**Demographic data for *Ischnura elegans* for RangeShifter**

Notes from Erik Svensson

As for the parameters for the model, I comment briefly on them below:

* Fecundity - yes, we have those in some of our papers, including the one from 2012, but also later papers, at least one with Beatriz as first author. Will check and let you know.
* Longevity / generation times Down in Skåne, 1 year, although a minority take two years and a few (1-5 %) emerge already in the first season
* Survival (of adults and larvae if possible) Tricky. We have estimates of adult survival from the immature to sexual maturity in mesocosm cages (see Svensson et al. 2020 Ecology Letters) but I do not remember if we presented those in this paper. But we can calculate it, if you want, although there will be huge variance. As for survival of eggs, we also have (unpublished) estimates that we have not calculated, but the per-capita chance that an egg produces an adult is usually below 10 %, but sometimes up to 15 % (in outdoor tanks) and could be as low as 1%. The higher estimates come from predator-free mesocosms (outdoor tanks). We have also unpublished estimates of r ("the Malthusian parameter") in terms of the number of emerging female offspring er reproductive female in the outdoor tanks. It can vary between 1 (or less), but sometimes is up to 20-25. Would more exact estimates be useful?
* Dispersal estimates (distance, kernels, anything) Unfortunately, no such data from Sweden. However, I think data has been published from Iran:

[https://www.tandfonline.com/doi/full/10.1080/01650424.2022.2074044](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.tandfonline.com%2Fdoi%2Ffull%2F10.1080%2F01650424.2022.2074044&data=05%7C02%7Cnicky.lustenhouwer%40abdn.ac.uk%7C277247dbf2724d96759108dc9f51b652%7C8c2b19ad5f9c49d490773ec3cfc52b3f%7C0%7C0%7C638560420527195912%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=KriAS82%2B9y2UwPtZnEXW5baYt4uvIRuHlI0TfYtr5g4%3D&reserved=0)

* Some kind of carrying capacity / the max population size at a pond (or per unit area or something similar)

We have no good data on this, unfortunately, as we capture only a small fraction of all reproductive individuals. What we have are density estimates (no. captures/minutes), that is, how many we catch adjusted for catching effort. Estimating the maximal population size would certainly be something we would like to do, and it will most likely be in the tens of thousands at the larval stage, and in the thousands at the adult stage. But difficult to provide more exact estimates without a proper mark-recapture study in the field (which should be done at some point).

Other resources:

Fecundity:

* (Svensson & Abbott, 2005): by female morph [Sweden]
* We also have scans of eggs layed by females in Sweden

Dispersal:

* Dudaniec et al. 2022 (see Papers and FieldData folders) --> genetically based dispersal distances, estimated from migrants between populations.
* (Conrad et al., 2002): dispersal distances [UK]
* (Conrad et al., 1999): dispersal kernel (based on recaptures) [UK]
* (Gall et al., 2017): dispersal between urban/rural ponds [France]

Survival:

* (Gall et al., 2017) Adult ‘longevity’
* (Hinnekin, 1987) Various longevity data / life tables but very old (1987)

Lots of data on sex ratio if that is useful!

Conrad, K. F., Willson, K. H., Harvey, I. F., Thomas, C. J., & Sherratt, T. N. (1999). Dispersal characteristics of seven odonate species in an agricultural landscape. *Ecography*, *22*(5), 524–531. https://doi.org/10.1111/j.1600-0587.1999.tb01282.x

Conrad, K. F., Willson, K. H., Whitfield, K., Harvey, I. F., Thomas, C. J., & Sherratt, T. N. (2002). Characteristics of dispersing Ischnura elegans and Coenagrion puella (Odonata): Age, sex, size, morph and ectoparasitism. *Ecography*, *25*(4), 439–445. https://doi.org/10.1034/j.1600-0587.2002.250406.x

Gall, M. L., Chaput-Bardy, A., & Husté, A. (2017). Context-dependent local movements of the blue-tailed damselfly, Ischnura elegans: Effects of pond characteristics and the landscape matrix. *Journal of Insect Conservation*, *21*(2), 243–256. https://doi.org/10.1007/s10841-017-9971-5

Hinnekin, B. O. N. (1987). *Population dynamics of Ischnura E. elegans (Vander Linden) (Insecta: Odonata) with special reference to morphological colour changes, female polymorphism, multiannual cycles and their influence on behaviour*.

Svensson, E. I., & Abbott, J. (2005). Evolutionary dynamics and population biology of a polymorphic insect. *Journal of Evolutionary Biology*, *18*(6), 1503–1514. https://doi.org/10.1111/j.1420-9101.2005.00946.x