

In the absence of sexual prospects, parasitic male worms go spermless

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When females aren't around, one species of parasitic nematode worm doesn't even bother to make any sperm, reveals a new report in the November 11th issue of *Current Biology*, a Cell Press publication.

" This is very unusual for a male to need a female to be present before he produces sperm," said Christine Griffin of the National University of Ireland, Maynooth. "We searched the literature but could find no report of this in any other animal. Animals have evolved all sorts of strategies, some quite bizarre, to increase their lifetime reproductive success, but this particular one does not appear to be common." Lifetime reproductive success refers to the number of offspring produced over the course of a lifetime.

Scientists have generally considered sperm production to be cheap relative to the production of eggs in females, she said. But that notion has been challenged of late in animals that must produce a lot of sperm or particularly large sperm. The males of some other species of rodents, fish, and insects, for example, cut back on sperm according to their social circumstances. But they generally don't go without.

The researchers haven't yet shown how this behavior in the parasitic nematodes known as *Steinernema longicaudum* benefits the males of the species. But, they say, this newly discovered behavior makes some sense in light of the worms' unusual life history.

" Most animals can move around in search of a mate, and so should be

ready to make the most of any opportunities that present themselves," Griffin explained. "Like many parasites, *Steinernema* enter their host insect when they are still juvenile and develop inside. A male that finds himself alone cannot leave the insect to search for a mate." Since only juvenile worms invade insects, those solitary males just have to wait until a young mating prospect joins him and grows up. Under these circumstances, she said, a mating partner can't appear suddenly, leaving the male no reason to be sexually mature.

Griffin's team, which included Lemma Ebssa, now at Rutgers University, made the discovery while studying the reproductive behavior of the nematode. They were surprised to find that it took some time before successful mating occurred between a pair of worms placed together.

"Initially, we thought that perhaps the female was unreceptive and/or immature, as this would be the more normal situation in animals," Griffin said. "However, further experiments showed that it was the male that was unready. We then took a closer look and discovered to our great surprise that the reproductive tract of naive males was smaller than that of males that had been with a female for some time, and it contained no sperm."

The researchers think that the signal from females to mature may be chemical in nature, since lone males matured even when females were placed on the other side of a permeable barrier. (The nematodes don't have eyes with which to see.) The researchers don't yet know whether the pheromones that stimulate male maturity are the same as those that sexually attract him to females.

Source: Cell Press

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