



What makes a rockfish sexy?

by Stefan Linqvist

Visitors to the Ucluelet Mini-Aquarium are often interested in the extremes. What's the most poisonous jellyfish on our coast? How big is the largest sea star? Which species is the rarest, the longest living, the most dangerous. These questions are sometimes tricky to answer. But when it comes to identifying the sexiest species on our coast there's no contest – I point people in the direction of our rockfish exhibit.

Unlike most fishes, rockfish have internal fertilization and give birth to live young. Some species become sexually mature as late as 20 years old, but reproduce until they are 120. Females become increasingly more fertile as they age, producing more eggs and healthier offspring each season. But before anything can happen a male rockfish must catch the eye of a female and this, it turns out, is no simple matter. Rockfish have elaborate courtship rituals. The male performs a special "wiggle-dance" in front of a female's snout, urinating as he does so (to release pheromones), while emitting a well-timed series of clicks. Only if she likes his dance, his smell, and the way he sounds will a female agree to mate.

These fanciful displays might explain one of the great mysteries surrounding rockfish evolution: why are there so many species? A whopping 60 species of rockfish are found in the North East Pacific. This is much more diversity than one finds in any other local genus of fishes. You've got to wonder why this one lineage has branched so many times.

The received view states that speciation requires geographic isolation. Suppose sea levels were to lower – as occurs during an ice age – and some channels on Vancouver Island were cut off from the open ocean. The fishes living in those marine lakes would become reproductively isolated from the population at large. Over time mutations would occur, isolated populations would diverge genetically, and when sea levels rise again two species (or more) would exist where previously there was one.

That's how it's supposed to happen. However, some biologists think that new species can arise within a single, geographically continuous population as a result of mating preferences. Every so often a rockfish is born who shimmies when he's supposed to shake, who clicks three times instead of twice, or whose urine smells a bit odd. He probably won't seem attractive to most females. But as they say, there's someone for everyone. Once in a while there will be an equally exceptional female who finds those unusual traits simply irresistible. By passing those differences on to their offspring this couple could become the progenitors of a new species. On this (admittedly controversial) theory, mating preferences act as a sort of virtual reproductive barrier. The fact that rockfish displays are especially elaborate compared to those of other fish species explains why this group is so diverse - the more complex something is the more ways there are to modify it.

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