

## Offspring benefit from mum sending the right message

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Mediterranean mussel (Mytilus galloprovincialis) shell. Credit: Andrew Butko/Wikipedia



(Phys.org) —Researchers have uncovered a previously unforeseen interaction between the sexes which reveals that offspring survival is affected by chemical signals emitted from the females' eggs.

In the study published today in the *Proceedings of The Royal Society B*, Professor Jon Evans and Honours student Matthew Oliver from the Centre for Evolutionary Biology at The University of Western Australia studied <u>sperm</u>-egg interactions in <u>mussels</u> (*Mytilus galloprovincialis*).

The findings reveal that mussel sperm exhibit consistent but differential 'preferences' for <u>chemical cues</u> secreted from <u>eggs</u> from different females. It also reveals that these preferences predict both the compatibility of sperm and eggs at fertilisation and the chances of the offspring surviving.

"We know that eggs emit chemical cues that attract sperm," Professor Evans said. "We also know from previous studies that sperm are attracted to eggs from the same species. What this research shows is that there are differences in chemical cues from each egg and somehow the sperm is exhibiting preferences in response to those cues that leads to healthier offspring."

The study also found that by experimentally separating the chemical cues (chemoattractants) from eggs, sperm swimming behaviour was influenced by the particular combination of sperm and chemoattractants, and that these patterns of sperm behaviour predicted fertilisation and survival. The researchers concluded that sperm are fine-tuned to respond to chemical cues emitted from genetically compatible eggs, thus maximising fertilisation and larval survival.

"So what we found is that there is a survival advantage for offspring of females who send out the right cues to attract the right sperm," Professor Evans said.



The research team is now working to explore the biochemical and molecular mechanisms underlying these patterns in order to better understand how sperm and eggs interact in the sea.

**More information:** Chemically mediated gamete preferences predict offspring fitness in a broadcast spawning invertebrate, <u>rspb.royalsocietypublishing.or ... .1098/rspb.2014.0148</u>

Provided by University of Western Australia

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