

Reef sites

The use of tools by wrasses (Labridae)



Fig. 1 Series of three photographs (see movie in Electronic Supplementary Materials) of an orange-dotted tuskfish, *Choerodon anchorago*. The fish fans sand to unearth the bivalve (a), takes it into its mouth, swims approximately 5 m to a rock (b), and crushes the mollusk against it (c)

Recently, Jones et al. (2011) described the use of a rock as an anvil to crush a bivalve by a wrasse, the blackspot tuskfish, *Choerodon schoenleinii*. They concluded by underscoring the importance of comparative studies on tool use in fishes. Two similar occasions of tool use were previously described for other wrasses (Labridae). In Florida, Coyer (1995) observed a yellowhead wrasse, *Halichoeres garnoti*. Pasko (2010) observed a sixbar wrasse, *Thalassoma hardwicke*, in an aquarium setting. Here, we describe a fourth instance by yet another wrasse, the orange-dotted tuskfish, *Choerodon anchorago* (Fig. 1).

On July 12, 2009, at 10:30 h in Palau, in 4 feet of water, an individual *C. anchorago* was observed cracking bivalves using a rock as an anvil. After two such events, we started filming the behavior, which was repeated a third time (see Electronic Supplementary Material). Each event lasted less than 5 min, for a total observation time of approximately 20 min. The fish first dug out the bivalve by fanning sand with its pectoral fin and then took the mollusk to a rock, or coral head, where it was crushed in a similar way to what has been described for *C. schoenleinii*.

The use of rock as an anvil has now been described from different places in three genera of wrasses, the ancestral *Choerodon*, and the more derived *Halichoeres* and *Thalassoma*, which span the majority of the evolutionary history of wrasses (50 million years, Cowman et al. 2009). All observations were similar in both the use of a rock as an anvil to open or reduce the size of a bivalve to making it edible and the sideways movement of the head associated with it. The similarity of the behaviors suggests that either they emerged independently or they correspond to a deep-seated behavioral trait. If this were the case, we predict that other wrasses are likely to also use these forms of tools. The presence or absence of such a behavior in other groups of fishes will determine whether the use of a rock as an anvil is unique to wrasses or whether it can be generalized to other groups of fishes.

References

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