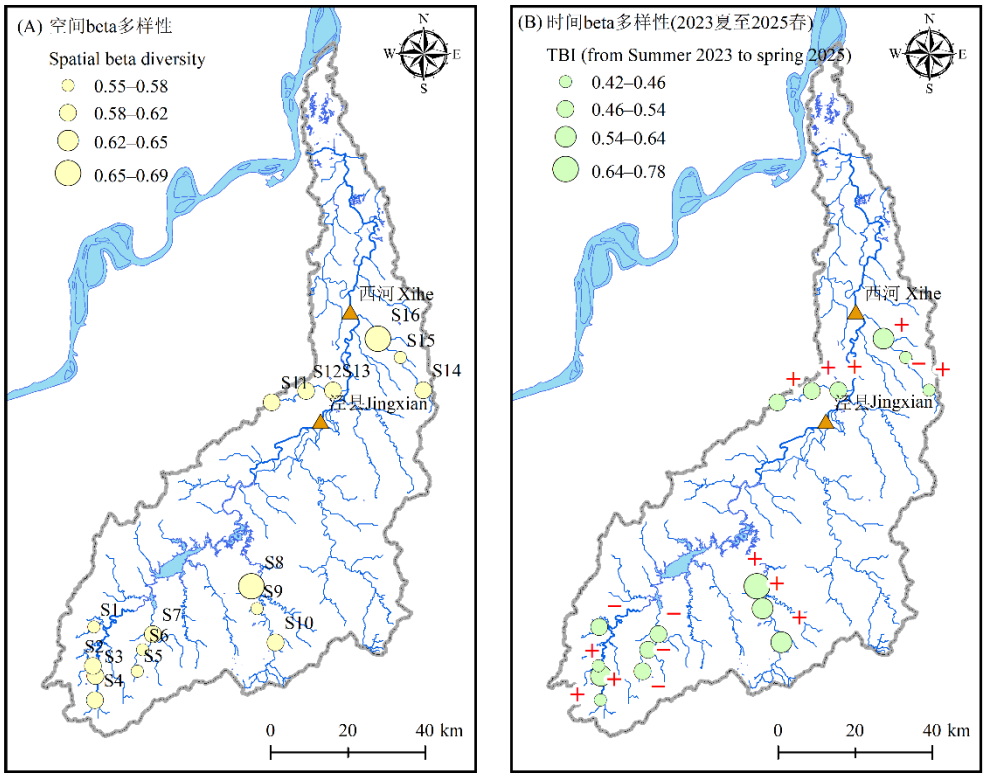
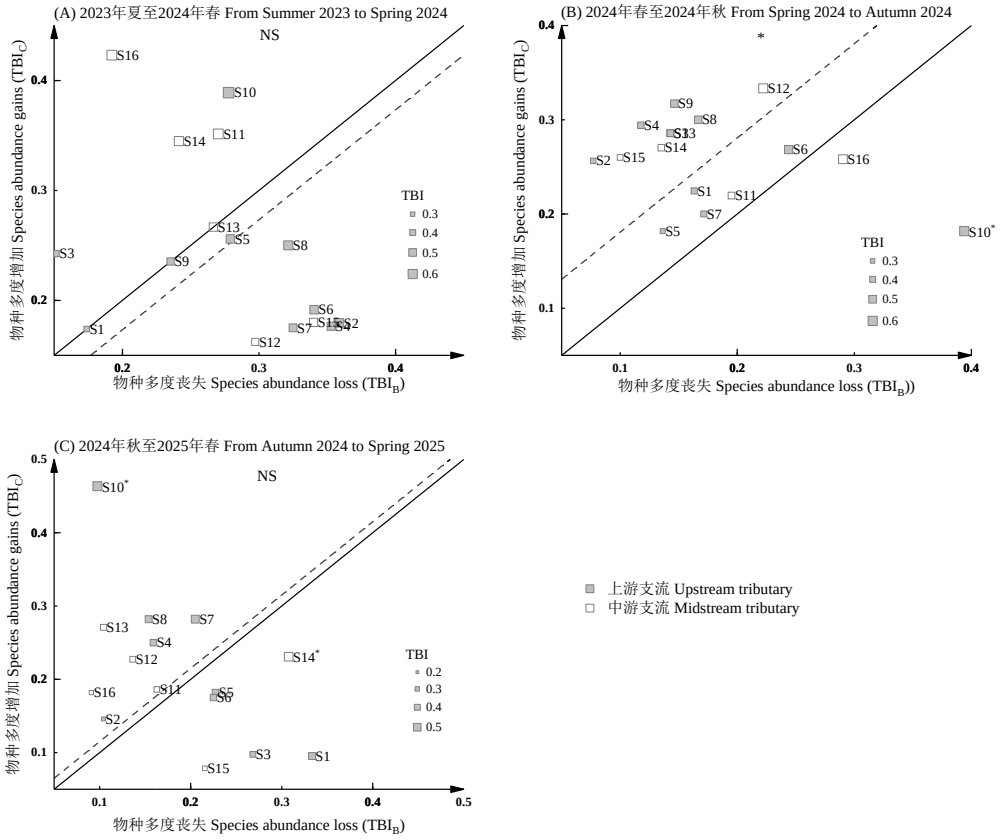


