Field study shows how sailfish use their bill to catch fish

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Two men holding a freshly caught sailfish. Credit: Wikipedia

(Phys.org) —A large team of European researchers has finally revealed the purpose of the long, thin, needle-like bill sported by the famous sailfish. It's used, they report in their paper published in *Proceedings of the Royal Society B: Biological Sciences*, to sneak into fish schools to capture prey unaware, and then to stun and slash to capture food.

Sailfish are famous, generally as mounted specimens hung on bar room walls. Their large dorsal fin and long pointy bill make them instantly recognizable. But until now, despite such fame, the actual purpose of the bill had not been determined. Some scientists have suggested it helps in navigating, which would make sense as the sailfish is one of the fastest swimmers in the ocean. Others contend the bill somehow helps the fish catch prey—they are carnivorous, after all. The researchers with this latest effort appear to have finally settled the matter once and for all.

Suspecting the bill's main purpose is to help catch prey, the researchers mounted an expedition to Cancun, Mexico and picked up on a tip from local guides—they discovered they could find sailfish feeding by looking for places where seabirds congregated. When hunting, sailfish push some of their prey to the surface making easy pickings for the birds. The prey in this case was sardines, which band together in ball shaped schools.

The team spent nearly a week out on the water using high speed cameras to capture the action for study later. That led to the revelation—groups of sailfish surrounded a school, then each took turns pushing their pointy bills right into the mass of fish, a move which didn't seem to be noticed by the sardines at all. Then, suddenly the sailfish swung their bill back and forth, very sharply—strong enough to catch the sardines off guard. Some of the sardines were stunned by the blows, others were cut. That allowed the sailfish to grab their prey and gulp them down.

The video also showed that the sailfish sometimes used another technique to catch a sardine—after inserting their bill they would single out an individual target by tapping it enough to cause it to be extracted from the school—that made it easy to grab and swallow.

More information: How sailfish use their bills to capture schooling prey, Published 23 April 2014 DOI: 10.1098/rspb.2014.0444

Abstract

The istiophorid family of billfishes is characterized by an extended rostrum or 'bill'. While various functions (e.g. foraging and hydrodynamic benefits) have been proposed for this structure, until now no study has directly investigated the mechanisms by which billfishes use their rostrum to feed on prey. Here, we present the first unequivocal evidence of how the bill is used by Atlantic sailfish (Istiophorus albicans) to attack schooling sardines in the open ocean. Using high-speed video-analysis, we show that (i) sailfish manage to insert their bill into sardine schools without eliciting an evasive response and (ii) subsequently use their bill to either tap on individual prey targets or to slash through the school with powerful lateral motions characterized by one of the highest accelerations ever recorded in an aquatic vertebrate. Our results demonstrate that the combination of stealth and rapid motion make the sailfish bill an extremely effective feeding adaptation for capturing schooling prey.