

# **Spatial and Temporal Patterns of Macroinvertebrate Assemblages in the River Po Catchment (Northern Italy)**

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**Table S1** Macroinvertebrate functional traits examined within this study, with biological traits in non-italicized text and ecological traits being italicized.

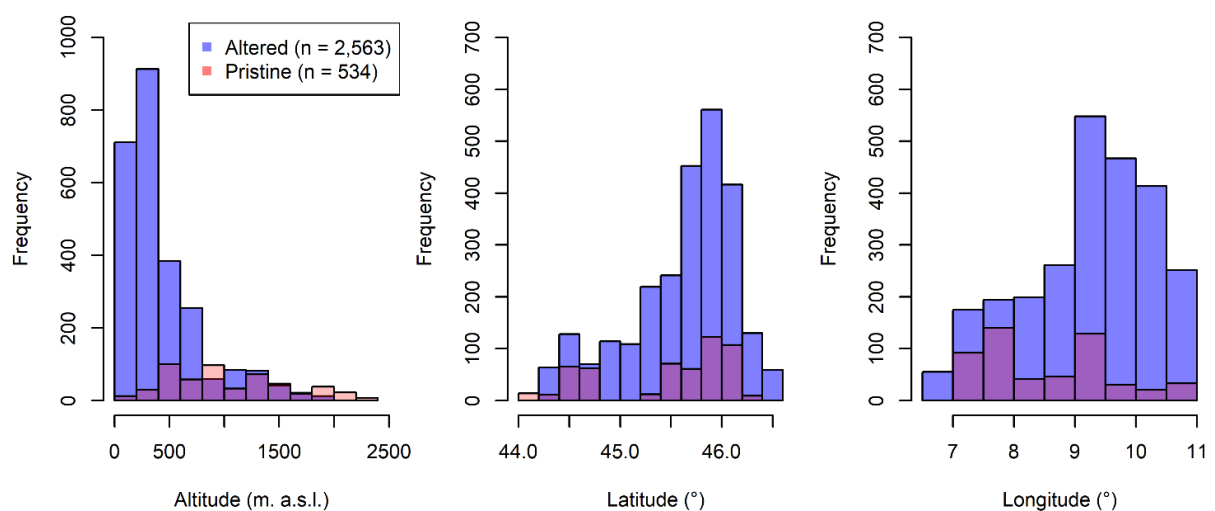
<b>Grouping feature</b>	<b>Trait</b>
<i>Longitudinal distribution</i>	<i>crenon</i>
	<i>epirithron</i>
	<i>metarithron</i>
	<i>hyporithron</i>
	<i>epipotamon</i>
	<i>metapotamon</i>
	<i>outside river system</i>
<i>Transversal distribution</i>	<i>river channel</i>
	<i>banks, connected side-arms</i>
	<i>ponds, pools, disconnected side-arms</i>
	<i>marshes, peat bogs</i>
	<i>temporary waters</i>
	<i>lakes</i>
	<i>groundwaters</i>
<i>Altitudinal preferences</i>	<i>lowlands (&lt; 1000 m)</i>
	<i>piedmont level (1000 - 2000 m)</i>
	<i>alpine level (&gt; 2000 m)</i>
<i>Substrate preference</i>	<i>flags/boulders/cobbles/pebbles</i>
	<i>gravel</i>
	<i>sand</i>
	<i>silt</i>
	<i>macrophytes</i>
	<i>microphytes</i>
	<i>twigs/roots</i>
	<i>organic detritus/litter</i>
	<i>mud</i>
<i>Current velocity preference</i>	<i>null (&lt; 0.05 m*s<sup>-1</sup>)</i>
	<i>slow (0.05 – 0.25 m*s<sup>-1</sup>)</i>
	<i>medium (0.25 – 0.50 m*s<sup>-1</sup>)</i>
	<i>fast (&gt; 0.50 m*s<sup>-1</sup>)</i>
<i>Temperature preference</i>	<i>psychrophilic (&lt; 15°C)</i>
	<i>thermophilic (&gt; 15°C)</i>
	<i>eurythermic</i>
<i>pH preference</i>	<i>pH less than 4</i>
	<i>pH between 4 and 4.5</i>
	<i>pH between 4.5 and 5</i>
	<i>pH between 5 and 5.5</i>
	<i>pH between 5.5 and 6</i>
	<i>pH greater than 6</i>
<i>Salinity preference</i>	<i>fresh water</i>
	<i>brackish water</i>
<i>Saprobic preference</i>	<i>xenosaprobic</i>
	<i>oligosaprobic</i>
	<i>b-mesosaprobic</i>
	<i>a-mesosaprobic</i>
	<i>polysaprobic</i>

**Table S1** (continued) Macroinvertebrate functional traits examined within this study, with biological traits in non-italicized text and ecological traits being italicized.

