

Researchers reveal sexual prowess of older males not to be underestimated

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Credit: University of Otago

Quality sperm, good genes, and courtship knowledge are just a few reasons why females might benefit from mating with older males.

In a study of zebrafish, just published in the prestigious Royal Society journal *Proceedings B*, Dr. Sheri Johnson and University of Otago

colleagues have shown for the first time that older males may indeed be contributing good genes to [offspring](#), perhaps counteracting the decline in fertility they experience as they age.

They used both cross-sectional and longitudinal methods to investigate the impact of male age on mating success, fertility (such as [sperm](#) production and motility), and offspring fitness (such as embryonic development, hatching and survival).

The researchers, funded by a Marsden Fast-start grant, sampled the zebrafish every three months and identified a significant decline in [sperm production](#), sperm swimming speed and total sperm motility as they aged.

But, unexpectedly, they found that older males continued to produce offspring with high hatching rates and very high survival rates.

Lead author Dr. Sheri Johnson, of the Department of Zoology, says: "One of the big paradoxes in evolutionary biology is why so many females mate with older males, when male fertility should decline with age.

"No one had ever taken the combined approach to look at mating behaviour, sperm traits, and offspring fitness as males age and very few have used longitudinal studies.

"The big surprise here is that our work suggests the genetic quality of sperm is not being compromised with age and that older males may deliver good genes.

"What we think is happening is that improvements in offspring fitness may compensate for declining fertility in older males, so females can still benefit from mating with older males and may even secure 'good

genes' benefits."

When males were very young (4-7 months of age, roughly young adults in human terms) they produced offspring with poorer development and there was also a trend towards lower [mating](#) success. Researchers believe this could be due to their smaller size, or their lack of knowledge in courting females.

Dr. Johnson believes zebrafish are a good model for human fertility as early development is very similar.

"Our findings mirror what is observed in human studies, where sperm traits decline with age. The fact that the genetic quality of the sperm of older [males](#) does not appear to compromise early offspring fitness is also important as there is a lot of controversy over male age and fertility and offspring fitness in humans," she says.

Dr. Johnson believes further work is needed to investigate male reproductive success under competitive scenarios as well as longer-term offspring [fitness](#).

More information: Sheri L. Johnson et al. Evidence that fertility trades off with early offspring fitness as males age, *Proceedings of the Royal Society B: Biological Sciences* (2018). [DOI: 10.1098/rspb.2017.2174](#)

Provided by University of Otago

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