

Tectonic reshaping of the biosphere

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The richness of biodiversity is often scrutinized through the lens of mountain belts, because their typical altitudinal and latitudinal expressions provide grounds for solid arguments on the biodiversification mechanisms at play. We carried out a meta-analysis of species range worldwide, and show that regions of high biodiversity cluster in regions that are tectonically active, but not only in mountain belts, and even more strongly in oceans than in continents. Further, biodiversity relates to tectonic strain rates, in other words the rate at which the landscape is remodeled. We contend that it is the time derivative of the physiography (and of its functional characteristics) and not its instantaneous state that dictate the amount of species that a given region may host. The rate at which habitat connectivity is disrupted or the transience of niches seemingly prevails over the longterm stability of dispersal routes and habitat morphologies. Future research should consider the dynamics of the solid Earth as a primordial control on the distribution of species at its surface.

Mots-Clés : biodiversity, tectonics, strain rates