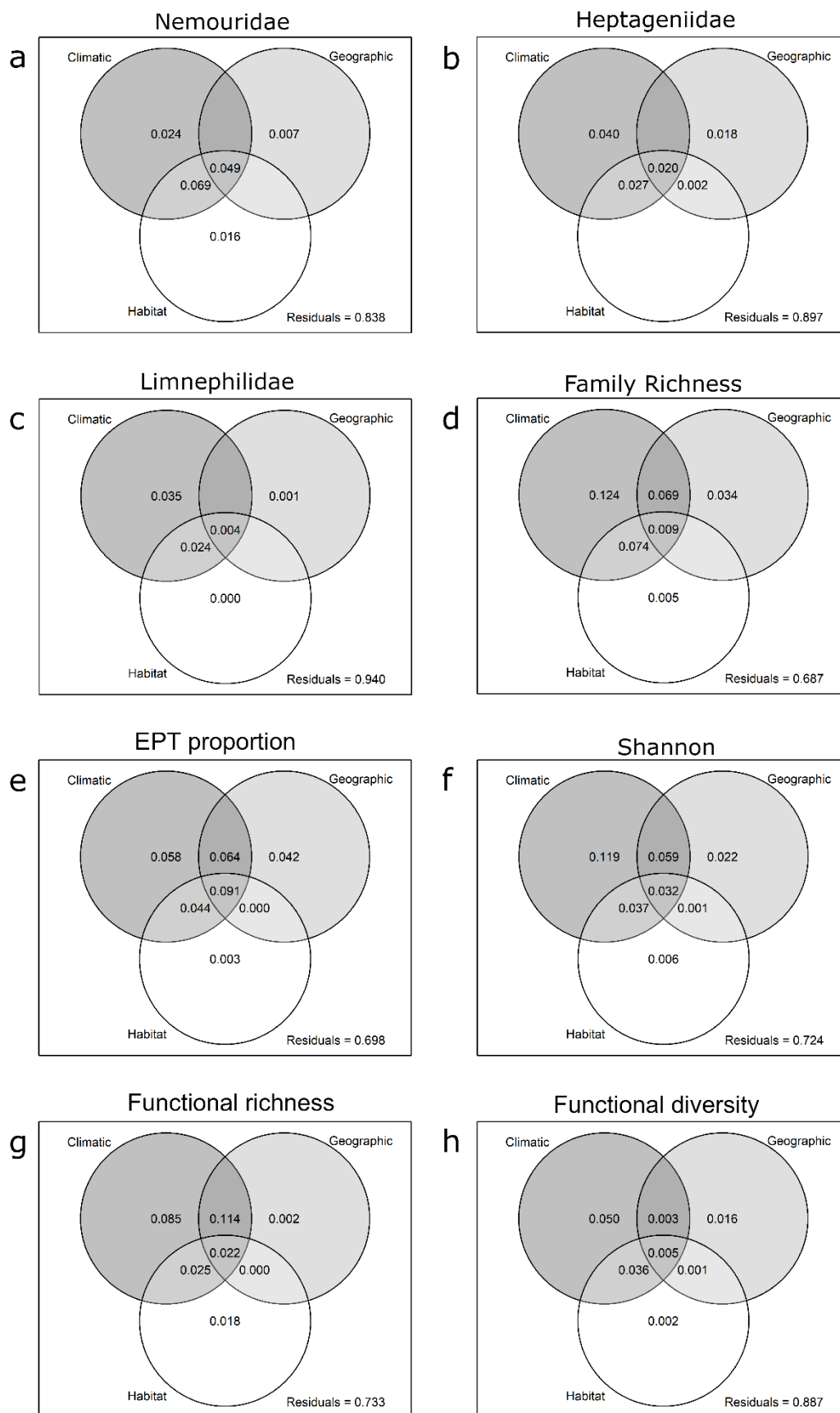
Grouping feature	Trait
<i>Trophic status preference</i>	<i>oligotrophic</i>
	<i>mesotrophic</i>
	<i>eutrophic</i>
Food	fine sediment + microorganisms
	fine detritus ( $\leq 1\text{mm}$ )
	dead plant ( $> 1\text{mm}$ )
	living microphytes
	living macrophytes
	dead animal ( $> 1\text{mm}$ )
	living microinvertebrates
	living macroinvertebrates
	vertebrates
Feeding habits	absorber
	deposit feeder
	shredder
	scraper
	filter-feeder
	piercer (plants or animals)
	predator (carver/engulfer/swallower)
	parasite
Locomotion and substrate relation	flier
	surface swimmer
	full water swimmer
	crawler
	burrower (epibenthic)
	interstitial (endobenthic)
	temporarily attached
	permanently attached
Respiration	tegument
	gill
	plastron
	spiracle (aerial)
	hydrostatic vesicle (aerial)
Maximal potential size	$\leq 0.25\text{ cm}$
	$> 0.25 - 0.5\text{ cm}$
	$> 0.5 - 1\text{ cm}$
	$> 1 - 2\text{ cm}$
	$> 2 - 4\text{ cm}$
	$> 4 - 8\text{ cm}$
	$> 8\text{ cm}$
Resistance forms	eggs, gemmula, statoblasts
	cocoons
	housings against desiccation
	diapause or dormancy
	none

