CASSIDINE BEETLE

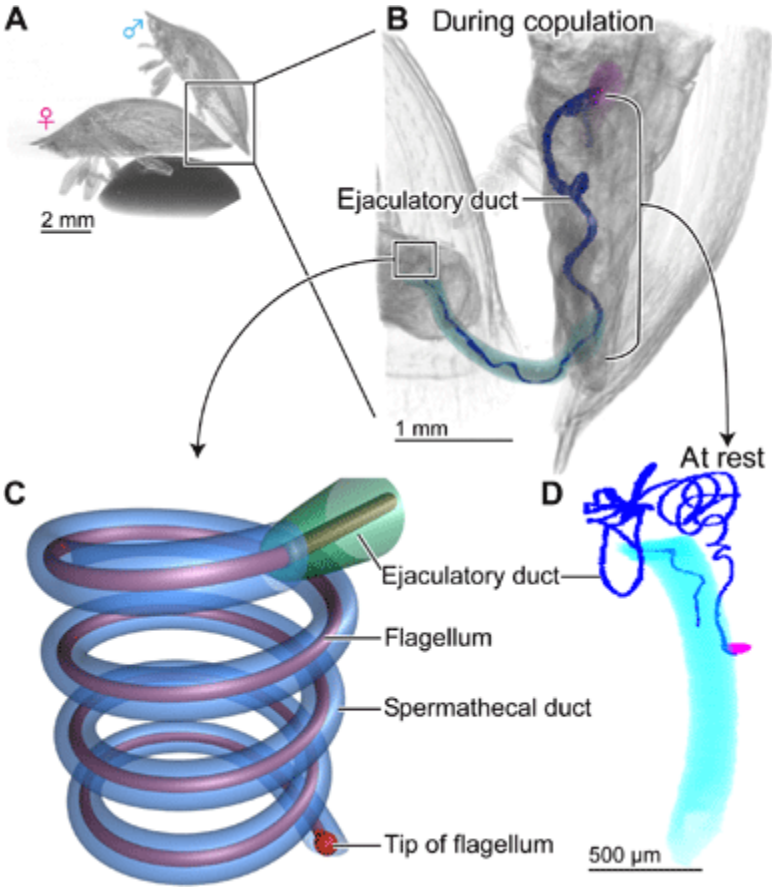

Fig. 1 Genital morphology of *Cassida rubiginosa*.

(**A**) A couple scanned with micro–computed tomography. (**B**) An enlarged image of the abdomen during copulation; different parts of the male reproductive system are shown with different colors. (**C**) A scheme of the flagellum inserted into the spermathecal duct. (**D**) The male genitalia at rest. The flagellum is highlighted with dark blue in (B) and (D). During copulation, a primary intromittent organ (aedeagus, light blue) is inserted in a female vagina, the ejaculatory duct is shortened due to contraction of longitudinal muscles, and the flagellum is propagated to the female spermathecal duct. Figures are modified from the study by Filippov *et al*. (*14*) for (C) and Matsumura *et al*. (*25*) for (A), (B), and (D).

Penetration mechanics of a beetle intromittent organ with bending stiffness gradient and a soft tip

In insects, the entire intromittent organ (general term for an external organ of a male organism that is specialized to deliver sperm during copulation. WikiPedia) is usually stored in the abdomen. Therefore, males have to move the elongated structure for rather long distances to insert the elongated structure from their abdomen into a female duct…(or spermathecal duct)…the correspondingly long female structures are convoluted and/or highly coiled.
http://advances.sciencemag.org/content/3/12/eaao5469.full