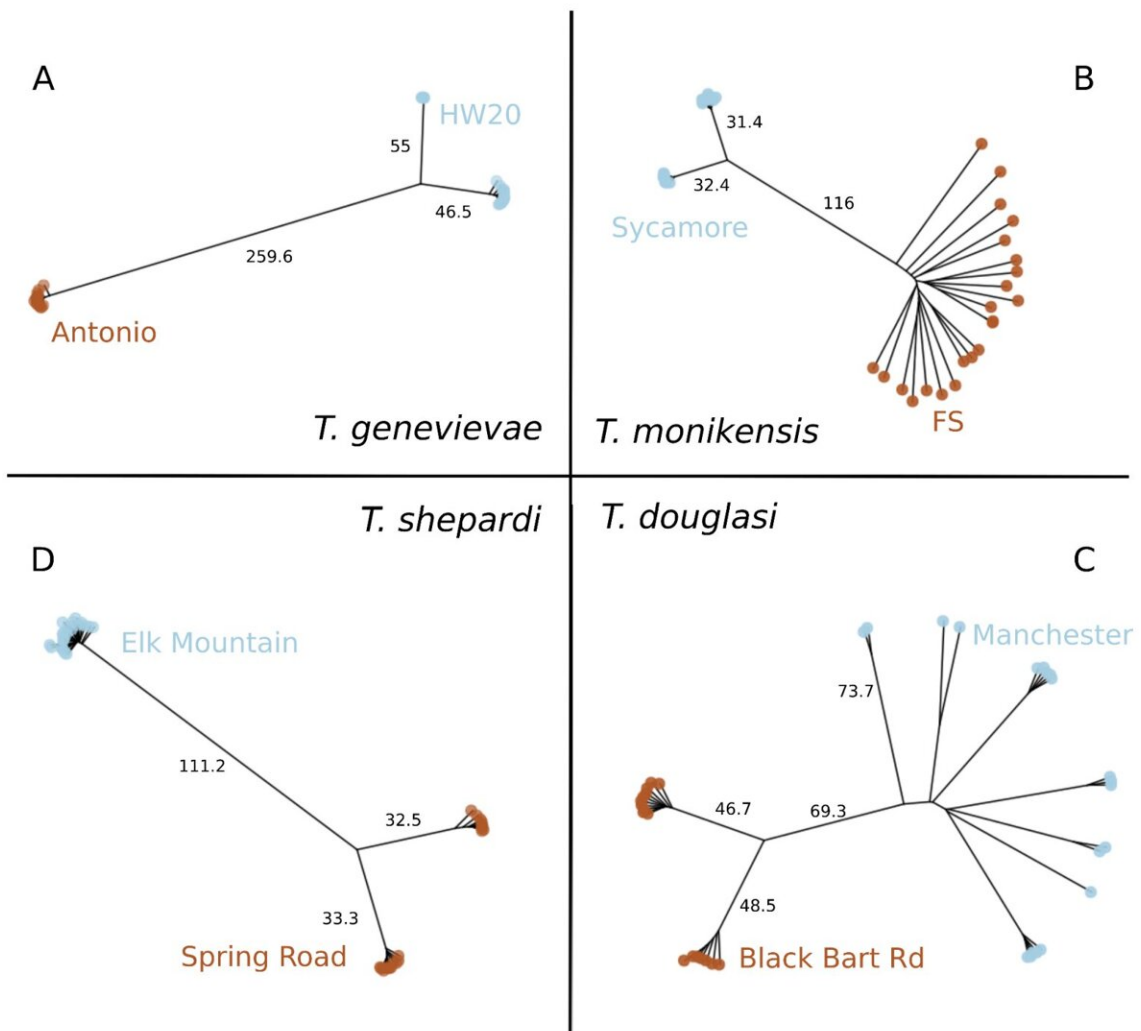


Some stick insects that normally reproduce through parthenogenesis found to mate on occasion

September 20 2023, by Bob Yirka



Neighbour-joining networks of pairwise distances between individuals within parthenogenetic *Timema* species: A. *T. genevieveae*. B. *T. monikensis*. C. *T. douglasi*. D. *T. shepardi*. Individuals of the two studied populations in each species are distinguished by brown and blue labels. Credit: *Proceedings of the Royal Society B: Biological Sciences* (2023). DOI: 10.1098/rspb.2023.0404

A team of ecologists and evolutionary biologists at the University of Lausanne, Switzerland, has found that some normally asexual species of stick insects, which are known to reproduce via parthenogenesis, occasionally mate to enhance the gene pool.

In their paper published in *Proceedings of the Royal Society B*, the group describes how they sequenced the genomes of four species of stick insect that are known to reproduce via parthenogenesis and what they learned by doing so.

Prior research has shown that some species of stick insect, of the genus *Timema*, do not have to mate to produce offspring. They instead reproduce through a process known as parthenogenesis—where a creature reproduces by producing an egg that does not need to be fertilized to mature.

When reproducing this way, such creatures produce near clones of themselves, which means that most of their offspring tend to be female—although there is the rare possibility of a male resulting from this mode of reproduction. Parthenogenesis has been found in some invertebrates (including these species of stick insect) and some plants.

Prior research has also shown that creatures that reproduce via parthenogenesis tend to have less genetic diversity and because of that tend to have more difficulty adjusting to changes in their environment.

In this new effort, the research team was wondering how stick insects might fare in light of global warming. Prior research has suggested that the insects have been reproducing via parthenogenesis for as long as a million years, seemingly making them particularly vulnerable to [climate change](#).

To learn more, they went out into the field and captured multiple samples of four species of stick insects that are already known to reproduce via parthenogenesis. The research team sequenced the genes of eight populations from four stick insect species that rely on parthenogenesis. In six of those populations, they found low genetic diversity, which points towards long periods of uninterrupted [parthenogenesis](#).

However, in two of the populations belonging to the species *Timema douglasi* and *T. monikensis*, Susana Freitas and her team found evidence of more [genetic diversity](#) than should be the case for a creature that reproduces without mating. This suggests that these two species occasionally practice cryptic sex, where fertilization occurs post-mating and tends to have a male bias.

The research team concludes by suggesting their findings indicate that some creatures, such as stick insects, appear to be capable of adapting to [environmental changes](#) by adapting the means by which they reproduce.

More information: Susana Freitas et al, Evidence for cryptic sex in parthenogenetic stick insects of the genus *Timema*, *Proceedings of the Royal Society B: Biological Sciences* (2023). [DOI: 10.1098/rspb.2023.0404](#)

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