What appears to be a defensive behavior in the anchovy could also be a double-edged sword

Fig. 1 Predation of *Stolephorus commersonnii* by *Euthynnus affinis* (a) and adult specimens of *Carcharhinus leucas* (b). (Photograph: Yannick Stephan)

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The anadromous anchovy species *Stolephorus commersonnii* is a schooling fish found in Indo-Pacific areas, with a preference for brackish waters. It features in the diet of many predators, including juvenile reef-associated sharks (Heupel and Hueter 2002). However, this small species (max. length: 10 cm) is not supposed to be foraged by the bull shark *Carcharhinus leucas*, whose adult specimens do not feed on such small prey (Werry et al. 2012). Here, we report upon adult bull sharks preying, at sunset, on an anchovy school on March 29, 2012, near the pass ‘‘Mtsamboro’’ north of Mayotte (southwestern Indian Ocean). This unusual foraging pattern may be triggered by the defensive behavior in the anchovy toward black skipjack *Euthynnus affinis*.

In response to skipjack predation, the anchovy gathered into a compact school formation (Fig. 1a). Within this school, individual anchovies were virtually indistinguishable and the skipjack seemed incapable of targeting an individual fish. However, when this compact school took on the appearance of a single prey, it triggered the attack of the bull sharks (Fig. 1b), which were uninterested in isolated anchovies.

Successive attacks by predators continued until the anchovy school disappeared; the shark attacks initially broke up the cohesion of the school, permitting the skipjack to hunt isolated anchovies, which immediately reorganized themselves into one or more smaller schools. This regrouping had the effect of triggering further shark attacks.

This report shows that in ecosystems with complex biomass structure such as a coral reef, the hunting patterns of different species may be mutually beneficial. It is common to refer to the interactions among species of high trophic-chain levels as intraguild predation (Arim and Marquet 2004); however the win–win outcome interaction between predators reported here is, as yet, rarely discussed.

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