

Geographical distribution and climate adaptation of the Eurasian hard tick *Haemaphysalis concinna*

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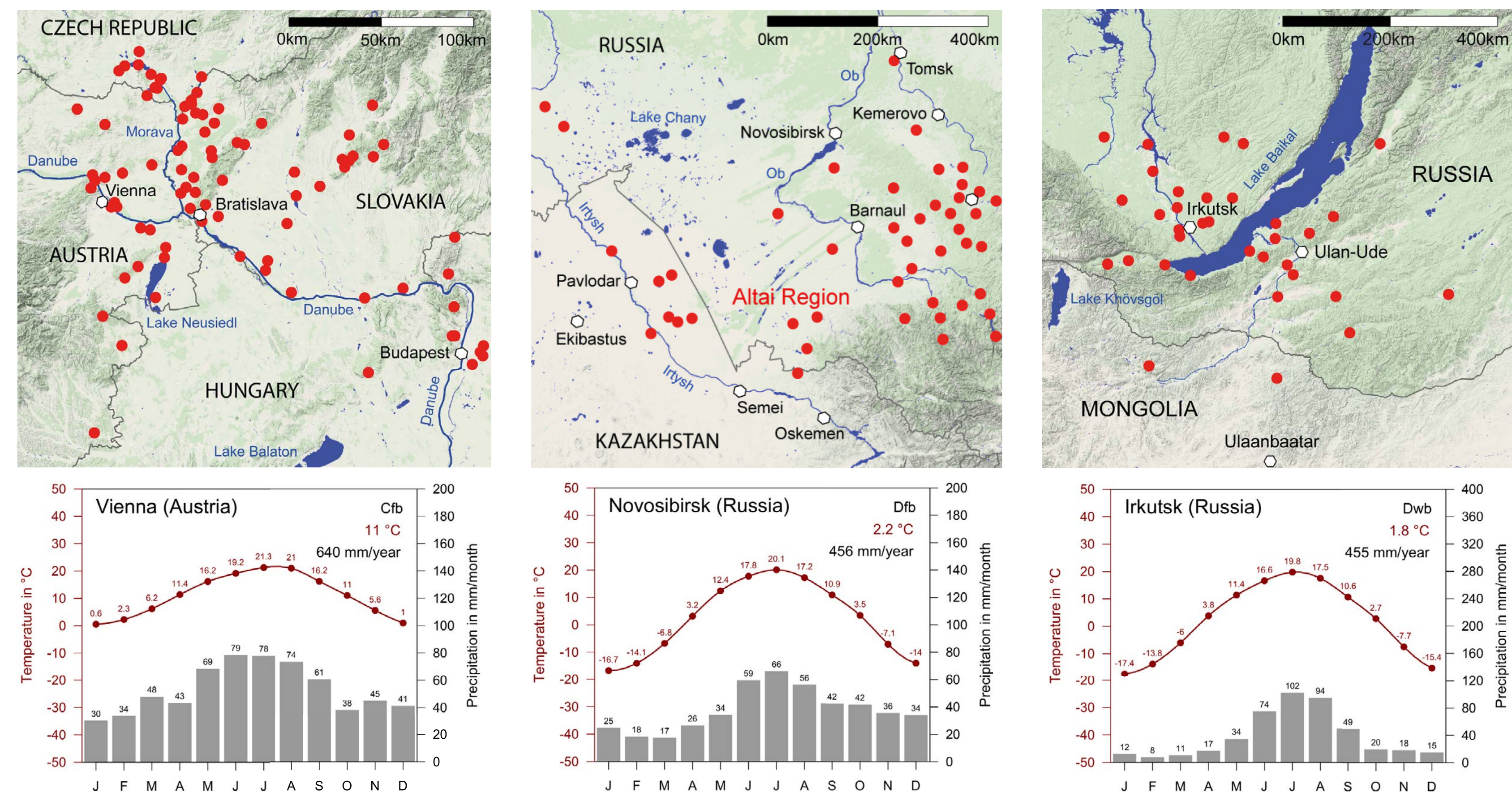
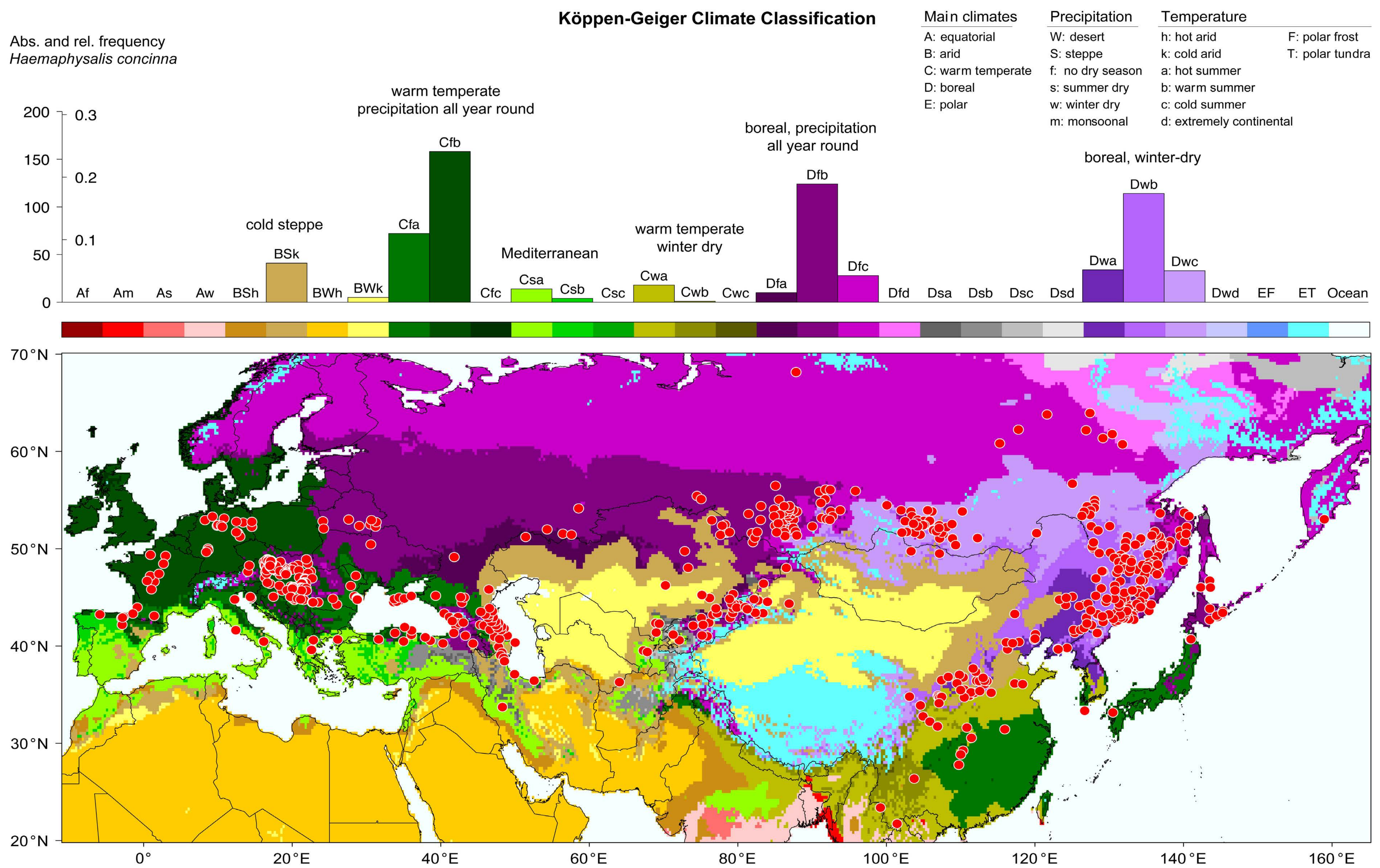
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Motivation

Up-to-date maps depicting the geographical distribution and climate adaptation of *Haemaphysalis concinna* (Koch, 1844) were missing until recently. Here the entire so far known distribution of *H. concinna*, a proven vector of the TBE virus, is presented ranging from the Spanish Atlantic coast to Kamchatka, far-eastern Russia, mainly within 28-64° N latitude.

Data and methods

The herein used dataset consists of 656 georeferenced locations in Eurasia. Special emphasis is on Central Europe, where *H. concinna* is the third most abundant hard tick species flagged from vegetation. To investigate its climate adaptation, the georeferenced locations were superimposed on a high resolution map of the Köppen-Geiger climate classification.



Results

The frequency distribution of the tick's occurrence in the different climates shows three peaks related to the following types: (i) warm temperate with precipitation all year round, (ii) boreal with precipitation all year round, and (iii) boreal, winter dry, climates. Almost 87 % of all *H. concinna* locations are related to these climates. The remaining locations are characterized by cold steppes and deserts, Mediterranean climates, or warm temperate climates with dry winters. As examples, high-resolution maps for Vienna, Novosibirsk and Irkutsk are presented together with their climate diagrams. They show similar temperature and precipitation conditions during May to September, the main seasonal activity period of the parasitic life stages of *H. concinna*.