

Confirmation of occurrence of *Ixodes (Pholeoixodes) rugicollis* Schulze et Schlottke, 1929 (Acari: Ixodidae) in Poland, including the morphological description and diagnostic features of this species

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ABSTRACT. Research on feline and canine ticks was conducted in the years 2004–2005 in the vicinities of Przemyśl, in the village of Torki (Medyka region) and in Przemyśl. Ticks were collected by examining thoroughly the bodies of cats and dogs. Ticks were preserved in 70% ethyl alcohol and their taxonomic identity was determined. It was confirmed that dogs and cats in the study sites carried four species of ticks: *Ixodes (Ph.) rugicollis*, *I. (Ph.) hexagonus*, *I. (Ph.) crenulatus* and *I. (I.) ricinus*. *Ixodes (Ph.) rugicollis* was shown to be a common species among the ectoparasites on these hosts and therefore is considered now to be a regular component of the Polish fauna. Morphological characteristics of all the development stages of *I. rugicollis* are given in the paper.

Key words: Ixodida, Ixodidae, *Ixodes (Pholeoixodes) rugicollis*, domestic dogs and cats, Poland

Introduction

The geographical range of *Ixodes (Ph.) rugicollis* is still not clearly delimited [1,2]. The species was discovered originally in Germany [3]. Until the current research, the only locality in Poland where *I. rugicollis* has been recorded previously is near Wrocław, and by the same authors who described the species [3]. These researchers collected nymphs of *I. rugicollis* from *Mustela nivalis* Linnaeus, 1766 together with the nymphs of *Ixodes (Pholeoixodes) hexagonus* Leach, 1815.

During the current examination of domestic cats and dogs in the vicinities of Przemyśl additional cases of *I. rugicollis* parasitizing these animals were recorded.

Materials and methods

Field studies were conducted between July, 28th, 2004 and April, 10th, 2006, on randomly chosen

domestic cats and dogs in the Przemyśl county (Podkarpackie voivodeship), in the village of Torki (Medyka region) and in Przemyśl in the Veterinary Clinic for Small Animals „Amar” where the material was collected by the veterinarian, Mr. Jan Dacko.

Five cats were examined, 5 times at a few day intervals, giving in total 24 examinations of cats, all of them conducted in Torki. Apart from cats, 100 dogs were examined also, including approximately 50 in Torki and 42 in Przemyśl. Ticks were collected from these hosts during thorough body searches with special attention being given to the areas where ticks attach most frequently (ears, eyelids, necks, tail base, inguinal and anal areas).

Collected ticks were placed into 70% alcohol. Accurate records of the collection were maintained throughout. The collected material was taxonomically identified using keys to the ticks of Poland [4] and the publications of French scientists [5–7]. Morphological characteristics of *I. rugicollis* are given in this paper.

Results

Four ticks species parasitizing dogs and cats were identified during the study: *Ixodes (Ph.) rugicollis* Schulze et Schlottke, 1929; *Ixodes (I.) ricinus* (Linnaeus, 1758); *Ixodes (Ph.) crenulatus* Koch, 1844 and *Ixodes (Ph.) hexagonus* Leach, 1815.

The occurrence of *I. rugicollis* was reported mainly from Torki, where the ticks were collected from three cats and four dogs. In Przemyśl only one case of this species parasitizing dogs was recorded (Table 1).

As the *I. rugicollis* is not well known to scientists, the morphological characteristics that allow this species to be distinguished from the other ticks of Central Europe is given. *Ixodes rugicollis* belongs to the subgenus *Pholeoixodes* Schulze. Ticks of this subgenus are characterized by the following features:

1. Capitulum – short, width to length ratio of II and III palpal article in larvae, nymphs and females equals 1:(2.0–2.5). Palpi club-shaped in outline more convex from the subcentral side. Basis capituli dorsally in females, nymphs and larvae triangular in outline, in males in the shape of trapezium. Hypostome dentition highly reduced in males;
2. Legs, normal length, tarsi narrowing to the top with the strong dorsal contraction on the outside of the Haller's organ;
3. Larva idiosoma chaetotaxy, number of setae: scutal setae (Sc) 5 pairs, central dorsal setae (Cd) 2 pairs, marginal dorsal setae (Md) 7–9 pairs, sternal setae (St) 3 pairs, preanal setae (Pa) 2 pairs, paraanal setae (Para) 3 pairs, anal setae (A) 1 pair, epimeral setae (Epm) 5 pairs.

