



Short communication

Winter activity of *Dermacentor reticulatus* (Fabricius, 1794) in the newly emerging population of Lower Silesia, south-west Poland



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ABSTRACT

This paper presents the unexpected winter activity of *Dermacentor reticulatus* (Fabricius, 1794) ticks in a newly emerging population in south-west Poland. Host-seeking ticks were collected from vegetation in January 2016 in a meadow ecosystem in six sites located in the Wrocław Agglomeration, as well as from ten companion animals. A total of 238 questing *D. reticulatus* ticks, comprising 166 females and 72 males, were collected from all examined sites with the highest number of 102 specimens collected in one hour in one locality (Muchobór Wielki, Wrocław). Additionally, two fully-engorged females were collected from two dogs along with one slightly engorged female from a cat. The fact that *D. reticulatus* can be very active in January indicates a need to take into account the increased threat of tick-bite in the winter time.

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1. Introduction

Dermacentor reticulatus (Fabricius, 1794), known as the ornate dog tick, is among the most important vectors of pathogens in Europe. It can transmit pathogens primarily of veterinary importance, including *Babesia canis*, which causes piroplasm infection in dogs (Solano-Gallego and Baneth, 2011; Nowak-Chmura and Siuda, 2012; Król et al., 2016). Immature stages of *D. reticulatus*, which do not actively quest for hosts on vegetation, target small mammals, mainly rodents and insectivores, and occasionally birds (Nosek, 1972a; Szymański, 1987; Pfäffle et al., 2015). The hosts of adults, being exophilic, are medium- to large-sized mammals, including sheep, cattle, dogs, horses, hedgehogs, rabbits, hares, goats, wild boar and moose (Kadulski, 1977; Siuda 1993; Karbowski, 2009). Although it rarely attacks humans, it may participate in the circulation of pathogens with public health importance, including the rickettsiosis, tick-borne lymphadenopathy (TIBOLA) (Parola et al., 2013; Portillo et al., 2015).

D. reticulatus can be found in the temperate climate zone of Eurasia, from the Atlantic coast of Portugal and Spain to Ukraine and continuing to the east of Kazakhstan (Rubel et al., 2016). In recent decades, an increasing range of this species has been observed (Bullová et al., 2009; Karbowski, 2014; Hofmeister et al.,

2015; Paulauskas et al., 2015). In Poland, for many years, the only known localities were reported in north-eastern and eastern Poland (Siuda, 1993; Bogdaszewska, 2005; Mierzejewska et al., 2016). The occurrence of *D. reticulatus* in south-west Poland (Lower Silesia) was noted for the first time in 2009 (Karbowski and Kiewra, 2010), and since then its presence has been confirmed repeatedly (Kiewra and Czułowska, 2013; Kiewra et al., 2015; Król et al., 2015; Mierzejewska et al., 2016). *D. reticulatus* lives mainly in open areas such as meadows, grasslands, pastures, river valleys and lake shores, but can also reside in deciduous forests with watercourses (Nosek, 1972b; Siuda, 1993; Karbowski, 2009; Biaduń, 2011). In Poland, the period of questing activity is usually considered to be the season between the end of March and the beginning of December, with the spring peak between April and May and the autumn peak from September to November (Bartosik et al., 2011).

Knowledge of seasonal tick activity is one of the crucial aspects for the assessment of tick-borne risk (Daniel et al., 2006; Randolph, 2008; Bartosik et al., 2011). This paper presents the unexpected winter activity of *D. reticulatus* in a newly emerging population in south-west Poland.

2. Material and methods

Host-seeking ticks were collected from vegetation in January 2016 in meadow ecosystems in six sites located in the Wrocław Agglomeration, Poland (Fig. 1, Table 1). A collection of ticks at each site was conducted using the flagging method. Two persons col-

