Supplementary figures

Figure S1. Phylogenetic richness metrics between little urbanised (black bars), moderately-urbanised (dark grey) and highly-urbanised environments (pale grey). Regions in which one of these three habitats was missing have been excluded. PD is in million years.

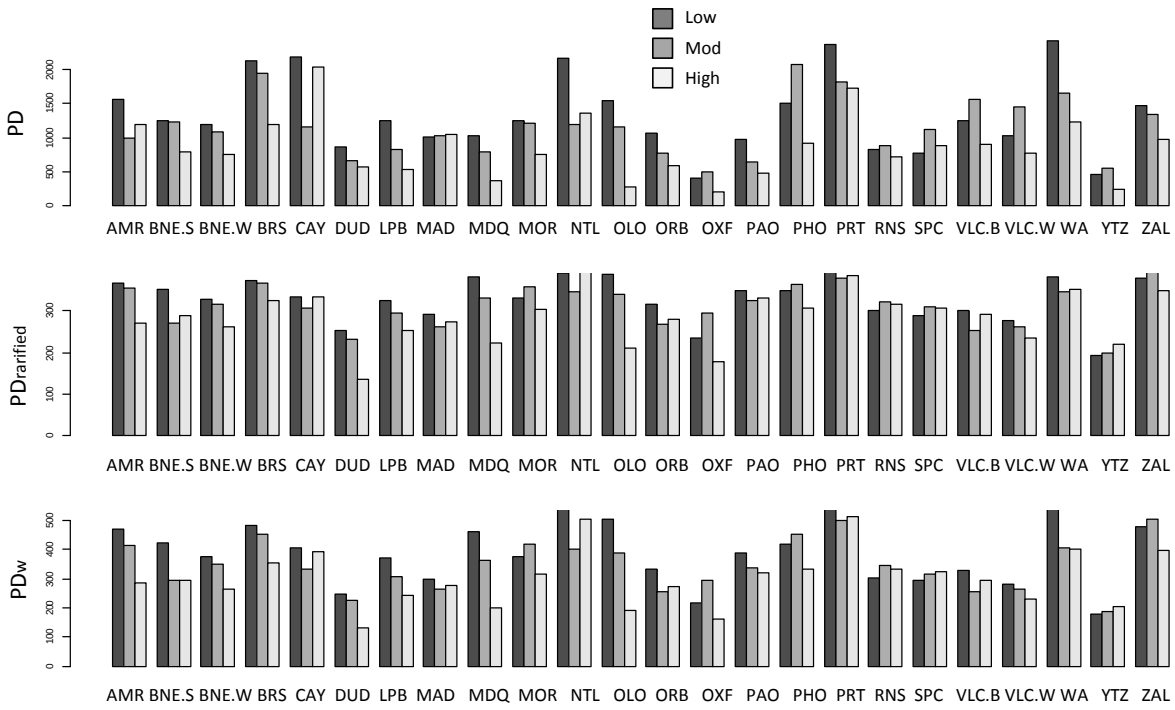

Figure S2. Consistency in PD estimated in different years. Only regions for which the surveys were available for two or more years are included.