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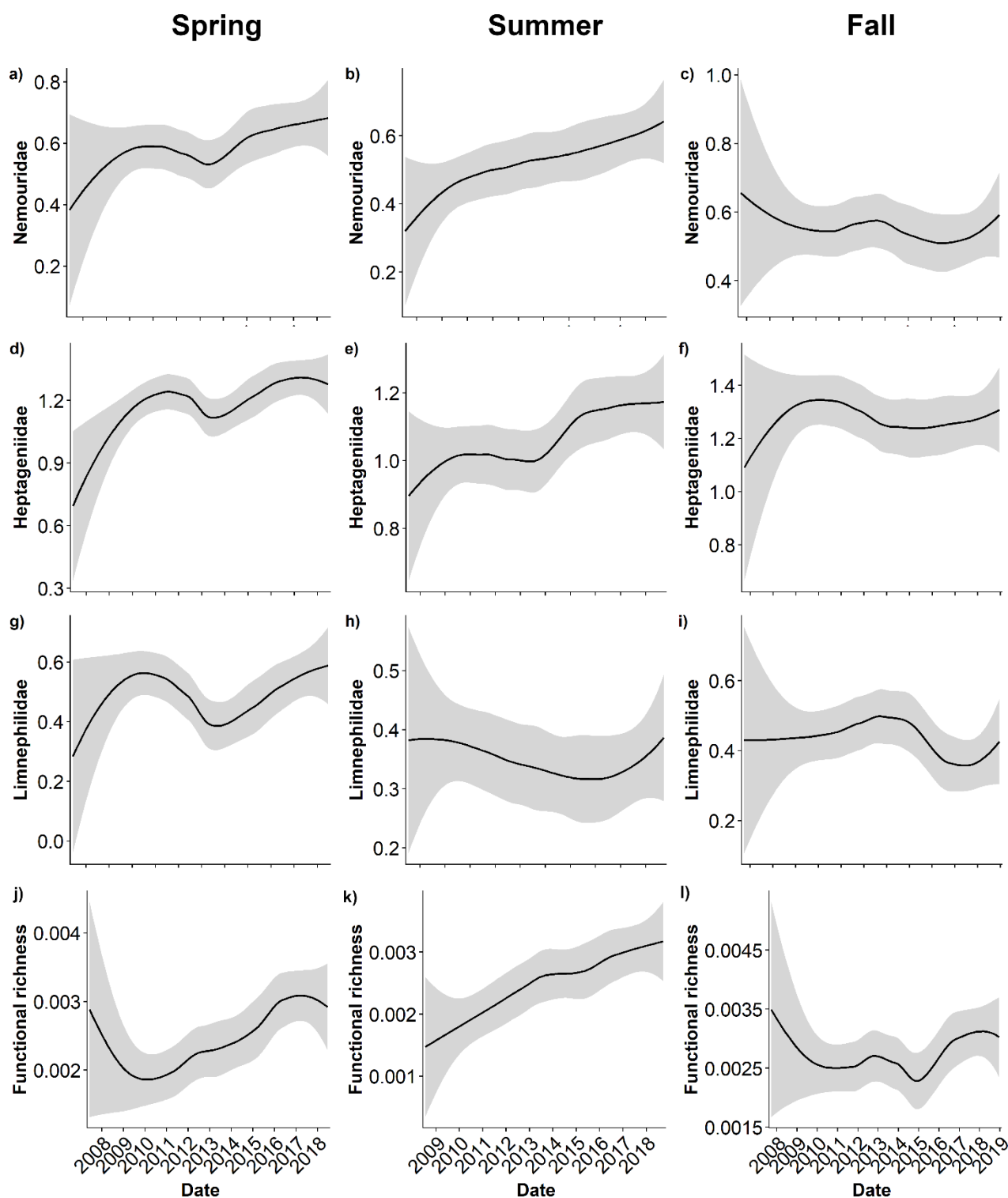
Grouping feature	Trait
Dispersal	aquatic passive
	aquatic active
	aerial passive
	aerial active
Aquatic stages	egg
	larva
	nymph / pupa
	adult
Life cycle duration	$\leq 1$ year
	$> 1$ year
Potential number of cycles per year	life cycle lasts at least two years (semivoltine)
	one generation per year (monovoltine)
	more than two generations per year (polyvoltine)
Reproduction	ovoviviparity
	isolated eggs, free
	isolated eggs, cemented
	clutches, cemented or fixed
	clutches, free
	clutches, in vegetation
	clutches, terrestrial
	asexual reproduction



**Figure S1** Distribution of pristine and altered sites along the geographic gradients.



**Figure S2** Results of variance partitioning on macroinvertebrate metrics and indices. Values displayed are the adjusted  $R^2$  and negative values are not shown. The unexplained portion is shown in the bottom right of panels (Residuals).



**Figure S3** Temporal trajectories of (a, b, c) log<sub>10</sub> transformed Nemouridae absolute abundance, (d, e, f) log<sub>10</sub> transformed Heptageniidae absolute abundance, (g, h, i) log<sub>10</sub> transformed Limnephilidae absolute abundance and (j, k, l) Functional Richness visualized using LOESS (Locally Estimated Scatterplot Smoothing) for the different seasons.