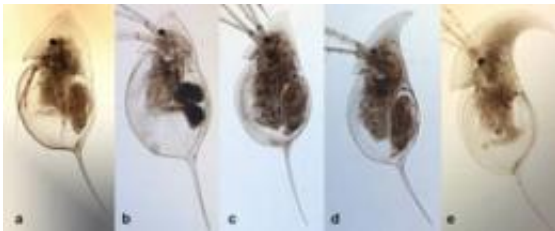


Large caps this spring's must-have for water fleas

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These are photographs of five water fleas, females of *Daphnia cristata*, caught in August in five different lakes in the Örekilsälven river basin in the Munkedal district. In the pictures we can see examples of different sizes and styles of cap. It is particularly interesting that the fetuses in water fleas a and d have the same-shaped caps as their mothers. Credit: University of Gothenburg

It remains one of the unresolved mysteries of the animal world: why do females change the way they look each season while males look the same all year round? Researchers at the University of Gothenburg, Sweden, who have been studying fashion trends for water fleas have found some of the answers.

What can millimetre-long water fleas from twenty small lakes in the Munkedal district of south-west Sweden have to say about animals' winter and summer fashions? A lot, as it happens. The [water flea](#) is, in fact, one of the world's trendiest crustaceans.

New accessories

Water fleas have the ability to change their [appearance](#) to suit their surroundings and the season. This may involve, for example, donning new accessories: water fleas can grow long antennae, a larger back hump or a new "cap" of varying sizes. Researchers at the Department of Zoology at the University of Gothenburg who studied water fleas in the Örekilsälven river basin believe these accessories to be the water fleas' way of reducing the risk of being caught and eaten.

Different trends

What's remarkable is that water fleas in different lakes follow different trends. For example, high up in the Örekilsälven water system, the females have been wearing small round caps teamed with fairly large bodies, while their counterparts further down in the system have gone the other way - larger caps but smaller bodies.

Fashion for protection

Hans Lord, researcher at the Department of Zoology, offers an explanation in his thesis. A large cap protects the water fleas from small invertebrate predators, as it makes it harder for these predators to catch and hang on to them. Smaller bodies, in turn, are the water fleas' way of adapting to predatory fish, which rely on their sight to locate their prey. The combination of a small body and a large cap is a compromise: the smaller body reduces the risk of being spotted by a fish, while the large cap (which is transparent and therefore invisible to the fish) offers protection from invertebrate predators.

Males not trendy

The males, on the other hand, don't seem at all bothered by current trends.

This may be to do with reproduction: given that the females carry the offspring, a dead female is a greater loss than a dead male. It is therefore more worthwhile for the females to invest in a look that will protect them against predators. Another explanation is that the males are driven by their need to find [females](#) to mate with as quickly as possible - and that swimming up to a female whilst wearing a large cap and long antennae requires too much energy, takes too long and entails a risk that other males will get there first.

Extravagant for summer

This also explains why the fashions are more extravagant in the summer than the winter. "When the water's cold, it's more difficult to move through, which makes it extra-hard to swim with accessories," says Lord, researcher at the Department of Zoology and expert in fashion trends for water fleas. "This is one of the explanations for why we find water fleas with extreme looks during the summer only, when the water is warm, but not during the rest of the year. Another explanation is that the summer brings more invertebrate predators."

Provided by University of Gothenburg

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