

Prevalence of *Anaplasma phagocytophilum* in *Ixodes ricinus* Ticks from Northern Norway

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***Anaplasma phagocytophilum* was found at a prevalence of 3.0% in *Ixodes ricinus* collected at the ticks' northern distribution limit in Norway. This is the first report on *A. phagocytophilum* occurrence in ticks collected north of the Arctic Circle.**

Introduction

Anaplasma phagocytophilum is regarded as an emerging tick-borne pathogen [1]. The bacterium is transmitted by *Ixodes* ticks, and it is a well-known pathogen in veterinary medicine. However, the importance of *A. phagocytophilum* as a human pathogen in Europe is still uncertain. Human granulocytic anaplasmosis has been reported from southern Norway and there is serological evidence both in humans and in livestock of *Anaplasma* endemicity [2,3]. Serological findings in cattle have indicated the presence of *A. phagocytophilum* in Nordland county in northern Norway [4], and the bacterium has also been detected in blood samples from cattle, as well as in ticks, collected in Brønnøysund (latitude 65° 28' N) [5].

Aims

We aimed at extending previous studies at the ticks' northern distribution limit and to investigate the prevalence of *A. phagocytophilum* in *Ixodes ricinus* ticks in the region adjacent to the Arctic Circle in Norway.

Methods

During 2009-2011, a total of 765 *I. ricinus* ticks was collected from dogs and cats visiting veterinary clinics in the three northernmost Norwegian counties of Nordland, Troms and Finnmark (n=669) as well as in the county of Telemark in southern Norway (n=96). The prevalence of *A. phagocytophilum* in the ticks was analysed by TaqMan real-time PCR. Statistical comparisons were done by using the chi-square test.

Results

The overall prevalence of *A. phagocytophilum* in the collected ticks was 2.9% (Table 1). There was no significant difference in *A. phagocytophilum* prevalence between ticks from dogs and ticks from cats (p=0.46). Of the ticks collected in the three northernmost counties in Norway, 3.0% were positive for *A. phagocytophilum* (Nordland 2.8%, Troms 9.0%, Finnmark 0%). Of the ticks collected in Telemark county, 2.1% were positive for *A. phagocytophilum*. There was no significant difference in prevalence of *A. phagocytophilum* in ticks collected in northern Norway compared to ticks collected in Telemark county (p=0.63) (Figure 1).

	No. of ticks	No. of ticks from dogs	No. of ticks from cats	No. of <i>A. phagocytophilum</i> -infected ticks
Finmark	0	0	0	0
Troms	22	10	12	2
Nordland	647	361	286	18
Total Northern Norway	669	371	298	20
Telemark	96	92	4	2
Total	765	463	302	22

Table 1. Collected ticks, their origin and prevalence of *Anaplasma phagocytophilum*.

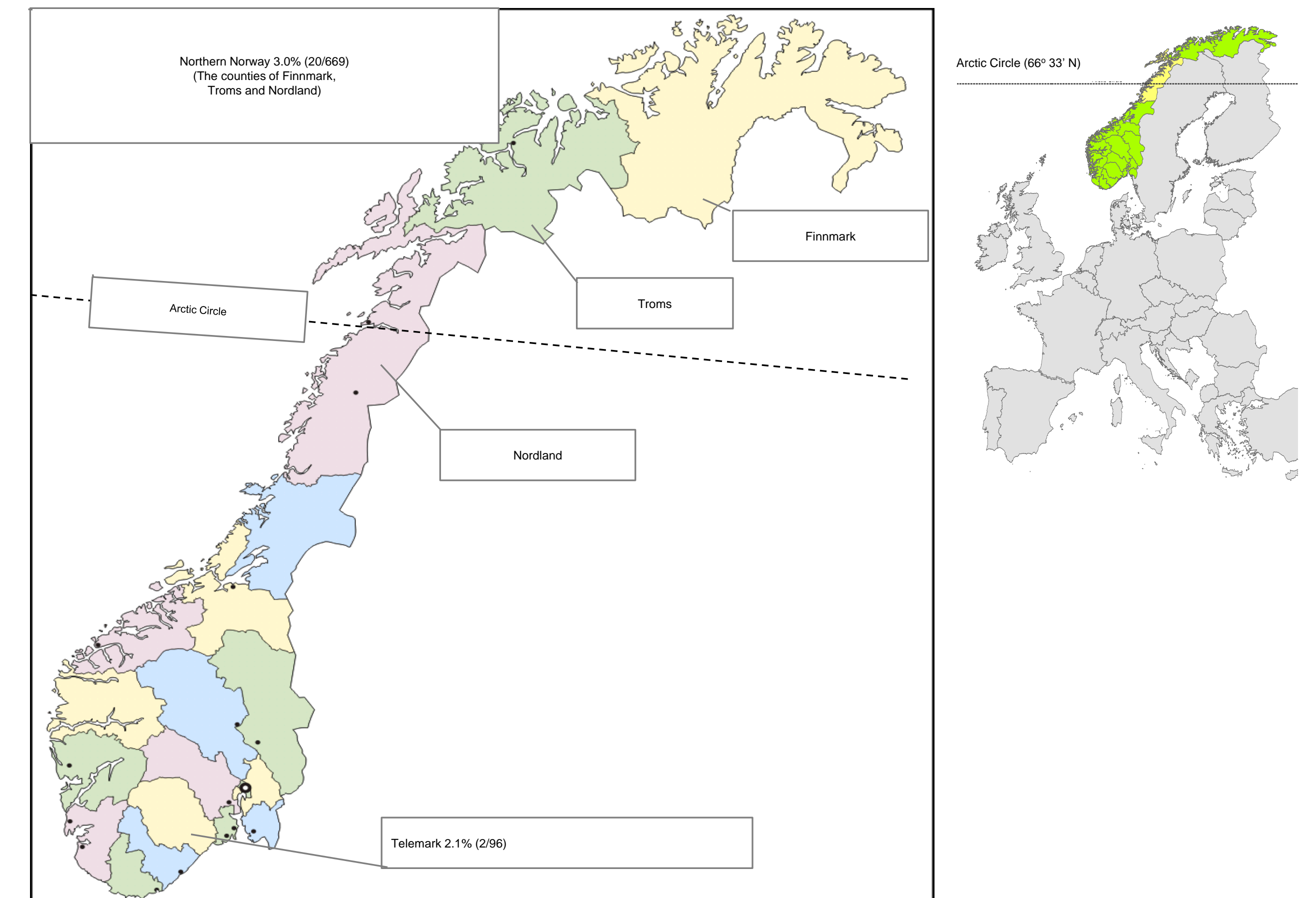


Figure 1. The study areas in northern Norway (the counties of Nordland, Troms and Finnmark) and in southeastern Norway (the county of Telemark). Prevalence of *Anaplasma phagocytophilum* in the collected ticks is shown.

Conclusions

This is the first report on *A. phagocytophilum* occurrence in ticks collected north of the Arctic Circle in Norway, and the prevalence in northern Norway is comparable to that found in ticks from Telemark county in southern Norway.

The findings imply that both humans and pets may contract anaplasmosis also in northern parts of Norway, and that physicians as well as veterinaries in the region need to be aware of the disease.

References

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