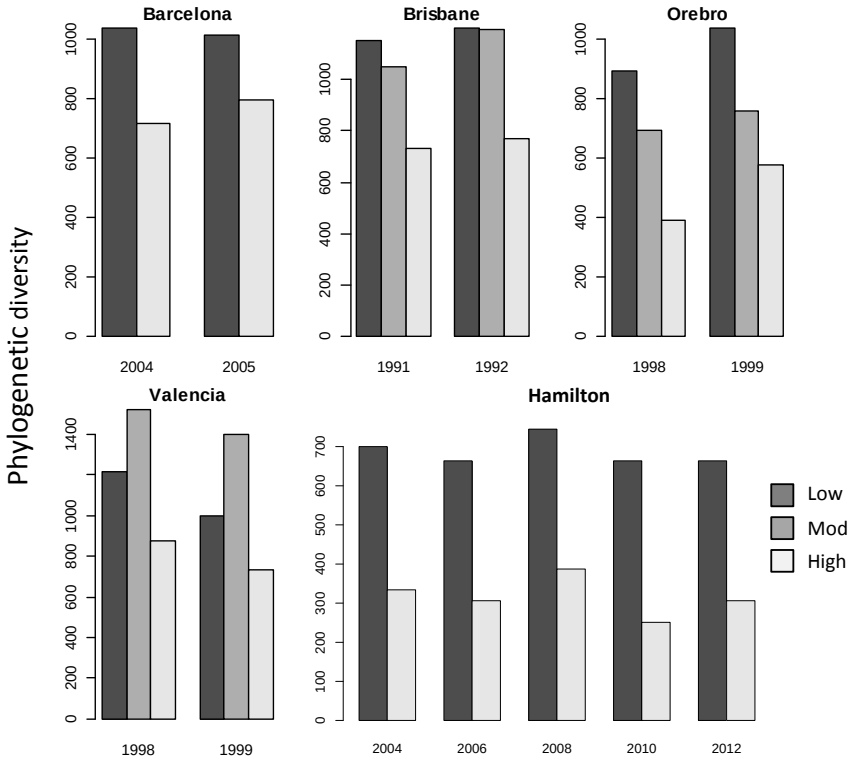

Figure S3. Mean effect size and confidence intervals in PD along urbanisation gradients estimated with MCMCglmms across 50 random selected phylogenies.

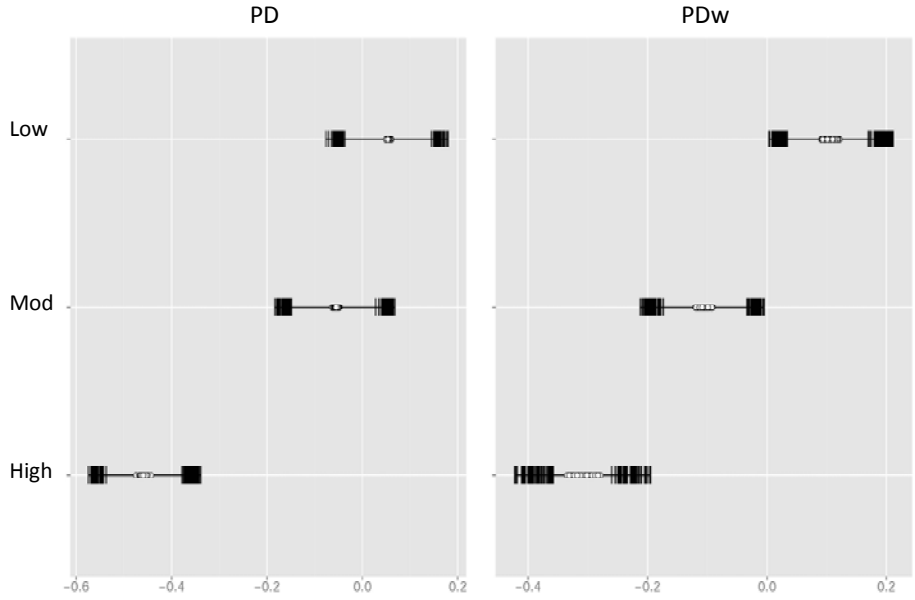

Figure S4. Mean effect size differences (and associated CI interval) in PD across habitats estimated with MCMCglmm. Solid lines describe values larger than zero, indicating that little urbanised habitats exhibit higher PD than Highly-urbanised environments. Discontinuous lines indicate that the difference is non-significant (the estimated effect overlaps with zero). Abbreviations: Wood = woodland, Grass = grassland.

