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## Evaluating alternative hypotheses behind biodiversity and?multifunctionality?relationships in the forests of Northeastern China

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摘要	Background: The importance of biodiversity in maintaining multiple ecosystem functions has been widely accepted. However, the specific mechanisms affecting biodiversity and ecosystem?multifunctionality?(BEMF) relationships in forests are largely unknown. This is particularly evident for the macroscale of a large forested landscape. Methods: Based on 412 one-tenth hectare field plots distributed over forested areas across northeastern China, we evaluated three alternative hypotheses explaining the relationships between BEMF, namely: niche complementarity, mass ratio, and vegetation quantity effect. We used Rao's quadratic entropy and community weighted mean trait values to quantify?forest?"biodiversity". These two variables represent two complementary aspects of functional properties, which are in line with niche complementary and mass ratio effects, respectively. Results: Ecosystem?multifunctionality?was negatively associated with the community weighted mean values of acquisitive traits (a proxy of mass ratio effect). Rao's quadratic entropy (a proxy of niche complementarity) had no relationship with ecosystem?multifunctionality. Higher stand biomass greatly increased ecosystem?multifunctionality, which is in line with the vegetation quantity effect. Our results confirm that in the temperate forests of northeastern China, the relationship of BEMF was primarily affected by vegetation quantity, followed by mass ratio effects. Conclusions: The results of this study contribute to a better understanding of the main drivers of ecosystem?multifunctionality?in?forest?ecosystems. The results of this study provide additional evidence to support the vegetation quantity and mass ratio hypotheses in?forest?ecosystems.
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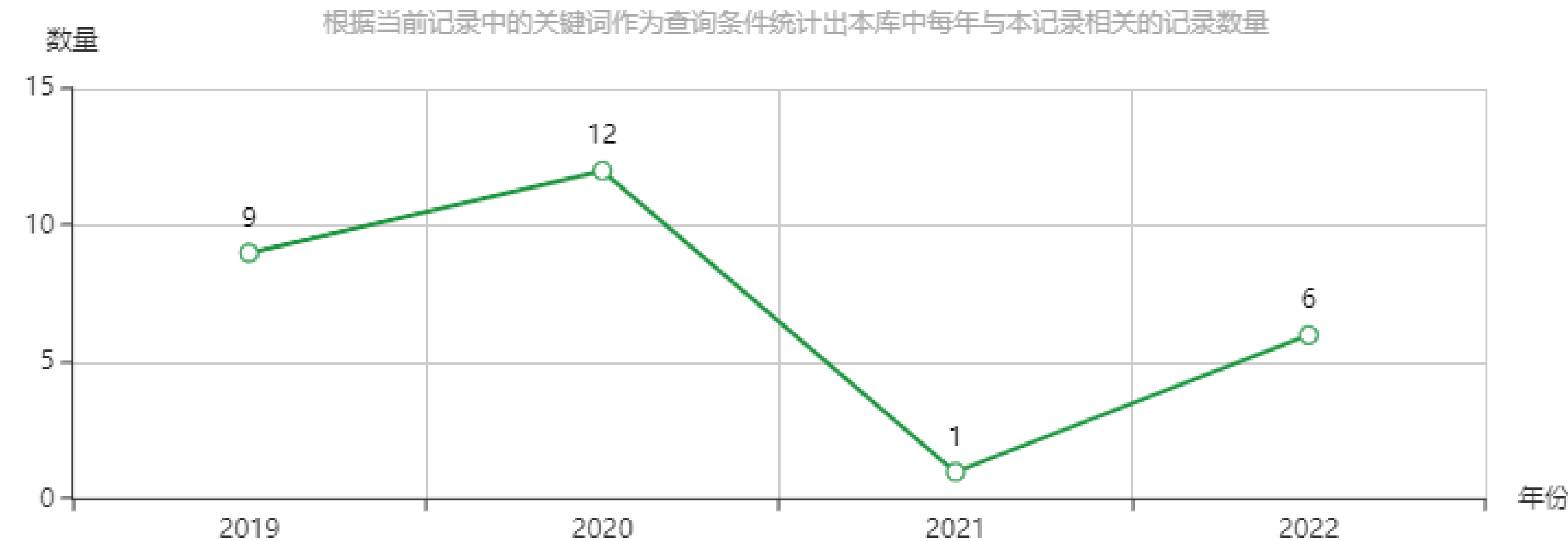
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