	*Strix aluco*	131	4
Long-eared owl	*Asio otus*	313	3
Short-eared owl	*Asio flammeus*	23	1
Jackdaw	*Corvus monedula*	103	3
Siskin	*Carduelis spinus*	80	1
Total number of birds examined		11,664	82

Mycobacterium spp. in these avian species remain undetermined.

The chance that a bird is sent to our laboratory depends on its chance of being found and the importance of a diagnosis to the finder. Gulls become important only when several birds are found, whereas even a single dead or sick raptor always seems to be important. The average number of birds submitted in a shipment was 3.0 gulls and 1.2 birds of prey. However, mortality by tuberculosis appears incidental. The prevalence of tuberculosis in gulls is apparently far less than reported previously (Robijns, 1960).

Although our data are limited, there seems to be a difference in prevalence of *M. avium* between avian families in one taxonomic group and also between several species in a family (Table 1). The reasons for these differences are unclear. There seems to be no large variation in behavior and feeding patterns between the infected and the non-infected species of a particular family. However, in raptors there are marked differences in agonistic behavior between accipiter species, falconiformes and buteos. Accipiters usually fight in the air without incurring injuries while buzzards and falcons fight on the ground often with heavy body contacts (Kirkwood, 1980). Kestrels (*Falco tinnunculus*) show aggressive behavior at the nest site and buzzards will fight because of prey kleptomania. The subdominant bird is sometimes turned over on its back while the dominant bird attacks with its claws supported on tail and wings. While performing postmortem examinations we found that buzzards and kestrels, in contrast to goshawks and sparrowhawks, often showed infected local injuries on neck, breast and limbs. The injuries we found in the buzzard were usually situated on the legs. The

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lesions on the kestrel were spread over the entire front and ventral surface of the bird. We isolated *M. avium* from a number of these lesions. Five buzzards and six kestrels had tuberculosis-infected wounds. Tuberculosis of the internal organs was detected in two of the buzzards and three of the kestrels with tuberculosis-infected injuries. In view of the choice of prey, especially mice, it is not very likely that local injuries in the kestrel are caused by prey induced injuries.

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