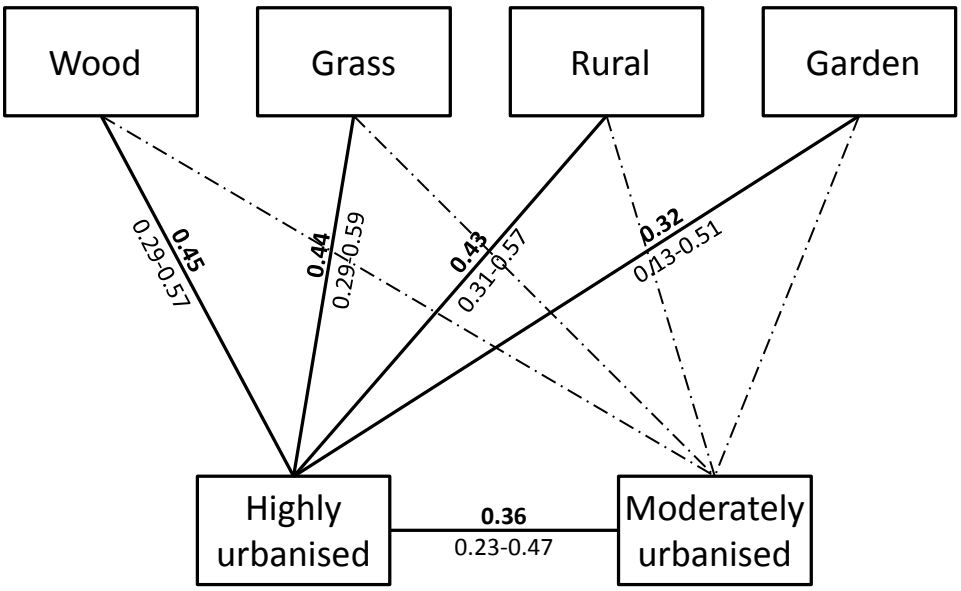

Figure S5. UniFrac Beta diversity index comparing differences between different habitats (above) and how beta diversity across urban and surrounding little urbanised environments is affected by turnover and nestedness (below). High = highly-urbanised, Mod = moderately-urbanised, Low = little urbanised; see Table S4 for formal analyses.

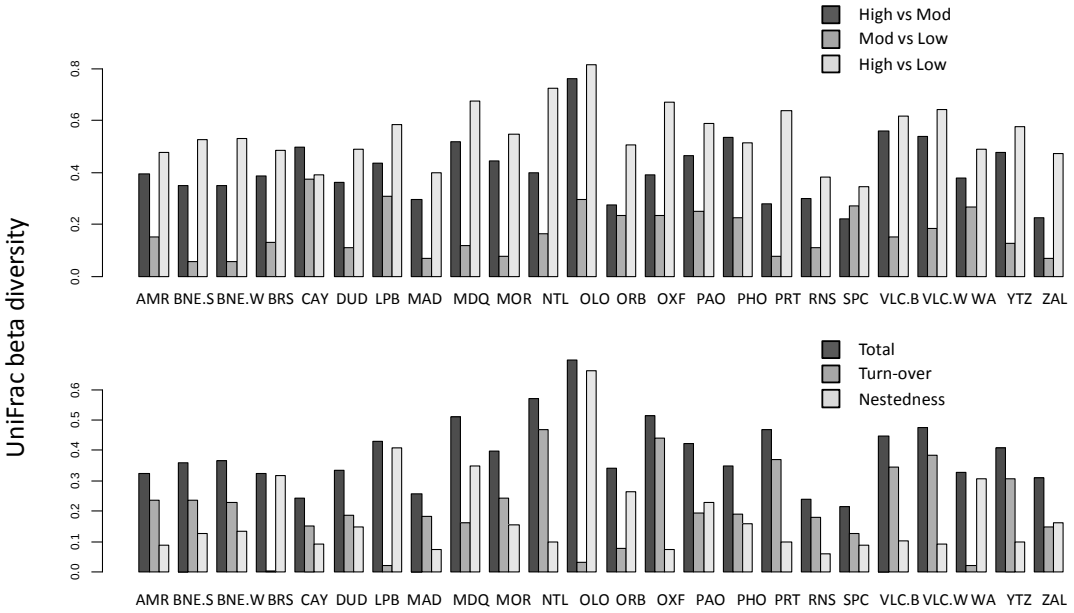

Figure S6. Contribution to phylogenetic diversity, measured as evolutionary distinctiveness based on the regional avian phylogeny, by native exploiters, native non-exploiters and exotic species in highly urbanised environments (above) and moderately urbanised environments (below). Each number in the x-axis corresponds to an assemblage, as described in Appendix S3).

