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# The spatial structure of European vertebrate trophic webs.

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## Abstract

Trophic networks depict species' biotic interactions in nature, linking biodiversity to ecosystem functioning and services. Generally, food webs are built from observational data on a group of species for a given area. Thus, they cannot infer how trophic interactions vary at a large and continuous spatial scale. The metaweb concept seeks to overcome this limitation by representing all potential biotic interactions in a given species pool, and, when combined with species distributions, can represent groups of locally interacting species (e.g. local networks) across the landscape. Here, we apply this spatial foodweb analysis to European tetrapods (1152 species) by combining a metaweb of trophic interactions with species distributions, and quantifying a range of structural properties of trophic networks over the European landscape. Our results show that structural properties of European tetrapod trophic networks are non-randomly distributed in space, and were less variable within regions than between regions. Some northern European regions had fewer but highly connected species, suggesting that these regions are more fragile to perturbations. On the other hand, trophic properties of southern regions were more heterogeneous across the landscape. Importantly, we found that regions based on network structural similarity can be related to European biogeographic regions. This work is, to our knowledge, the first attempt to map and define ecogeographic regions based on trophic interactions at the continental scale.

**Keywords:** Trophic interactions, metaweb, food, webs, European tetrapods, biogeographic regions

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