Factors responsible for Ixodes ricinus presence and abundance across a natural-urban gradient

SND-ID: 2023-110-1. **Version**: 1. **DOI**: https://doi.org/10.5878/d3d7-1n16

Download data

Janzen_et_al_2017_2019_Landscape characteristics and catch data for Ixodes ricinus.txt *(81.66 KB)*

Janzen_et_al_2017_2019_Landscape characteristics and catch data for Ixodes ricinus.xlsx *(675.8 KB)*

Associated documentation

Coordinates_SWEREF99TM.txt *(1.42 KB)*

Coordinates_SWEREF99TM.xls *(27 KB)*

Variable description.docx *(23.57 KB)*

Download all files

2023-110-1-1.zip *(~809.46 KB)*

Citation

Janzén, T. (2023) Factors responsible for Ixodes ricinus presence and abundance across a natural-urban gradient (Version 1) [Data set]. Södertörns högskola. Available at: https://doi.org/10.5878/d3d7-1n16

Creator/Principal investigator(s)

Thérese Janzén - Södertörn University, School of Natural Sciences, Technology and Environmental Studies

Research principal

Södertörns högskola - School of Natural Sciences, Technology and Environmental Studies

Principal's reference number

3430-3.1.1-2022

Description

To better understand the spatial distribution of the common tick Ixodes ricinus, we investigated how local site factors and landscape characteristics influence tick presence and abundance in different greenspaces along the natural-urban gradient in Stockholm County, Sweden. Ticks and field data were collected in 2017 and 2019 and analyzed in relation to habitat type distributions estimated from land cover maps using geographical information system (GIS).

In 2017, ticks and field data were collected from 12 different sites in Stockholm County originally chosen as random controls for another study but was never used. In 2019, we collected ticks and field data at 35 randomly selected sites along the natural-urban gradient. To calculate and urbanization index, we used the proportion of artificial surfaces surrounding each site. All sampling sites were visited once with a total of 295 sampling plots inventoried for ticks and field data. For each sampling plot, we recorded date, time, temperature, weather conditions, number of ticks, vegetation height and tree stem density surrounding the inventory plot.

To retrieve large landscape characteristics, we established 10 buffer zones ranging from 100m to 1000m around each sampling site in GIS using satellite land cover maps (retrieved from: https://www.naturvardsverket.se/verktyg-och-tjanster/kartor-och-karttjanster/nationella-marktackedata/ladda-ner-nationella-marktackedata/). These maps have a spatial resolution of 10m and include the following main categories 1) Forest and seminatural areas, 2) Open areas, 3) Arable land, 4) Wetlands, 5) Artificial surfaces and 6) Inland and marine water. These main categories are further divided into subcategories with detailed information regarding the different land cover classes. In the analyses, we used the main categories, with the exception of Forest and seminatural areas where we included eight individual forest types: Pine forest, Spruce forest, Mixed coniferous forest, Mixed forest, Broadleaved forest, Broadleaved hardwood forest, Broadleaved forest with hardwood forest and Temporarily non-forest.
To calculate landscape configuration metrics at each sampling site, we used land cover data from the GIS buffers with a 1000m radius, exported to GeoTIFF format and analyzed them with FRAGSTATS version 4. For landscape heterogeneity we used Shannons' diversity index (SHDI) and to measure the aggregation of landscape attributes we used Contagion (CONTAG). As measures of forest configuration, we used percent of forest cover (PLAND) and total forest edge length (TE).
All statistical analyses were performed with R version 4.0.3. To analyze the effect of possible risk factors for tick abundance in different greenspaces across the natural-urban gradient, we used generalized linear mixed models assuming Poisson distributed residuals. As the data contained a larger proportion of zeros than would be expected according to a Poisson or a negative binomial distribution causing overdispersion, we fitted zero-inflated Poisson models using the package glmmTMB (generalized linear mixed models using Template Model Builder)