Morphological features of *Ixodes (Ph.) rugicollis*

Larva

Capitulum. Dorsally posterior margin of basis capituli slightly centrally convex. Its cornua missing. Hypostome broad, tongue-shaped, with broadly rounded tip, hypostome dentition: 3/3 (2-1/1-2).

Idiosoma. Scutum heart-shaped, significantly wider (0.35 mm) than long (0.28 mm). Lateral borders slightly concave or straight, longer than front borders. Marginal dorsal setae (Md) 9 pairs, about 1.3 longer than scutal setae (Sc).

Legs. Coxa I-III with internal angles rounded. Spurs missing.

Nymph

Capitulum (Phot. 1). Dorsally posterior margin of basis capituli slightly convex, almost straight, posterior lateral angles right. Cornua absent. Hypostome tongue-shaped, broadest at the basis, dentition 3/3 (2-1/1-2).



Phot. 1. *Ixodes (Ph.) rugicollis*, nymph – capitulum in ventral aspect

Idiosoma. Scutum heart-shaped, wider (0.59 mm) than long (0.50 mm), widest in the middle length. Scutal setae (Sc) as long as central dorsal setae (Cd) and shorter from marginal dorsal setae (Md). Spiracular plates irregularly round not bigger from larger than anal ring.



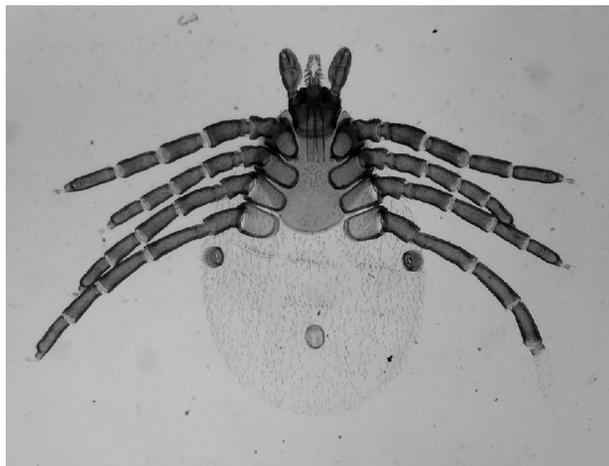
Phot. 2. *Ixodes (Ph.) rugicollis*, nymph – coxae I-IV

Legs. Internal spur of coxa I absent, coxa I-IV lacking external spur (Phot. 2).

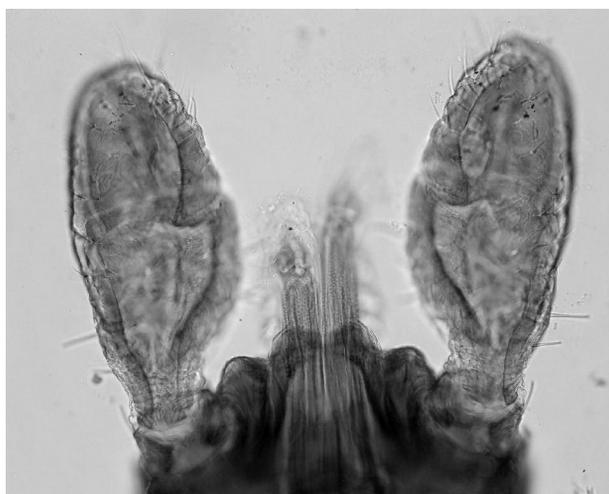
Female (Phot. 3)

Capitulum. Basis capituli with triangular humps on either side of hypostome (Phot. 4). It is a very characteristic feature of this species. Dorsal posterior margin of basis capituli slightly concave. Dorsal posterior lateral angles right or slightly obtuse. Cornua absent. Porose areas round, placed

in triangular hollows. Hypostome lancet-shaped, dentition 5/5 (2-3/3-2).