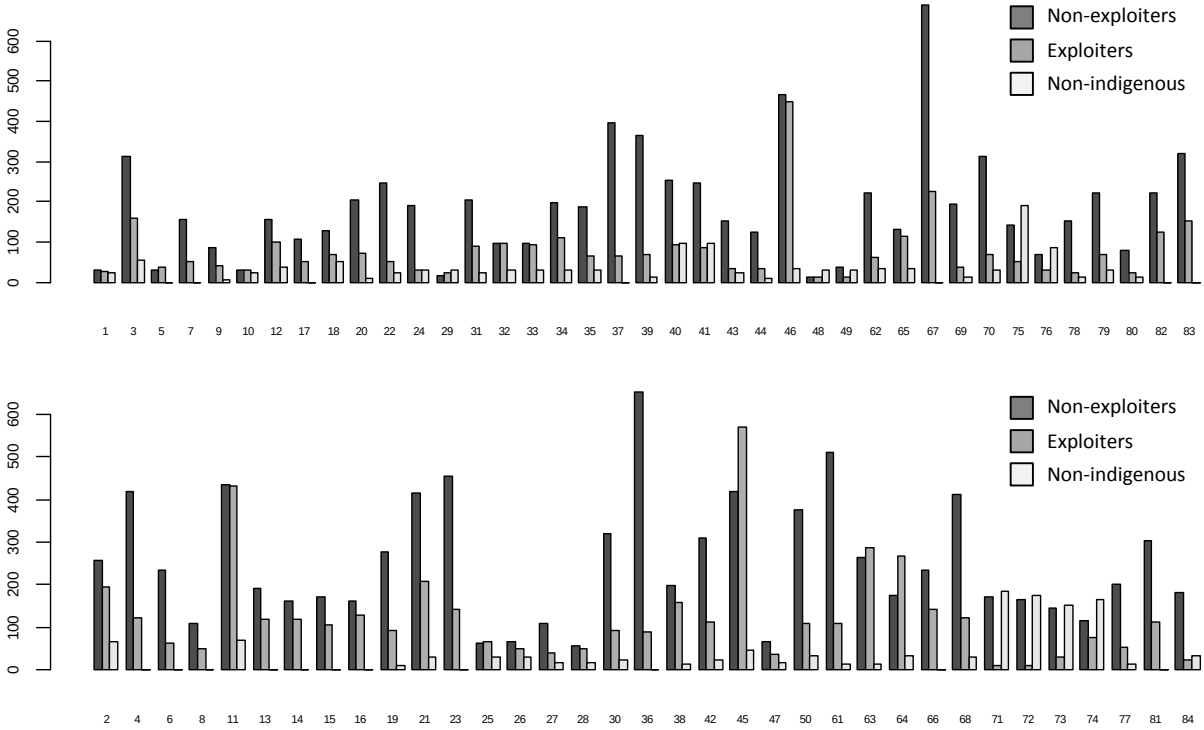

Figure S7. Piecewise structural equation modelling to investigate the influence of species richness on the differences in PD (above) and ED (below) across urbanisation gradients (HAB), while taking into account the influence of geographic longitude. Applying the concept of d-separation, we translated the minimum set of conditional independence for each path model into a set of Gaussian mixed models (with region as random factor) to estimate the significance of all independence claims. The resulting P-values were then used to estimate the Fisher's C, which tells whether the hypothesized relationships are considered to be consistent with the data, and the AICc, as implemented in the R package PIECEWISESEM (Lefcheck 2016). The geographic longitude was included in the models to account for geographic trends.