附录1 青弋江支流底栖动物时空**beta**多样性分布。**(A)**平均空间**beta**多样性; **(B)**研究全时段时间**beta**多样性。+表示物种多度增加, –表示物种多度丧失。

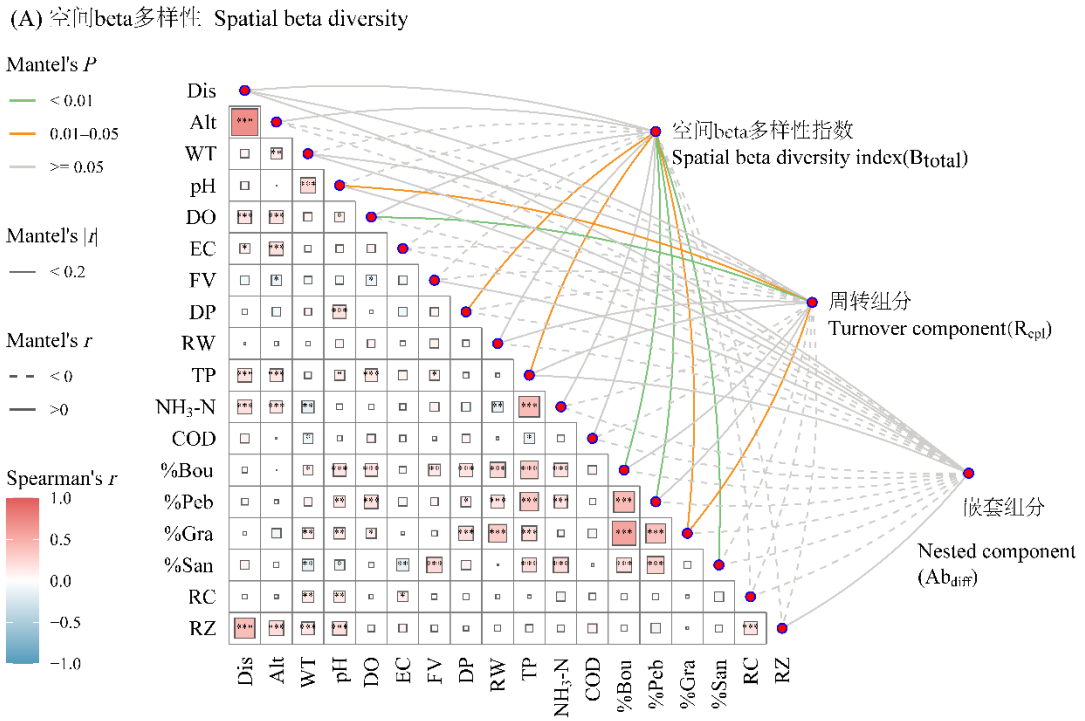
Appendix 1 Spatiotemporal beta diversity distribution of macroinvertebrate in the Qingyi River tributaries. (A) Average spatial beta diversity; (B) Total temporal beta diversity index across the whole study period. + denotes species abundance gain, – denotes species abundance loss.