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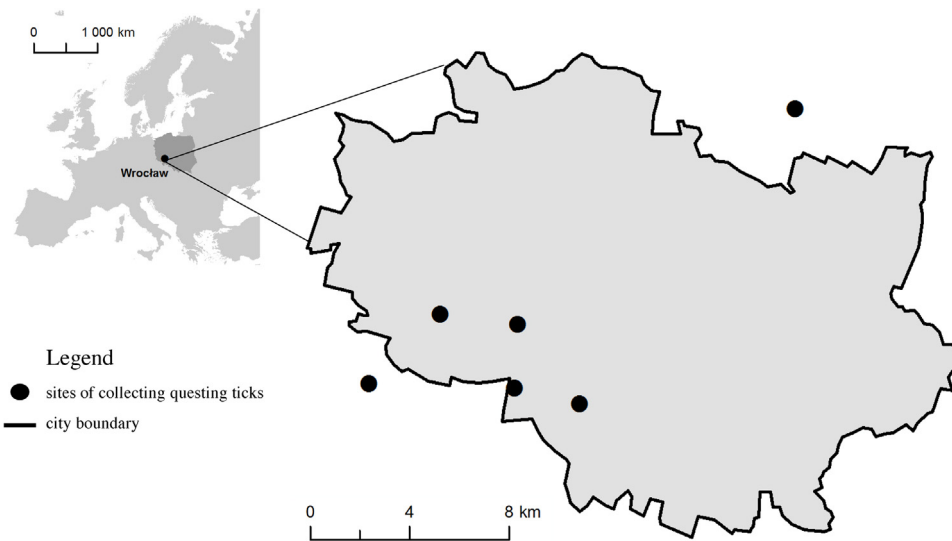


Fig. 1. Questing *Dermacentor reticulatus* sites in south-west Poland (Wrocław Agglomeration and surroundings) in January 2016.

Table 1

Dermacentor reticulatus collected from vegetation in January 2016 at six sites located in the Wrocław agglomeration, south-west Poland.

Locality	Geographical coordinates	Date	Temp ^b (°C)	RH ^b (%)	Number of <i>D. reticulatus</i>		Density ^a
					female	male	
Wrocław (Oporów)	N 51°05'31.68" E 16°57'54.08"	13.01.2016	4	92	0	0	0
Cienin	N 51°11'54.44" E 17°04'45.21"	27.01.2016	12	54	6 (75%)	2 (25%)	8
		14.01.2014	2	90	0	0	0
Wrocław (Muchobór Wielki)	N 51°05'33.71" E 16°55'30.00"	29.01.2016	10	54	42 (60%)	28 (40%)	70
		28.01.2016	10	58	69 (68%)	33 (32%)	102
Kęłbowice	N 51°05'23.91" E 16°51'04.68"	28.01.2016	10	62	1 (50%)	1 (50%)	2
Wrocław (Żerniki)	N 51°07'18.54" E 16°55'58.77"	14.01.2015	3	88	0	0	0
Wrocław (Jerzmanów)	N 51°07'25.96" E 16°52'28.59"	27.01.2016	11	56	30 (88%)	4 (12%)	34
		27.01.2016	12	55	18 (82%)	4 (18%)	22
Total					166 (70%)	72 (30%)	

^a Number of ticks collected per hour.

^b Temperature and relative humidity measured during each collection.

lected for 30 min, in the middle of the day, when the temperature was above zero. During each collection, the temperature was measured to an accuracy of 1 °C; humidity was also measured. Both measurements were taken at a height of 1 m. In previous studies, conducted in the spring and autumn, in consecutive years from 2012 to 2015, the occurrence of *D. reticulatus* at all examined localities was confirmed (Kiewra and Czułowska, 2013; Kiewra et al., 2015; unpublished data). In the laboratory, collected ticks were identified to the stage and species level in accordance with Siuda (1993). The density of ticks was calculated as the number of ticks collected per hour per collector.

Additionally, in January 2016, ten companion animals (7 dogs and 3 cats) were checked for tick occurrence. The pet owners declared that their animals had not left Wrocław in the preceding month. To assess the level of engorgement of *D. reticulatus* we used a four-level classes system developed by Mierzejewska et al. (2015): non-engorged females; slightly engorged ticks, which include females which have just started their blood meal; not-fully engorged, including females that are probably still not engorged enough to produce and lay eggs; and fully engorged females.

3. Results

In total 238 ticks (166 females and 72 males) were collected from vegetation at six sites (Table 1). All collected ticks were identified as *Dermacentor reticulatus*. Questing ticks were noted in all examined sites; however, the density of *D. reticulatus* varied between sites. The highest number of ticks (102) collected in one hour was found in one locality (Muchobór Wielki, Wrocław). Females of *D. reticulatus* predominated over males and constituted 70% of the collection.

Additionally, three ticks identified as *D. reticulatus* females were collected from companion animals, these being two dogs and one cat. Ticks differed in their degree of engorgement level. Fully-engorged females were collected from dogs on 7 and 11 January. A slightly engorged female, which had just started its blood meal, was collected from a cat on 11 January.

4. Discussion

It is generally accepted that the activity of adult *Dermacentor reticulatus* ticks has two peaks of activity. In Poland, the peak spring

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