

Komunikaty

New locations of *Dermacentor reticulatus* ticks in Western Poland: the first evidence of the merge in *D. reticulatus* occurrence areas?

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ABSTRACT. The ornate dog tick, *D. reticulatus*, is the second most common tick species in Europe. It occurs across the temperate zone of Eurasia, from England and France to the basin of the Jenisej River in Siberia, and the occurrence area ranges from 56–57°N latitude down to 52°N latitude. The range is divided into two distinct parts, the West-European and the Eastern part. The western region covers France and northern Spain, South-western England and Wales, Germany, Austria, Czech, Western Slovakia and Hungary. The eastern region extends from the eastern part of Poland and Slovakia, through Belarus and Russia as far east as Siberia. The southern parts of this region cover Ukraine, Eastern Hungary and Romania. From the 1970s, *D. reticulatus* has expanded its area of occurrence. In Poland, the front of the area is historically situated along the Vistula River. From the 1980s new tick populations has appeared to the west of this border. In the past years, new populations of *D. reticulatus* appeared close to the western border of Poland near Szczecin and Wrocław. These are possibly the first observations of the merge between the two separated areas of *D. reticulatus* occurrence.

Key words: *Dermacentor reticulates*, dispersal, new area

Ornate dog tick, *Dermacentor reticulatus*, also known as ornate cow tick, is the second most common tick species just after *Ixodes ricinus*, and is of a great epidemiological importance in Europe. This species prefers wet habitats, of either opened or sparsely wooded areas. Such conditions are noted over the lake shores and river banks, on meadows, and near the forest borderlines. The crucial environmental factor is a high ground water table, which prevents surface of the soil from drying.

Dermacentor reticulatus is found in boreal and temperate forest zones across Eurasia, from England and France to the basin of the Jenisej River in Siberia. The area of its occurrence ranges from latitude of 56–57° at the northern extreme down to latitude of 50° at the southern end of the range. The range for *D. reticulatus* is divided in two parts – the West-European and the Eastern region [1]. The reasons for the primary division of the range, and for the absence of the species in the area between these two regions, are not known. Several hypotheses have been postulated, mainly in relation to the natural conditions and climatic changes [2]. The West-European region includes populations occurring from France to Eastern Germany [3–5]. In Germany populations are recorded from Wiesbaden (in Hesse), Bayern, Ried (in the mountains along Germany's southern border) and as far east as Leipzig [6,7]. The populations from Austria, Czech Republic and Western Slovakia belong generally to one focus. This species inhabits the basins of the Moravia and Danube Rivers, along the southern border between Bratislava and Komarno [8]. In the Eastern region, *D. reticulatus* is common from eastern part of Poland, through Belorussia and Russia as far east as Siberia. Within Russia, it is the second most common tick species in majority of the areas, with the most common species depending on

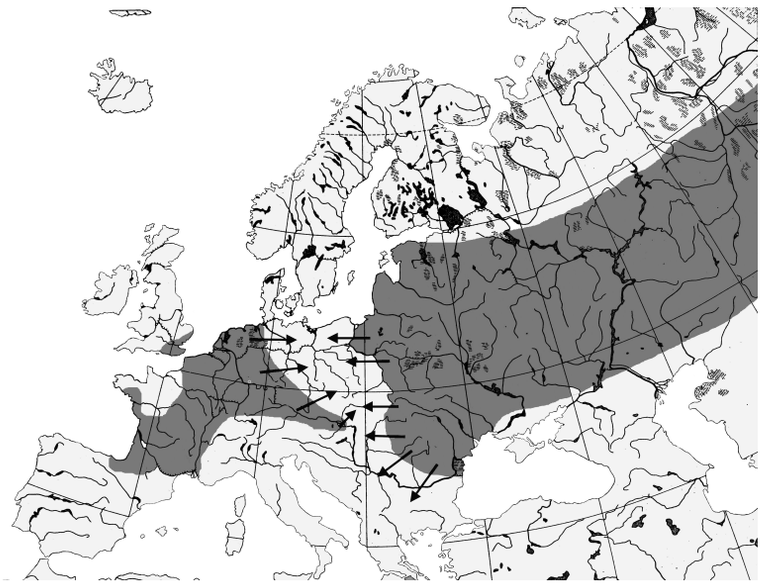

Fig. 1. Previous existing range and directions of migration of *D. reticulatus* tick in Europe

the area being either the common tick, *Ixodes ricinus*, or the taiga tick, *I. persulcatus*. In the European parts of the former USSR, large populations of *D. reticulatus* are described in the Moscow District [9,10]. The northern limit of the range is located in the Leningrad District, where the species is relatively rare, predominated by both *I. ricinus* and *I. persulcatus* [11]. The determination of the eastern boundary of the range is difficult, because some reports from this area are not reliable, and ticks identified as *D. reticulatus* may belong to other *Dermacentor* species. In Belorussia *D. reticulatus* occurs in Polesie (i.e., Gomel Region) [12]. The range of the populations in Polesie connects with the area of *D. reticulatus* occurrence in Podlasie in Poland, and these ranges should in fact be considered as one. This population extends to regions of Vilnius [13]. *D. reticulatus* was reported in Ukraine from Kiev, the central part of the country [14]. The Eastern region also encompasses populations from Eastern Slovakia, where the species occurs near the south-eastern borders along the Latorica River. In Romania *D. reticulatus* is quite common in Northern provinces but relatively rare in other parts of the country. The area between these two regions, in which *D. reticulatus* has been absent, is approximately triangular. The northern edge runs along the Baltic coast from central Germany (12–13°E) to central Poland (19°E). The area tapers to a point at the southern border of Hungary.