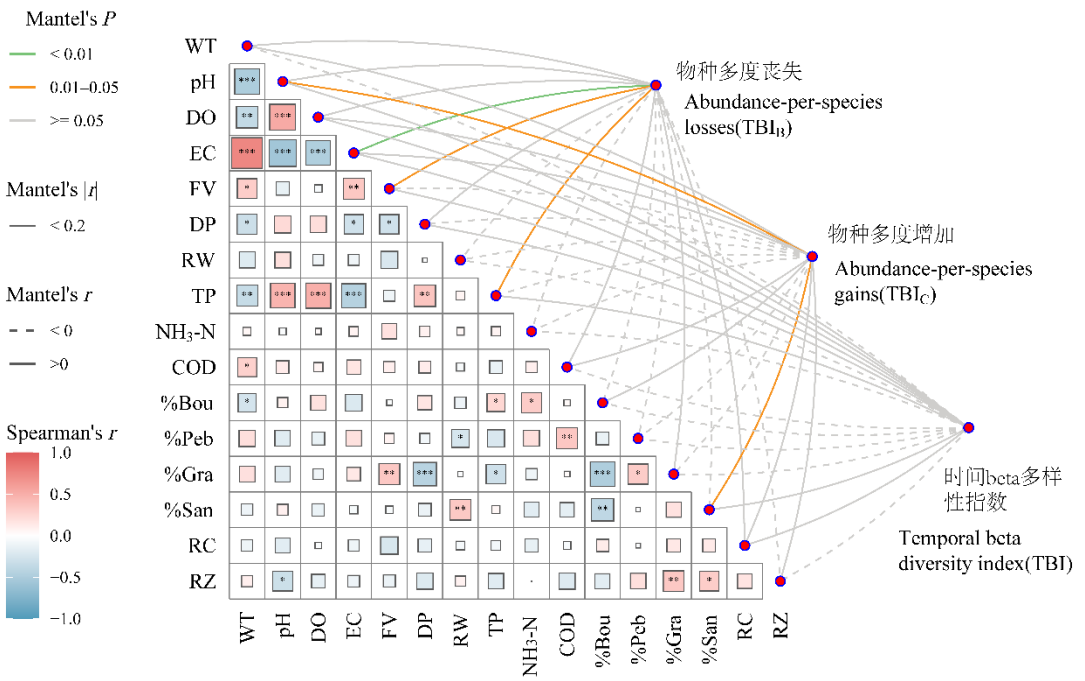
徐光来, 叶文郡, 田柳燕, 张婷, 吴顺, 马健维, 武宗帝, 张寒旭, 池建宇 (2026) 青弋江支流大型底栖动物时空 beta 多样性及影响因素. 生物多样性, 34, 26024. https://www.biodiversity-science.net/CN/10.17520/biods.2026024



附录2 青弋江支流底栖动物分时段时间**beta**多样性。实线为**1**:**1**线, 虚线为平行于实线的平均变化率线; 虚线位于实线以下表示总体以物种多度丧失占主导, 虚线位于实线以上表示总体以物种多度增加占主导; **NS**表示总体没有显著差异; * ***P*** **< 0.05**。

Appendix 2 Temporal beta diversity of macroinvertebrate in the Qingyi River tributaries across different time periods. The solid line represents the 1:1 line, and the dashed line is parallel to it, indicating the mean rate of change. When the dashed line falls below the solid line, species abundance loss predominates; when it lies above, abundance gain predominates; NS, No statistical difference overall; * $P < 0.05$.

