

Scientific Note

Predation Tactics of Trumpetfish in Midwater

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Predators are known to modify hunting tactics in response to local conditions to exploit prey of different species, densities or position within habitat patches. I describe three unusual prey hunting tactics used by trumpetfish (*Aulostomus maculatus*) distributed in midwater above reefs off Bonaire, Netherlands Antilles, in the southern Caribbean Sea. Hunting behaviors were focused on dense feeding aggregations of brown chromis (*Chromis multilineata*) and were categorized as: (1) slow horizontal following, (2) vertical hovering or drift, and (3) diagonal cross encounters where trumpetfish descended diagonally through the water while adjusting trajectory to encounter target prey. Understanding variation in predator behavior and ambit, in this case vertical ambit, adds to our knowledge of how predators adapt to unique local opportunities to exploit prey.

Predadores são conhecidos por modificar táticas de caça em resposta às condições locais para explorar presas de diferentes espécies, densidades ou posição dentro dos habitats. Descrevo três táticas de predação não usuais utilizadas pelo peixe-trombeta (*Aulostomus maculatus*) à meia água sobre os recifes de Bonaire, Antilhas Holandesas, na porção sul do mar do Caribe. Comportamentos de caça foram direcionados para densas agregações de forrageamento de mulatas (*Chromis multilineata*) e foram categorizados como: (1) perseguição horizontal lenta, (2) pairando verticalmente ou à deriva, e (3) encontros cruzados diagonais, onde o peixe-trombeta desce diagonalmente através da água enquanto ajusta a sua trajetória para interceptar a presa almejada. A compreensão do comportamento do predador e seus domínios, neste caso a dimensão vertical, contribui para o conhecimento de como predadores se adaptam a condições locais particulares de exploração de presas.

Key words: Behavior, Habitat, Prey, Distribution, Caribbean Sea.

Predators at multiple trophic levels are known to move temporarily to different habitats and change behaviors to take advantage of ephemeral or unique prey resources (e.g., Sancho, 2000; Sazima & Sazima, 2004; Auster, 2005). Prey resources can be unique based on species composition, density or location within a habitat; capitalizing on such resources can be advantageous when the benefits of, or the perceived potential for, prey acquisition exceed the risk of predation (Walters & Juanes, 1993).

Trumpetfish (*Aulostomus maculatus*, Aulostomidae) are demersal piscivores occurring on coral reefs and back-reef habitats in the western Atlantic. Previous behavioral studies, although limited, have described a range of stalk and ambush strategies that occurred within approximately 1 m of the seafloor (Helfman 1989). Trumpetfish are known to ambush prey

while hiding amongst the branches of soft corals, “ride” large herbivores and invertivores (e.g., parrotfishes in the family Scaridae and Spanish hogfish *Bodianus rufus*), as well as travel amongst single species aggregations of fishes (e.g., blue tang *Acanthurus coeruleus*), all in order to use various forms of camouflage to ambush prey at short strike distances (Kaufman, 1976; Aronson, 1983).

Here I report observations of trumpetfish stalking and attacking brown chromis (*Chromis multilineata*, Pomacentridae) high in the water column, an unusual behavior pattern in a predator that usually swims near the bottom or is associated with structure. Direct observations were made over the reef slope and crest on Bari Reef off Bonaire (12° 10.04' N, 68° 17.29' W) from 18-23 June 2007. Bonaire is located approximately 100 km off the coast of Venezuela in the Netherlands

Antilles. The main island is 56 km in length and 11 km wide and is surrounded by narrow fringing reefs (Van Veghel, 1997). Observations were made during five daytime scuba dives (total dive time ca. 233 minutes).

In areas where stalking and predatory attacks were observed, brown chromis occurred in dense and spatially extensive feeding aggregations in the water column (i.e., 10s of meters linear distance along reef, 10-20 m width from shallow to deep water; up to 10-12 m above the seafloor; 10-25 cm nearest neighbor distance). Fifteen to 40 trumpetfish per dive were observed at this site with 30 to 82% of trumpetfish stalking brown chromis at heights from 2 to over 10 m above the seafloor. Eighteen trumpetfish were observed on one additional dive at this site (61 min bottom time) but none were in the water column and brown chromis were patchily distributed but not in large feeding aggregations above the seafloor. All but one of 19 trumpetfish observed at two other sites off Bonaire (117 min bottom time) were also distributed within approximately 1 m of the seafloor and brown chromis were also patchily distributed. The single individual observed about 6 m from the reef face was stalking brown chromis in a large and dense aggregation.