Fig. 2. The pattern of spread of *D. reticulatus* in Poland
▒ the foci of appearance until 1990s according to Siuda [1,17];
▨ the area of appearance until 2007 [1,7 and Karbowiak, unpublished data];
♦ the new foci between 2007–2009 after: Kadulski and Izdebska [19], Karbowiak, and Stańczak et al., unpublished data; ◊ the new foci in 2009.

The occurrence areas outlined above are based on primary descriptions from the 1970s and 1980s. Nowadays, *D. reticulatus* shows a distinct tendency of expansion into new areas, and is constantly observed in many locations where it had not been reported previously (Fig. 1). Until the 1970s *D. reticulatus* was rare throughout Germany. During the 1980s it was reported slightly more often in the western part of this country, though reports from the east of the country remained incidental. However, in recent years reports from Saxony and Brandenburg increased, and in the rest of the country some new localities continued to appear [6].

Populations of *D. reticulatus* in Poland are reported from eastern regions. The best recognized localities are in Podlasie, Augustów Forest, Knyszyn Forest, Biebrza Basen, Pisz Forest and in the Lublin region. On the basis of previous reports, Siuda [1] described 10 main foci and established at the western border of the Eastern range. It covers the area east from the Vistula River and towards north from the San River. There are foci located near Augustów, Biebrza, Knyszyn, Białowieża, Polesie, Hrubieszów, Western Bug Basin, Roztocze, Stalowa Wola and Masuria. In the light of the latest reports, it appears appropriate to include this area with the main, so called Russian, area of the range

[2,15]. The description of separate localities is less important in epidemiological studies of this species, because these localities are not continuous. This is presented on the map showing the range of appearance, based on data collected in the 1980s by Szymański [16], Siuda [1,17] and other investigators (Fig. 2).

The expansion of *D. reticulatus* towards the west has been observed for several years. This species was rarely found in Slovakia until the beginning of the twenty-first century, and then new localities continued to appear [18]. In Poland *D. reticulatus* has been reported from areas near the western border of this country. Kadulski and Izdebska [19] recorded the appearance of new localities of this tick species in Pomeranian province, Kashube and in Tuchola Woods. The latest reports refer to new localities in Namyślin, on the western border of Poland, where ticks were collected in autumn 2007 from roe deer and red deer. There are new localities being found in Warsaw, where until recently only common tick, *I. ricinus*, was recorded (Fig. 2). In 2009, one male in spring and two males in autumn of *D. reticulatus* were collected among *I. ricinus* specimens in the Lower Silesia region, in Bolesławiec administrative district, in the Forest inspectorate Chocianów (N 51°22 E 15°35), and in the mesoregion of Lower-Silesian Wood. The collection of ticks was carried out from vegetation according to standard flagging-method. The study area was located at lowland ground, near a forest track, situated on the verge of the forest (Fig. 3), where *Pinus sylvestris* L. was a dominant species. The plant community belonged to a group of the boreal lowland association, from the Dicrano-*Pinion* alliance Libb. 1933 [20]. There was also some evidence found of *Dermacentor* tick occurrence in Wrocław, where at the same time some *Dermacentor* specimens were collected from a dog by the staff of the Department of Internal Diseases within the Clinic for Horses, Dogs and Cats at Wrocław University of Environmental and Life Sciences. The dog owner confirmed that the dog had not left the city. Considering recent data from eastern Germany the discovery of *D. reticulatus* in Western Poland, implies that ticks found in the Namyślin and Chocianów regions have most likely migrated from Germany, and were representatives of populations from the West-European range. Considering the speed and the direction of the expansion it is very likely that the western and eastern populations of *D. reticulatus* will join together within a short period of time. The connection is going to take place in Poland, probably on Kielce–Łódź–Poznań–Koszalin line. The reasons for expansion of *D. reticulatus* into previously uninhabited areas are as unclear as the reasons for the primary division of its distribution. Most of the hypotheses connect these movements with the Global Climate Change in the similar way how the explanations for the historic discontinuity of its distribution focused on climatic factors.

Fig. 3. The habitat of *D. reticulatus* in Lower Silesia

Human activities have influenced the increasing numbers of *D. reticulatus*. Tourism and translocation of ticks into new areas are classic examples of human factors influencing expansion of parasites. In addition, the protection of large mammal species and the subsequent increase in their population densities improved host availability for adult ticks, and animal transportation provided means of expanding of ticks into new areas. This is especially true during winter, when large numbers of ticks spend several months on their hosts [21]. The protection and reconstruction of natural habitats have produced the similar results. The creation of ecological corridors for host species allows ticks to expand their range. This can be observed in Warsaw, along the fore-edge of Vistula [22,23]. The forest areas serve as pathways for the migration of many types of free-ranging animals across the city, and also indirectly serves tick migration.

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