Promiscuous squid fatigued after mating: study

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Southern dumpling squid. Credit: Mark Norman

(Phys.org) -- In order to pass on their genes, southern dumpling squid engage in up to three hours of mating with each partner, but University of Melbourne researchers have found that this results in a reduced ability to swim for up to 30 minutes afterwards.

The research provides new insight into the evolution of reproductive strategies and behaviours and is the first time that the energetic costs of mating have been shown to affect physical abilities after mating.

The research was conducted by Master of Science student Ms Amanda Franklin with Ms Zoe Squires and Dr Devi Stuart-Fox from the Department of Zoology at the University of Melbourne, and is published today in the international journal *Biology Letters*.

The team studied dumpling squid (Euprymna tasmanica) that live in waters of Southern Australia including Port Phillip Bay and Tasmania and reach about 7cm long at adult size.

Dumpling squid engage in up to three hours of mating and males appear to initiate mating whenever the opportunity arises. The male grabs the female from underneath, and holds her in place throughout copulation. Both males and females can change colour from a sandy yellow to dark purple with green and orange highlights. They can also produce a cloud of ink as a decoy to help them escape from predators.

Ms Franklin said the team was keen to understand the impact of such an extensive mating ritual because although traditionally thought to be trivial, the energetic costs of mating could reduce an animal's survival if it decreased the ability to avoid predators and forage for food.

The researchers collected dumpling squid from St Leonards in south-eastern Australia and tested their swimming endurance against a constant current of water in the lab. The squid were then allowed to mate and their swimming ability re-tested.

"We found that after mating, both male and female dumpling squid took up to thirty minutes to recover to their previous swimming ability," Ms Franklin said.

"This suggested that the squid were suffering from temporary muscle fatigue."

"Our results were a little surprising as the degree of fatigue was similar in both genders even though mating looks more strenuous for males."

"We predict that during this phase of muscle fatigue, squid may hide in the sand to avoid predators until they have recovered. The cost to them

in doing this of course is that they cannot forage for food or search for other mates at this time."

Dumpling squid are closely related to about 10 bobtail squid species found around the world, including the waters around Hawaii and the South China Sea. These species have similar mating habits to the southern dumpling squid.

"Dumpling squid live for less than a year, and may engage in the energetic activity of mating many times within their short breeding period. This reproductive strategy may have other costs to individuals besides energy loss and we have investigated this further by assessing the effect of mating on female lifespan. We're hoping to report the results of this experiment very soon."

Provided by University of Melbourne