

Title: Human-driven body size reduction in worldwide terrestrial mammal communities

Titolo in italiano: Effetto dell'impatto antropico sul peso corporeo delle comunità di mammiferi terrestri

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Since Bergman's observation that homoeothermic animals increase in size with latitude, body size distribution has been a central focus of macroecological research. More than 160 years later, the so-called Bergman's rule and its causes are still under debate, with a number of different hypotheses proposed. Meanwhile, human activities have led to hundreds of species extinctions, and have narrowed the distribution of many of the remaining species.

We assess the extent to which human impact has shaped the current distribution of body size in mammalian community. We used a comprehensive set of ecological, climatic and anthropogenic variables to predict the body size values observed in 1-degree grid cells covering terrestrial land. We then explored how model's predictions are affected by the inclusion of human impact variables, and identified areas where predicted body size is lower than expected due to human impact.

Our model suggests that human impact has led to a general reduction in body size of terrestrial mammal communities. Mean and maximum body size predicted in grid cells would be much higher removing the effect of human impact variables, especially in the Afrotropical and Oriental regions. Our study supports previous findings on the pervasive effects of human impact on nature, and confirms the human-induced distortion of global macroecological patterns. While in the short-term human impact is causing species decline and extinction, in the longer term it is causing a broader structural re-shaping of animal communities with yet unpredicted ecological implications.