

Records of ticks (Acari, Ixodidae) from the Faroe Islands

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New data are given on the tick fauna of The Faroe Islands. So far, three species of *Ixodes* are recorded from the islands. *I. uriae* from *Fratercula arctica*, *Uria algae* and *Rattus norvegicus*; *I. caledonicus* from *Fulmarus glacialis*; and *I. ricinus* from *Homo sapiens*, *Felis catus*, *Canis familiaris*, *Phylloscopus collybita* and *Oenanthe oenanthe*. The possible regular presence of *I. ricinus* on the archipelago is likely to increase the risk for transmission of tick-borne zoonotic pathogens, including *Borrelia garinii*, to humans.

Key words: Faroe Islands, ticks, *Ixodes ricinus*, *Ixodes caledonicus*, *Ixodes uriae*, *Borrelia*

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INTRODUCTION

Ticks (Acari, Ixodidae) are of primary importance as blood-feeding ectoparasites and as vectors of disease agents of terrestrial vertebrates and are ranked second to mosquitoes as the medically most important group of arthropods. The geographical distribution of tick species in Northern Europe was summarized in Table 2 in Jaenson et al. (1994) where records for the Faroe Islands were incorporated into those for Denmark. The Faroe Islands (Map 1) is an isolated archipelago, consisting of 18 islands in the North Atlantic about 300 km north of the Shetland Islands. On the Faroe Islands a Lyme disease cycle seems to occur (Gylfe et al. 1999). It appears to involve the human-pathogenic spirochaete *Borrelia garinii*, the tick vector *Ixodes uriae* (White) and puffins, *Fratercula arctica*, as vertebrate reservoir with occasional transfer and infection of people with

B. garinii. In this paper new records of *I. uriae*, *I. ricinus* and *I. caledonicus* from the Faroe islands are presented together with a discussion of the potential epidemiological significance of the ticks.

MATERIALS AND METHODS

To our knowledge, there has been no systematic survey of ticks on the Faroe Islands. The present study includes occasional records based on materials sent to and studied by the present authors as well as previously published occasional records. Species diagnoses under "our records" are based on descriptions and keys in Arthur (1963), Filippova (1977) and Hillyard (1996), and the nomenclature follows that of Barker & Murrell (2004).



Map 1. The Faroe Islands archipelago. By the courtesy ofort og Matrikelstyrelsen, Copenhagen. Layout: Janus Hansen.

LIST OF TICK SPECIES FROM THE FAROE ISLANDS

***Ixodes uriae* White, 1852**

The seabird tick, the puffin tick.

Earlier records: Ticks on the Faroe Islands have been known for a long time: Landt (1800) writes that "puffin lice (= *I. uriae*) are known to bite... humans". This tick was later recorded in 1965 from ground vegetation and from puffins, *Fratercula arctica* from Mykines and Nolsoy (within the archipelago) by Nosek & Balát (1986). Later, Olsen (1995), Bunikis et al. (1996), Gylfe et al. (1999) and Gylfe (2001) writes about the presence of *I. uriae* on the Faroe islands.

Our records: We have observed that *I. uriae* is very common in the colonies of *F. arctica* and *Uria algae* on the Faroe Islands. *I. uriae* is present on all 18 islands of the archipelago. We recorded one fully engorged *I. uriae* nymph from a Norway (brown) rat, *Rattus norvegicus*, captured in Tórshavn in August/September 2003.

***Ixodes ricinus* (L., 1758)**

The common tick, the castor bean tick, the sheep tick.

Earlier records: The first record of *I. ricinus* on the islands appears to be that from a dog at Vestmanna, Streymoy in August 1990 (Hallas & Olsen, 1990).

Our records: One partly blood-fed nymph of *I. ricinus* on the ear of a 6-year-old boy at Fuglafjørður, Eysturoy (30 July, 2005). In April 2004 one fully engorged female of *I. ricinus* was found attached to a domestic cat at Tvøroyri, Suðuroy. In mid-August 2004 an engorged larva of *I. ricinus* was collected from a chiffchaff (*Phylloscopus collybita*) at Nólsoy and on 5 May 2000 an engorged nymphal *I. ricinus* was found attached to a wheatear (*Oenanthe oenanthe*) at Tórshavn, Streymoy.

***Ixodes caledonicus* Nuttall, 1910**

The northern bird tick.

Our records: On 27 August 2004 a female *I. caledonicus* was found attached to a young, unfledged fulmar (*Fulmarus glacialis*) captured at sea south of Svínøyn. This is the first record of this species from this archipelago. One of us (J-KJ) has investigated 25 preadult and 224 adult fulmars for lice (Phthiraptera) during March, May and August-December (Palma & Jensen 2005). In 2005 another 264 young fulmars were checked for ectoparasites. No tick was found on any of these 513 fulmars. The above-mentioned specimen of *I. caledonicus* was found in late August by the bird-hunter Hergeir Jacobsen, who explained that he, during a period of many years, has captured thousands of young fulmars in late August-early September around the islands and that this was the first and only tick specimen found by him on a fulmar.

