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## THE OCCURRENCE OF GAPEWORM (*Syngamus trachea*) IN WILLOW GROUSE

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**Abstract:** 21.4% of the willow grouse (*Lagopus lagopus*) examined from a coastal locality in northern Norway were infected with *Syngamus trachea*. None of the willow grouse examined from an inland locality with colder and longer winters were infected with the parasite. It is suggested that the parasite may influence survival of the grouse population.

### INTRODUCTION

The nematode *S. trachea* parasitizes the trachea of a large number of bird species.<sup>6</sup> The infection causes the so-called gapeworm disease well known in poultry.

Gapeworms have been recorded from wild birds in Norway including capercaillie (*Tetrao urogallus*),<sup>4</sup> black grouse (*Lyrurus tetrix*),<sup>5</sup> magpie (*Pica pica*), house sparrow (*Passer domesticus*), arctic tern (*Sterna paradisaea*), and fieldfare (*Turdus pilaris*).<sup>1</sup> In the cases reported by Bakke<sup>1</sup> only one to three infected birds of each species were recorded.

Bakke noted that all known cases of gapeworm infection in birds in Norway were from the southern and western part of the country, and he suggested that the distribution of *S. trachea* is restricted to these areas for climatic reasons.<sup>1</sup>

We have found *S. trachea* in a population of willow grouse in northern Norway.

### MATERIAL AND METHODS

Willow grouse were collected from one island locality (Karlsøy, approx. 9° E, 70°N) and one inland locality (Sennaland, approx. 10°E, 70° 10'N).

The main climatic difference between the coast and the interior is a colder and

longer winter in the interior. In 1972 Solovomi near Sennaland had monthly average temperatures below 0C from January to April and from October to December. Monthly averages below 0C in Tromsø near Karlsøy were recorded from January to March and in November. The lowest monthly average temperature at Solovomi was -15.9C and in Tromsø -2.4C, both in February.

On Karlsøy samples of grouse were collected monthly from July to December 1973 and from Sennaland the sampling period included September, October and November of the same year. Most of the adult grouse were obtained by shooting, while chicks were collected by a variety of methods. The birds were deep frozen as soon as possible after being killed and were examined for helminths later.

### RESULTS

From the inland locality (Sennaland) 48 willow grouse were collected in September, 12 in October and 5 in November. None of these birds were infected with gapeworms.

Of the 70 willow grouse examined from the island locality (Karlsøy) 15 (21.4%) were infected with from 1 to 23 pairs of *S. trachea*. Only chicks and young birds were infected, and only birds collected in July, August and September (Table 1).

TABLE 1. The prevalence and intensity of infection with *Syngamus trachea* in willow grouse from the island Karlsøy.

Month	Number of grouse examined	One year or older		Older than 28 days		28 days or younger		Total prevalence of infection	Percent Intensity of infection Pairs of <i>S. trachea</i>
		Examined	Infected	Examined	Infected	Examined	Infected		
July	9	1	0	4	4	4	2	66.7	6.1 (1-23)
August	10	—	—	10	7	—	—	70.0	3.4 (1-7)
September	18	2	0	16	2	—	—	11.1	1.0 (1)
October	12	1	0	11	0	—	—	0	
November	13	3	0	10	0	—	—	0	
December	8	3	0	5	0	—	—	0	

## DISCUSSION

Our observations show that *S. trachea* is endemic in a coastal locality in northern Norway and thus not restricted to southern parts of the country for climatic factors. The absence of the parasite in grouse samples from an inland locality in the north may however be caused by the more severe winters in that locality.

The life cycle of *S. trachea* may include an invertebrate transport host in which the parasite may live for a considerable length of time.<sup>7</sup> According to Barth<sup>2</sup> insects are an important part of the diet of willow grouse during the first 2 weeks after hatching. Most of the

willow grouse eggs on Karlsøy hatched in 1973 during the last week of June and the first week of July (Parker pers. comm.) Barus<sup>3</sup> showed that *S. trachea* may live from 48 to 108 days with a mean life of 72 days in the final host. Based on these data one would expect a decrease in the gapeworm infection in grouse on Karlsøy around mid-September. The decrease and disappearance of the infection in the material examined appear more abrupt than one would expect from the life data of the parasite alone, and indicate that *S. trachea* may influence survival in this population of willow grouse.

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