

A new map of geo-referenced hard tick locations in Germany

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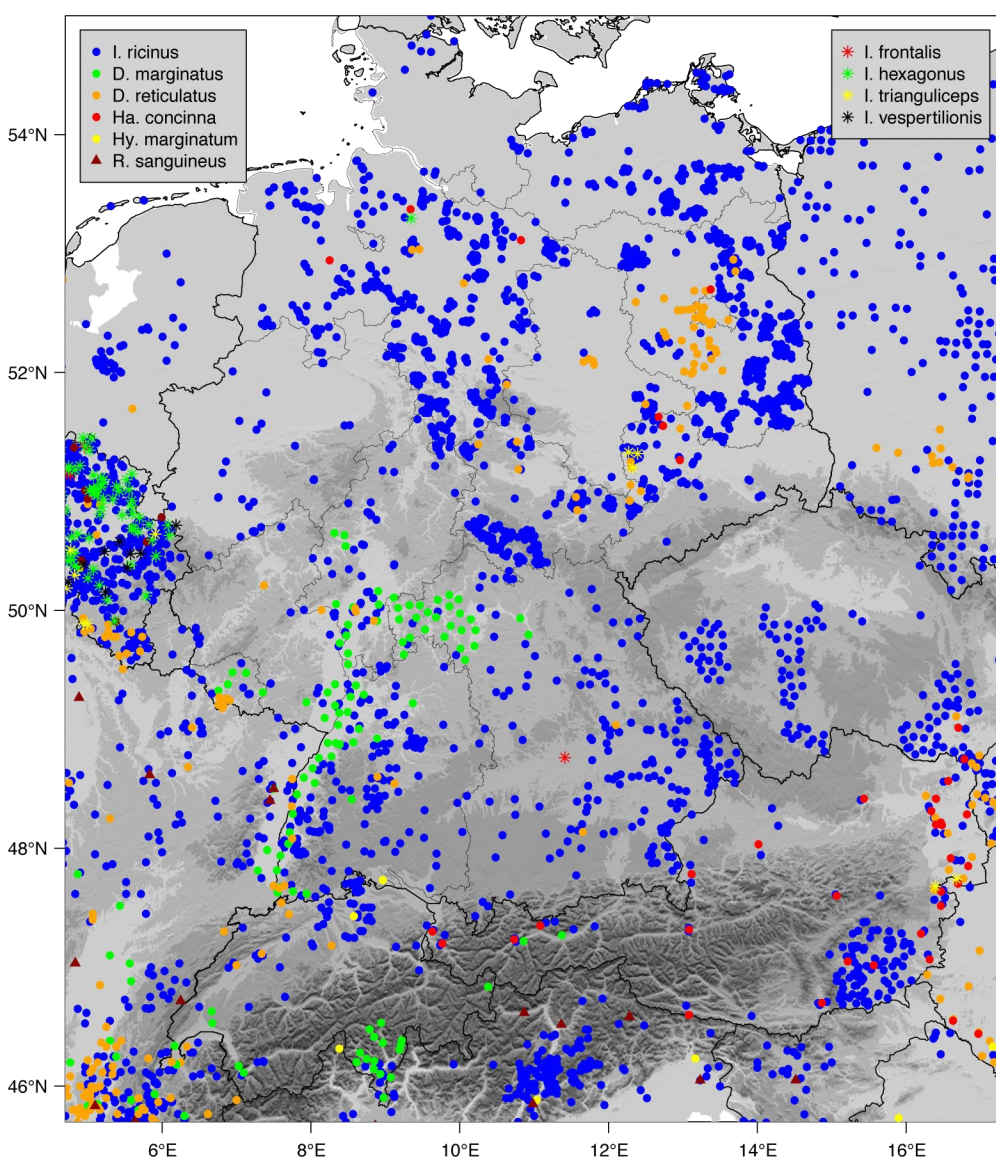
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Motivation

Geo-referenced locations were compiled in order to prepare a dataset applicable for species distribution models, e.g. a niche model for the prediction of current and future tick distributions in Germany. Existing digital datasets from Estrada-Peña *et al.* (2013) and the *Global Biodiversity Information Facility* (GBIF) were complemented to reduce data gaps.

Data and method

A literature study on tick locations in Germany was performed to compile geographical coordinates (1) extracted from recent papers, (2) extracted from restricted papers, mainly published in German language, (3) digitized from historical hand-drawn maps and (4) provided by colleagues (personal communications).



Ixodes ricinus

(Gemeiner Holzbock)



Most abundant tick species in Germany, distributed over the whole territory. Vector of the agents of tick-borne encephalitis (TBE), Lyme borreliosis, tularemia, babesiosis, and other diseases.

Dermacentor marginatus

(Schafzecke)



Distribution in Germany mostly restricted to the Rhine valley, a region favored by climate. Vector of the agents of TBE, rickettsiosis, tularemia, piroplasmosis.

Dermacentor reticulatus

(Auwaldzecke)



Clustered locations documented in the Rhine valley, in Berlin and its vicinity and in the Saarland. Its occurrence might cover a much larger area in Germany than shown here. Vector of TBE, tularemia and other diseases.

Haemaphysalis concinna

(Reliktzecke)



Hygrophil tick species with fragmented distribution in humid habitats and floodplains. Vector of TBE, tularemia and rickettsiosis.

Rhipicephalus sanguineus

(Braune Hundezecke)



Introduced by traveling dogs. Endemic foci in homes and animal shelter, no outdoor location documented in Germany. Vector of ehrlichiosis (canine rickettsiosis) and hepatzoonosis.

Results

A total of 1,948 geo-referenced locations of ticks in Germany was compiled from two existing datasets (993 locations) and an extensive literature study (955 locations). The resulting digital dataset comprises the following tick species: *I. ricinus* (1,778 locations), *Ixodes trianguliceps* (3), *Ixodes frontalis* (1), *Ixodes hexagonus* (1), *D. marginatus* (75), *D. reticulatus* (82), *Ha. concinna* (7) and *Hyalomma marginatum* (1). The data were used to draw a tick map for Germany, showing *I. ricinus* distributed in the whole federal territory, while *D. marginatus* were restricted to the region of the Rhine valley and *D. reticulatus* were clustered in specific regions. For a better survey the surrounding area including Austria and Switzerland is plotted. No data were available for the brown dog tick *R. sanguineus* in Germany, but 2 locations were documented in Eastern France, not far away from the German border. *Hy. marginatum* are regularly introduced from the south to Germany and other central European countries by migratory birds.

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References

Estrada-Peña, A., *et al.*, 2013: Association of environmental traits with the geographic ranges of ticks (Acari: Ixodidae) of medical and veterinary importance in the western Palearctic. A digital data set. *Exp. Appl. Acarol.*, 59, 351–366.
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