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Appendix A1

Estimating species level seed mass from the average mass of the genus

In many cases functional trait data is expensive or logistically difficult to collect. One trait for which data is particularly scarce is seed mass (mg). There is a paucity of seed mass data for climbing plants in existing databases which makes large scale comparisons particularly problematic.

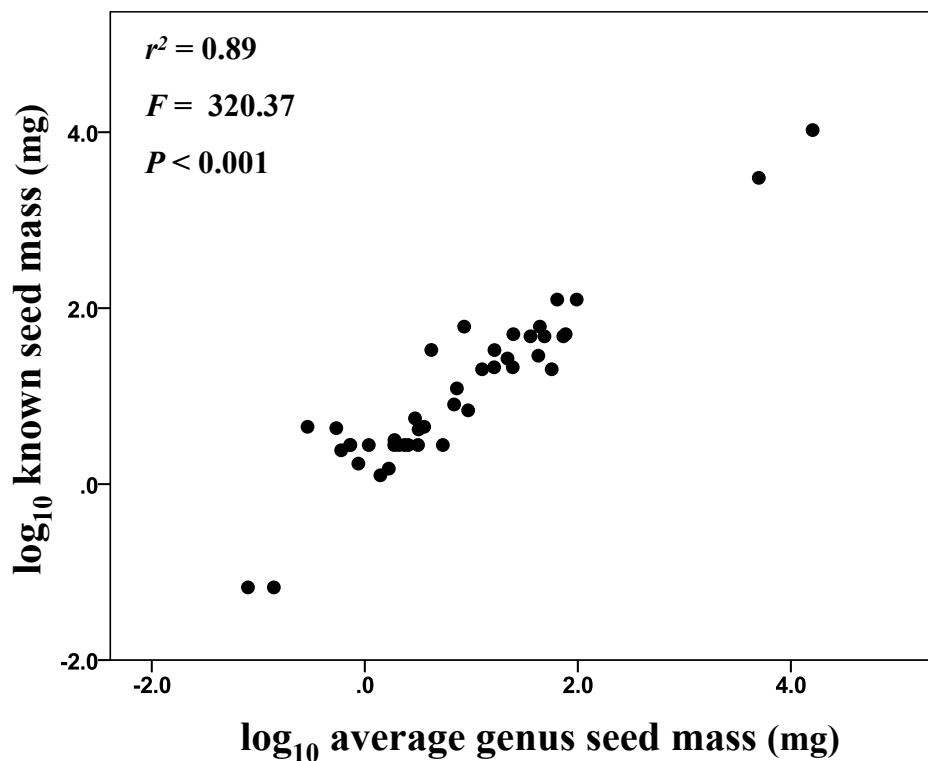
In order to address this shortfall we developed a method for estimating the seed mass of species from the average seed mass of their genus. Using the species in our dataset for which dry seed mass measurements were available from the Kew Seed Information Database (SID) (Liu et al. 2008) we developed a linear model to predict the mass of a seed from the average mass of seeds in its genus. Only genera in which seed mass for 10% or more of the species was available were used in the calculations.

Material and methods

- 1) The number of species for which seed mass data were available in each genus for species missing seed mass data in our dataset and the average seed mass of the genus were collated from data downloaded from SID.
- 2) The number of species in each genus was compiled from published floras for Australia – the Flora of New South Wales (Harden 2004), the Flora of Australia (George et al. 1982).
- 3) Those genera represented by <10% of the total number of species in the genus were removed.

- 4) Average seed mass data for species with a known seed mass in SID were matched (n =43).
- 5) Seed mass data (known and genus level) were \log_{10} transformed.
- 6) A linear regression model was used to predict known seed mass from mean seed mass of the genus in SPSS 16.0.1 (SPSS Inc.). The regression equation was:
$$\log(\text{seed mass}) = 0.864 \times \log_{10}(\text{average seed mass}) + 0.280$$
- 7) The regression equation was used to estimate the seed mass of the remaining 115 species.

Figure 1. The relationship between average seed mass of the genus and known seed mass for 45 species of climbing plant in Australia.



References

- George, A. S. et al. 1982. Flora of Australia. – Australian Government Publishing Service, Canberra.
- Harden, G. J. 2004. Flora of New South Wales. – Univ. of New South Wales Press, Sydney.
- Liu, K. et al. 2008. Seed Information Database (rel. 7.1, May 2008)
<www.kew.org/data/sid>