

Worms making Sperm shorten their Life

By Natalie Angier

Researchers found that if sperm-making organs of the male nematode *Caenorhabditis elegans* are inactivated, the worms live longer.

The simple act of making sperm substantially shortens a male worm's life span, a researcher has discovered in results that overturn accepted biological dogma about the relative cheapness of a male's ejaculation compared with the preciousness of a female's egg. The scientist studying simple but revealing worms called nematodes found that males live much shorter lives than their mates, and he has traced that discrepancy to sperm production. When he experimentally manipulated males so that they lost their capacity to make sperms while retaining their taste for intercourse, the altered nematodes lived at least 50 percent longer than the normal, fertile males. The results suggest that creating sperm is far more difficult than scientists had imagined, demanding a diversion of resource that might otherwise go into assuring a male's long-term health. "These results are the last thing I had expected when I started doing the experiment," said Wayne A. Van Voorhies of the university of Arizona in Tucson. "They were so startling that I did the work over four times to make sure I got it right. They basically say a lot of our preconceived notions just do not hold up." Mr. Van Voorhies, a graduate student who expects to receive a doctorate in May, is the sole author of the report, which appear today in the journal *Nature*.

Scientists Astonished

Other scientists familiar with the new work have expressed astonishment at the discovery, and they are unsure what its wider implications may be. Although they strongly caution against interring too much about human life spans from worms no bigger than the comma at the end of this clause, they say that evolution tends to conserve many traits and that it is possible that at least a fraction of the difference in life span between men and women just may be linked to sperm production. Women on average live about six years longer than men. "This is a fascinating and a very clear observation," said Dr. Philip Anderson of the University of Wisconsin in Madison, a scientist who studies the same organism, known as *Caenorhabditis elegans*. "Those of us working with nematodes hold it as an article of faith that the genes and biochemical processes nematodes use are the same as those that humans and other mammals use. But, gosh, I hope it isn't true in this case. It would be awful to make the suggestion that one way to live longer is to castrate yourself at a young age." For the experiments, Mr. Van Voorhies compared the two genders of nematodes, males and the far more common hermaphrodites. Hermaphroditic worms possess both eggs and small amounts of sperm, with which they can fertilize themselves, but when possible they prefer to mate with real males who pass larger amounts of sperm from the testes through the vas deferens. Beginning with ordinary nematodes, Mr. Van Voorhies discovered that when they had enough to eat hermaphrodites live an average of 11.8 days regardless of how much sex they engaged in. Among males, the situation was very different. Those males that were prevented from mating lived about 11.1 days. But when permitted to mate at will, a state of affairs requiring steady sperm production, the males lived only 8.1 days. Mr. Van Voorhies then looked at a manipulated strain of nematodes in which both genders bear a genetic mutation that interferes with sperm creation at its earliest stages. The findings were startling. Freed of the stress of sperm production and still permitted to mate as they please, males survived almost 14 days; the hermaphrodites which still made eggs, lasted 19 days. Mr. Van Voorhies cannot explain the remaining discrepancy between the two life spans. The new work suggests that ceaseless sperm production takes its toll on a male, perhaps requiring the use of complex enzymes or biochemical processes that have harmful metabolic byproducts. Mr. Van Voorhies cautions that among higher animals, females pay other physiological costs of reproduction beyond making nourishing eggs, complicating the application of the new work to human beings. "For a mammal, the major energetic cost to the female is gestation and lactation, not the eggs themselves" he said. "Female mammals definitely bear these brunts of reproduction." Yet for all the wear and tear of pregnancy and breast-feeding, women still have the edge in life span over men.

Making Sperm Shortens Worm's Lives, Scientists Find

The simple act of making sperm substantially shortens a male worm's life span, a researcher has discovered. The finding challenges accepted biological dogma about the relative cheapness of a male's ejaculation compared with the preciousness of a female's egg. The scientist, studying the simple worms called nematodes, found that males live much shorter lives than their mates, and he traced that discrepancy to sperm production. When he experimentally manipulated males so they lost their capacity to make sperm while retaining their taste for intercourse, the altered nematodes lived at least 50 percent longer than the normal, fertile males. The results suggest that creating sperm is far more difficult than scientists had imagined, demanding a diversion of resources that might otherwise go into ensuring a male's long-term health. "These results are the last thing I had expected when I started doing the experiment," said Wayne A. Van Voorhies, a graduate student at the University of Arizona in Tucson. "They basically say a lot of our preconceived notions just do not

hold up.” Other scientists expressed astonishment at the discovery, which is reported today in the journal *Nature*. Although they strongly cautioned against inferring too much about human life spans from worms no bigger than the comma at the end of this clause, they said it is possible that at least a fraction of the difference in life span between men and women just may be linked to sperm production. Women on average live about six years longer than men. This is a fascination and a very clear observation,” said Dr. Philip Anderson of the University of Wisconsin in Madison, who studies the same organism known scientifically as *Caenorhabditis elegans*. “These of us working with nematodes hold it as article of faith that the genes and biochemical processes nematodes use are the same as those that humans and other mammals use. But, gosh, I hope it isn’t true in this case. It would be awful to make the suggestion that one way to live longer is to castrate yourself at a young age.”