Supplementary methods

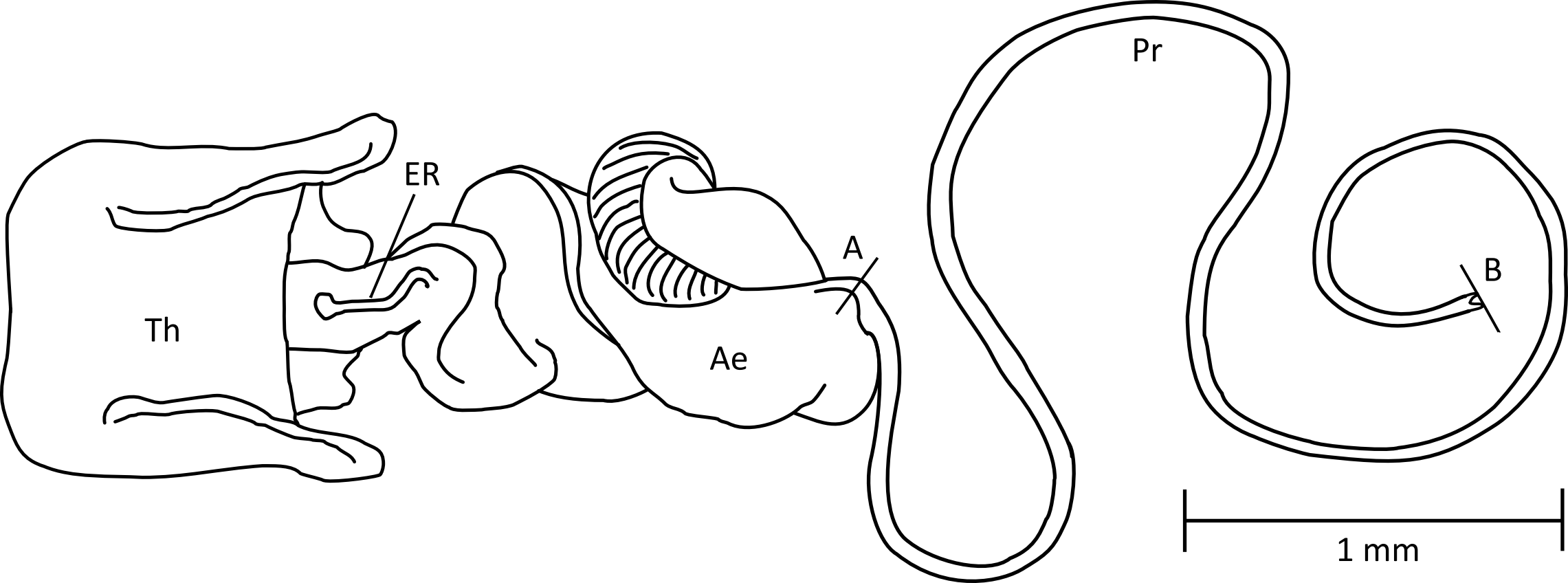
Micro-CT of single male

As well as the mating pair presented in the paper, we also took a third mating pair and interrupted copulation after approximately five minutes, using a fine paintbrush, which caused the male to disengage from the female with his intromittent organ everted from the genital capsule. This mated male was then immediately flash-frozen in liquid nitrogen. This male was stored in 70% ethanol and unstained (as the genitalia are much easier to visualise when outside of the body), and transported with the other samples to the Natural History Museum, London. The scan of the single male was performed using a current/voltage of 95 kV/190 µA and 3142 projections. This gave a dataset with a voxel size of 5.7 µm. Digital visualization was undertaken using the freely available SPIERS software suite. For each scan, a global linear threshold was applied to the dataset, creating binary images in which all pixels brighter than a user-defined grey level were turned “on” (white). The “on” pixels identified as belonging to the bugs were then manually assigned to distinct regions-of-interest, which corresponded to important anatomical characters (e.g. processus, aedaegus or claspers). These regions-of-interest were rendered as separate isosurfaces, producing interactive three-dimensional virtual reconstructions in which the different anatomical structures could be independently manipulated (See online supplementary material). High-quality images and animations were produced in the open-source program Blender (www.blender.org).

Supplementary figure legends

Figure S1. Male genitalia of *Lygaeus simulans*. Processus length was measured from the 'turning point' (Point A) to the tip (Point B). Abbreviations: Th: Theca, Ae: Aedeagus, ER: Ejaculatory reservoir, Pr: Processus.

Figure S2. Reconstructions of external reproductive anatomy of a male *Lygaeus simulans* following mating obtained from micro-CT scanning, showing the paired claspers (blue), fleshy aedeagus (orange/brown) and the long processus (purple).


Th
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1 mm