Phot. 3. *Ixodes (Ph.) rugicollis*, female in ventral aspect



Phot. 4. *Ixodes (Ph.) rugicollis*, female – triangular outgrowths of basis capituli anterior margin



Phot. 5. *Ixodes (Ph.) rugicollis*, female – coxae I-IV

Idiosoma. Scutum heart shaped equal in length and width (1.3 mm), posterior margin rounded. Cervical grooves deep shaped in irregular bows, reaching scutum posterior lateral margins. Lateral grooves indistinct. Spiracular plates irregularly rounded, small, size similar to anal ring.

Legs. Generally follow the characteristic of the subgenus *Pholeioxodes*. Coxa I with slightly extended internal angle. External spurs of coxa I-IV indistinctive or absent (Phot. 5).

Male

Capitulum. Ventrally on posterior lateral parts of basis capituli present areas of fine conical setae [8]. Cornua absent. Hypostome tongue like in shape with broad, hollow, triangular indentation on top.

Idiosoma. Ventral median plate outline hexagonal. Front of anal plate terminated with straight edge. Spiracular plates almost rounded, small, smaller than anal ring.

Table 1. Number of collected ticks *Ixodes (Pholeioxodes) rugicollis* Schulze et Schlottke, 1929

Date	Locality	Host	Number of collected ticks		Collector
			<i>I. rugicollis</i> nymph	female	
2004.09.11	Torki (Medyka region)	<i>Canis familiaris</i> Linnaeus, 1758	1	1	M. Gierczak
2004.11	Torki	<i>Canis familiaris</i>	1	0	M. Gierczak
2004.11	Przemysł	<i>Canis familiaris</i>	1	1	J. Dacko
2004.12.03	Torki	<i>Canis familiaris</i>	3	0	M. Gierczak
2005.03.25	Torki	<i>Felis catus</i> Linnaeus, 1758	0	3	M. Gierczak
2005.04.02	Torki	<i>Felis catus</i>	1	0	M. Gierczak
2005.04.05	Torki	<i>Felis catus</i>	0	2	M. Gierczak
2005.12.11	Torki	<i>Canis familiaris</i>	1	0	M. Gierczak

Legs. Internal spur of coxa I absent. External spurs of coxa I-IV fine, in the shape of short rounded outgrowths.

Ixodes (Ph.) rugicollis like other ticks belonging to subgenus *Pholeoixodes* is a burrow nest dwelling parasite and, like most of these species, parasitizes mammals. It is assumed that the main hosts of *I. (Ph.) rugicollis* are predatory mammals from the family Mustelidae. Our studies revealed that these ticks parasitize domestic cats and dogs.

Discussion

It is agreed generally that the geographical range of *I. (Ph.) rugicollis* is not yet fully defined. Until the current research the only locality in Poland from which this tick has been reported previously was in the vicinities of Wrocław, by the original authors who described this species [3]. *I. (Ph.) rugicollis* nymphs were collected from *Mustela nivalis* Linnaeus, 1766 together with some nymphs of *Ixodes (Ph.) hexagonus* Leach, 1815. Apart from the primary locality in Germany described by the discoverers of this species [3] some other localities are also known: in north-eastern France [5–10], near Arad, Romania [11] and in Switzerland [2]. However, there is little information on the occurrence of *I. (Ph.) rugicollis* in most of Central European countries [2,12].

The thick *I. (Ph.) rugicollis* has not been found in Poland in the last 80 years despite numerous studies on ticks parasitizing mammals and birds in our country [3]. The results of the current work, however, have confirmed that *Ixodes (Pholeoixodes) rugicollis* Schulze et Schlottke, 1929 is indeed a permanent element of the Polish fauna.

The main hosts of this tick are martens and to a lesser extent weasels, but these ticks have also been reported as parasitizing foxes, raccoon dogs, badgers and polecats. The host list is completed by domestic cats and dogs, as evidenced by the results reported in this paper. These ticks dwell mainly in burrows or other shelters of predatory mammals and probably in the tree hollows, nesting boxes, rock hollows and other similar places with lower humidity than ground shelters.

The medical and veterinary importance of *I. (Ph.) rugicollis* has not yet been studied.

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