Data contains personal data

No

Language

English

Time period(s) investigated

2017 – 2019

Data format / data structure

Numeric

Text

Species and taxons

Ixodes ricinus linnaeus, 1758

Data collection 1

- Mode of collection: Field/Intervention experiment
- Description of the mode of collection: In 2017, ticks and field data were collected from 12 different sites in Stockholm County originally chosen as random controls for another study but was never used. In 2019, we collected ticks and field data at 35 randomly selected sites along the natural-urban gradient. To calculate and urbanization index, we used the proportion of artificial surfaces surrounding each site. All sampling sites were visited once with a total of 295 sampling plots inventoried for ticks and field data. For each sampling plot, we recorded date, time, temperature, weather conditions, number of ticks, vegetation height and tree stem density surrounding the

inventory plot. To retrieve large landscape characteristics, we established 10 buffer zones ranging from 100m to 1000m around each sampling site in GIS using satellite land cover maps (retrieved from: https://www.naturvardsverket.se/verktyg-och-tjanster/kartor-och-karttjanster/nationella-marktackedata/ladda-ner-nationella-marktackedata/). These maps have a spatial resolution of 10m and include the following main categories 1) Forest and seminatural areas, 2) Open areas, 3) Arable land, 4) Wetlands, 5) Artificial surfaces and 6) Inland and marine water. These main categories are further divided into subcategories with detailed information regarding the different land cover classes. In the analyses, we used the main categories, with the exception of Forest and seminatural areas where we included eight individual forest types: Pine forest, Spruce forest, Mixed coniferous forest, Mixed forest, Broadleaved forest, Broadleaved hardwood forest, Broadleaved forest with hardwood forest and Temporarily non-forest. To calculate landscape configuration metrics at each sampling site, we used land cover data from the GIS buffers with a 1000m radius, exported to GeoTIFF format and analyzed them with FRAGSTATS version 4. For landscape heterogeneity we used Shannons' diversity index (SHDI) and to measure the aggregation of landscape attributes we used Contagion (CONTAG). As measures of forest configuration, we used percent of forest cover (PLAND) and total forest edge length (TE). All statistical analyses were performed with R version 4.0.3. To analyze the effect of possible risk factors for tick abundance in different greenspaces across the natural-urban gradient, we used generalized linear mixed models assuming Poisson distributed residuals. As the data contained a larger proportion of zeros than would be expected according to a Poisson or a negative binomial distribution causing overdispersion, we fitted zero-inflated Poisson models using the package glmmTMB (generalized linear mixed models using Template Model Builder)

- Time period(s) for data collection: 2017 – 2019
- Source of the data: Biological samples, Other

Geographic spread

Geographic location: Stockholm County

Geographic description: Samling sites across the natural-urban gradient of Stockholm County, Sweden

Responsible department/unit

School of Natural Sciences, Technology and Environmental Studies

Contributor(s)

Patrik Dinnétz - Södertörn University, School of Natural Sciences, Technology and Environmental Studies

Mona Petersson - Södertörn University, School of Natural Sciences, Technology and Environmental Studies

Monica Hammer - Södertörn University, School of Natural Sciences, Technology and Environmental Studies

Funding

- Funding agency: The Foundation for Baltic and East European Studies
- Funding agency's reference number: 52/2018_OSS
- Project name on the application: Human – environment interactions and the epidemiological periurban landscape of tick-borne diseases

Research area

Environmental sciences (Standard för svensk indelning av forskningsämnen 2011)

Natural sciences (Standard för svensk indelning av forskningsämnen 2011)

Ecology (Standard för svensk indelning av forskningsämnen 2011)

Biota (INSPIRE topic categories)

Environment (INSPIRE topic categories)

Keywords

Landscape ecology, Urbanisation, Habitats and biotopes, Species distribution, Ixodidae

Publications

Janzén, T., Hammer, M., Petersson, M., & Dinnétz, P. (2023). Factors responsible for Ixodes ricinus presence and abundance across a natural-urban gradient. Plos one, 18(5), e0285841.
DOI: https://doi.org/10.1371/journal.pone.0285841

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Accessibility level

Access to data through SND
Data are freely accessible

Use of data

Things to consider when using data shared through SND

Versions

Version 1. 2023-08-08

Contact for questions about the data

Thérese Janzén
therese.janzen@sh.se

Download metadata

DataCite
DDI 2.5
DDI 3.3
DCAT-AP-SE 2.0
JSON-LD
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Citation (CSL)
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