DISCUSSION

Ixodes uriae inhabits islands and mainland coasts in the subarctic and temperate regions of the northern and southern hemispheres and has been recorded from more than 50 species of seabirds including many alcid species (Mehl & Traavik 1983, Jaenson et al. 1994, Muzaffar & Jones 2004). Like the other two tick species found on the Faroe Islands *I. uriae* is a three-host tick with each parasitic stage (larva, nymph and adult female) feeding on different host individuals, but in contrast to *I. ricinus*, *I. uriae* is a nidicolous tick species which has a close contact with its host by living in its nest or in its close environment (Piesman & Gern 2004). There was one record of *I. uriae* from a rat and this, with the fact that *I. uriae* sometimes bites humans visiting seabird colonies (Mehl 1983, Mehl & Traavik 1983) suggest that it may transmit infections, e.g., *B. garinii* (Olsen et al. 1993) from birds to reservoir-competent rodents and to humans. Our records of specimens of *I. ricinus* on the islands, and one *I. uriae* nymph from a Norway rat suggests that one of the "usual" transmission cycles for Lyme disease bacteria involving rodents and *I. ricinus* may already be present or could soon become established on the Faroe Islands. Thus, two parallel Lyme borreliosis

cycles may occur on the islands: one involving *I. uriae* and auks and rats, and another one involving *I. ricinus*, passeriform birds and small mammals. The fact that rats may be parasitized by both *I. ricinus* and *I. uriae* suggests that transmission of different genospecies of *Borrelia* may be "mixed" in the rat population and that such spirochetes could be vectored both in the direction from the marine cycle (with *I. uriae* as the main vector) to the rural/urban or sylvatic cycle (with *I. ricinus* as the main vector) as well as and in the opposite direction (rural/urban/sylvatic to marine cycle).

Ixodes ricinus is the common European tick species, which has a wide geographic distribution within the latitudes 65 and 39 °N from Ireland and Portugal eastward to the Volga River in Russia and southward to North Africa (Piesman & Gern 2004). *I. ricinus* is a non-nidiculous tick which awaits a host on the vegetation. This species has a very wide host-range: all stages parasitize medium- to large-sized mammals including humans; larvae and nymphs are also found on small mammals, ground-feeding birds and reptiles (Jaenson et al. 1994). In most parts of Europe *I. ricinus* is a common reservoir and the usual vector of *B. burgdorferi* s.l. infecting humans (Piesman & Gern 2004). The wide host-range is one reason why *I. ricinus* is an important vector of microparasites from mammals and birds to humans. A more or less regular introduction of larval and nymphal *I. ricinus*, infected with *B. burgdorferi* s.l. on birds from continental Europe to the Faroe Islands is likely to occur.

Ixodes caledonicus has a northerly distribution being found from Ireland and Great Britain, particularly Scotland, through Denmark, Norway, Sweden, Germany, Poland, Russia, Crimea, Caucasia and Tadzikistan (Kolonin 1981, Jaenson et al. 1994, Hillyard 1996). It is a nidiculous, ornithophagous species which parasitizes birds that nest on cliffs or buildings, e.g., *Columba livia*, *Falco peregrinus*, *Phoenicurus phoenicurus*, *Sturnus vulgaris*, *Corvus corax*, *Corvus corone* and *F. glacialis* (Arthur 1963, Jaenson et al. 1994, Hillyard 1996). Only one tick specimen was found on several hundreds of fulmars captured

during several years in March and May and late August-early September at sea around the islands. The reason for this absence of ticks is that both *I. caledonicus* and *I. uriae* feed mainly or only on the birds, presumably mainly the young ones, in the nesting areas in the spring-summer season. Moreover, it appears that *I. caledonicus* is not common on the Faroe Islands.

Does *I. ricinus* occur permanently on the archipelago?

There are indications that the distribution of *I. ricinus* in northern Europe is extending northwards as a result of the warmer climate caused by the "greenhouse effect" (Tälleklint & Jaenson 1998, Lindgren & Jaenson 2006). The records of *I. ricinus* on a young boy, on a cat and on a dog suggest that this tick species occurs permanently on the islands. In view of these indications and the fact that *I. ricinus* is an important vector of several pathogens to humans, farm animals and domestic animals it would seem worthwhile to carry out more detailed investigations on the potential presence of this tick on the islands. For instance, it may be that this tick species parasitizes sheep on the Faroe Islands and thus transmits, e.g. *Anaplasma phagocytophilum* on these islands.

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