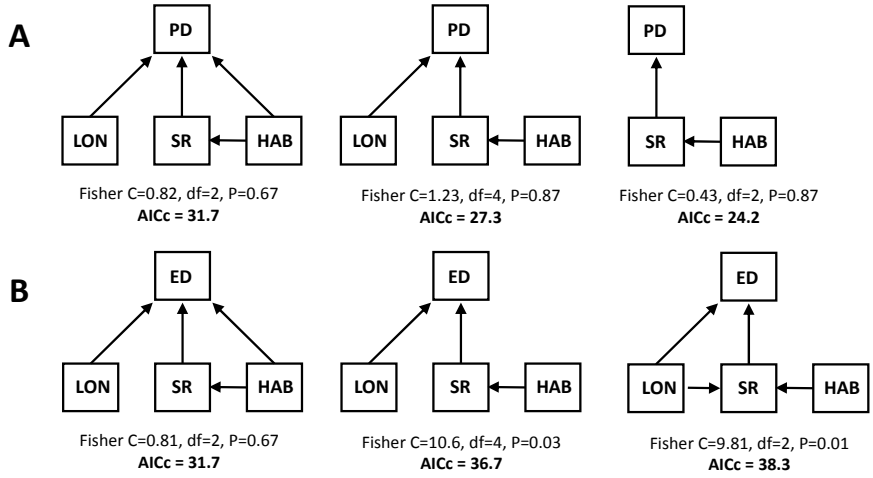

Figure S8. Phylogenetic effects in the tolerance to urbanisation estimated by the D statistic proposed by Fritz & Purvis (2010). Each graph represents a different measure of tolerance to urbanisation (see Methods for details). The blue and red lines show the distributions of D values respectively simulated under models of random association and a Brownian process. The vertical black line in the middle of both distributions indicates the value estimated for tolerance to urbanisation (exploiters vs non-exploiters). The D statistic is 1 if the observed trait has a phylogenetically random distribution across the tips of the phylogeny and 0 if the observed trait is as clumped as if it had evolved by Brownian motion under (Fritz & Purvis 2010). The estimated statistic D was smaller than expected under a phylogenetically random distribution and higher than expected under a Brownian model regardless of the urbanisation tolerance metric used ($P < 0.0001$ in all cases). This suggests phylogenetic effects.

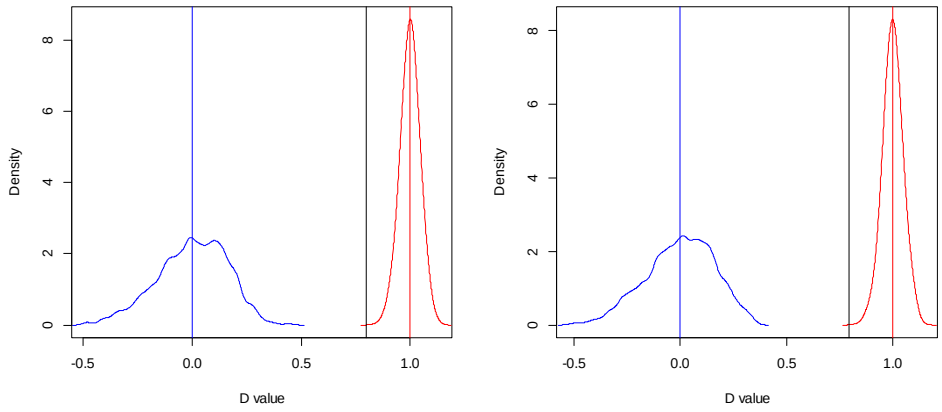

Figure S9. Reconstructions of tolerance to urbanisation (exploiters in purple and non-exploiters in blue) based on character stochastic mapping (100 phylogenies, 10 reconstructions for each phylogeny).

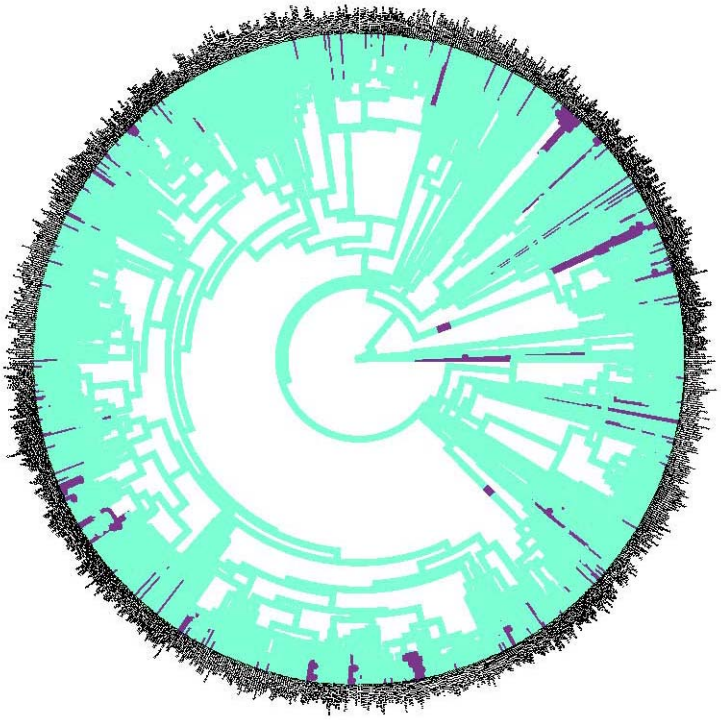

Figure S10. Differences in PD, PDrarefied and PDw among little urbanised (low), moderately urbanised (mod) and highly urbanised (high) habitats for all species (native and exotic). Letters indicate differences among habitats at $P < 0.05$ (see detailed results in Table S13).