

Tiny Fish Picks Up 300 Times Its Body Weight

The northern clingfish is native to the Pacific Coast of North America. This remarkable saltwater fish lives in rocky intertidal areas where waves and currents are strong, and these rough waters can toss fish out to sea, away from their nesting spot. The northern clingfish has evolved a remarkable adaptation to solve this problem: it has a sticky spot on its belly called an adhesion disc. Using this disc, the northern clingfish can pick up and hold things that are up to 300 times its own body weight.



This disc works similarly to a man-made suction cup, but it's a lot stronger. The northern clingfish's adhesion disc is made out of its own pelvic and pectoral fins, according to biologist and researcher Adam Summers, from the University of Washington.

"Basically, if they get stuck on a surface, you are going to have to literally yank on them to get them off," said Adam. "And if you throw them in a bucket with water and then dump it out, you'll have an empty bucket with nothing but the clingfish inside."

The adhesion discs are so powerful that scientists are studying the northern clingfish so they can build stronger suction cups. The scientists are looking closely at how the adhesion discs stick to rocks and other surfaces.

The northern clingfish's fins form a disc. Around the edge of the disc, there are tiny hexagons that look flat.

"But when you look at them under a scanning electron microscope," Summers said, "you can see the top of each of those hexagons looks like a field of spaghetti - long, thin hairs that are the same aspect ratio and length as the hairs on spiders' toes or beetles' feet."

This microscopic "field of spaghetti" is what enables the adhesion disc to keep such a strong hold, according to Summers. These tiny hairs latch on to the surface and keep the adhesion disc from moving.

The adhesion disc also acts like a man-made suction cup. After the hairs take hold, the clingfish also maintains low pressure inside the suction zone.

The northern clingfish's powers of adhesion are not only used for holding on to rocks. These powers are also used to hunt for limpets, which are round and attach themselves to rocks.

"When they see one, they get really close without touching it and then they suck down to give themselves a nice solid launch point," Summers said. "And then they open their mouth and thrust forward while remaining sucked down and jam their lower jaw teeth under the limpet and suck it off the rock."

There are around 160 species of clingfish known to man. Like us, they come in many different shapes and sizes.