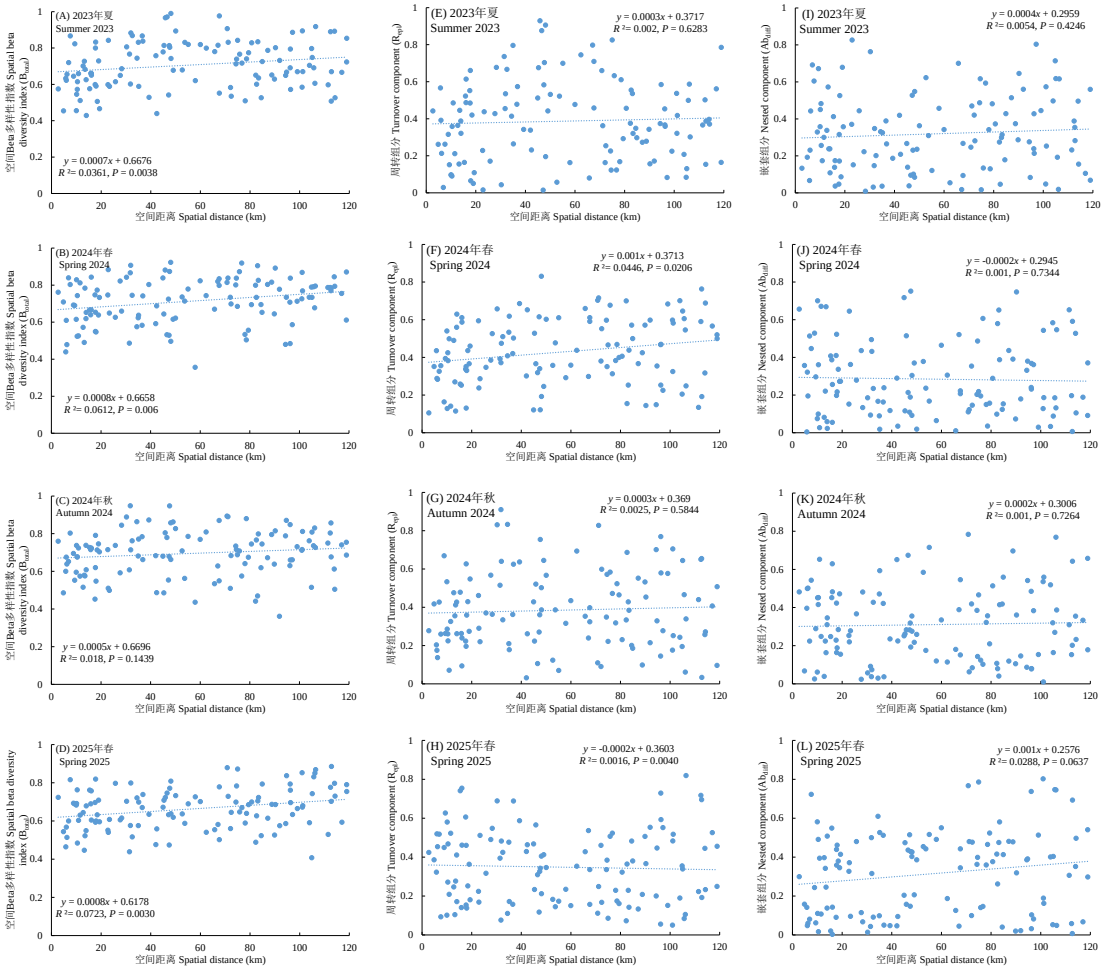




附录3 环境因子与青弋江支流底栖动物时空**beta**多样性指数的**Mantel**检验。* ***P* < 0.05**; ** ***P*< 0.01**; *** ***P* < 0.001**。Dis: 空间距离; Alt: 高程; WT: 水温; DO: 溶解氧; EC: 电导率; FV: 流速; DP: 水深; RW: 河宽; TP: 总磷; NH_3-N: 氨氮; COD: 化学需氧量; %Bou: 巨石百分比; %Peb: 卵石百分比; %Gra: 砾石百分比; %San: 沙和淤泥百分比; RC: 河道; RZ: 河岸带。

Appendix 3 Mantel test between environmental factors and spatiotemporal beta diversity index of macroinvertebrates in the Qingyi River tributaries. * P < 0.05; ** P < 0.01; *** P < 0.001. Dis, Spatial distance; Alt, Altitude; WT, Water temperature; DO, Dissolved oxygen; EC, Electrical conductivity; FV, Flow velocity; DP, Water depth; RW, River width; TP, Total phosphorus; NH_3-N, Ammonia nitrogen; COD, Chemical oxygen demand; %Bou, Percent boulders; %Peb, Percent pebbles; %Gra, Percent gravel; %San, Percent sand and silt; RC, River channel; RZ, Riparian zone.

徐光来, 叶文郡, 田柳燕, 张婷, 吴顺, 马健维, 武宗帝, 张寒旭, 池建宇 (2026) 青弋江支流大型底栖动物时空 beta 多样性及影响因素. 生物多样性, 34, 26024. https://www.biodiversity-science.net/CN/10.17520/biods.2026024



附录4　空间beta多样性及其组分与空间距离的相关性

Appendix 4　Correlation between spatial beta diversity and its components and spatial distance