Three distinct hunting (i.e., stalking) tactics were observed: (1) slow horizontal following, (2) vertical hovering or

drift, and (3) diagonal cross encounters where trumpetfish descended diagonally through the water column while adjusting trajectory to encounter target prey. Individual fish used multiple tactics. Horizontal following of prey occurred primarily within and along the lower boundaries of dense feeding aggregations. Trumpetfish exhibited vertical hovering when initially positioned along the upper boundary of brown chromis aggregations (Fig. 1). Feeding aggregations of either Creole wrasse *Clepticus parrae* or sergeant major *Abudefduf saxatilis* were often distributed above brown chromis and produced silhouettes that potentially served as camouflage for trumpetfish (individuals of both species were larger than brown chromis, apparently making them too large for trumpetfish to consume). Diagonal cross encounter movements began when trumpetfish were at multiple positions within feeding aggregations (Fig. 2). Quantification of stalk, attack and capture rates were not addressed in a systematic manner throughout the period of observations reported here but rates of attacks and successful captures were extremely low. A total of 63 occurrences of stalking were observed with only 17 attacks and 5 captures. Attacks resulted from each type of hunting tactic and at least one attack based on use of each tactic culminated in the successful capture and consumption of a brown chromis. There was no clear set of con-

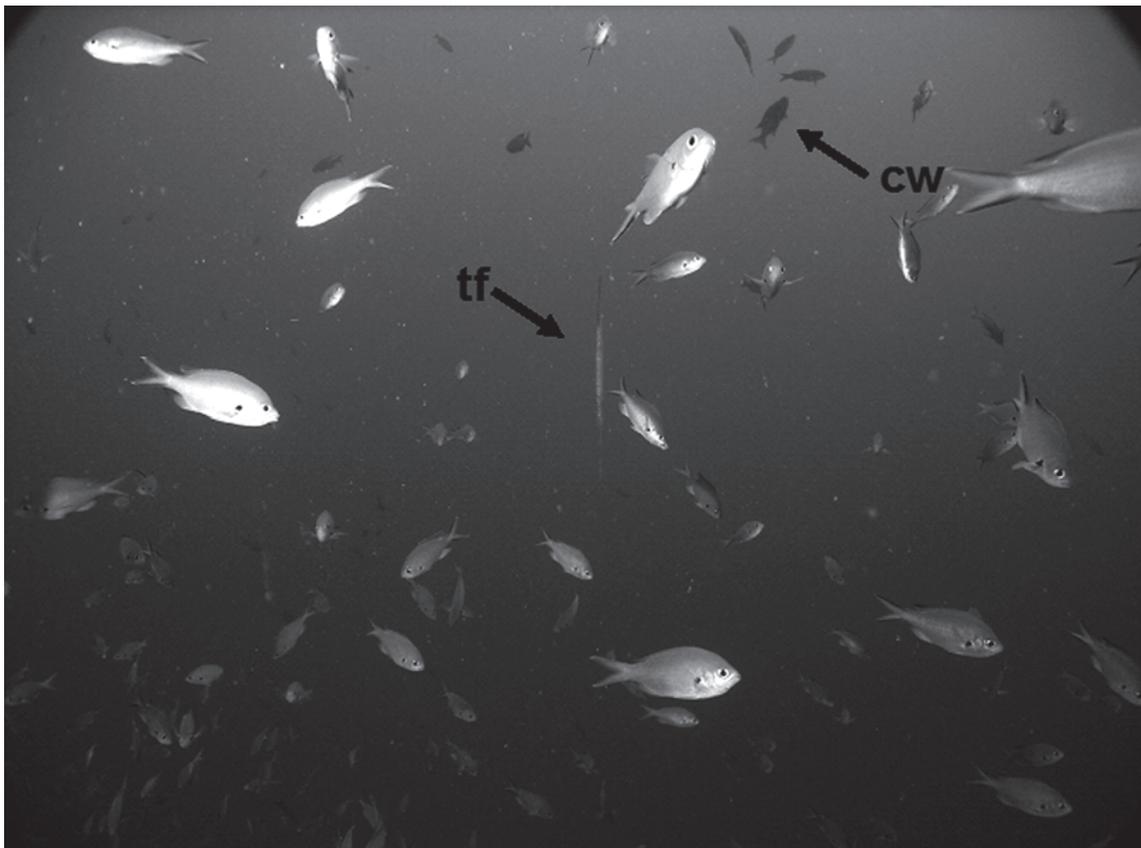


Fig. 1. A trumpetfish (“tf” at center arrow) hovering vertically above a feeding aggregation of brown chromis in order to stalk and ambush prey. Note the aggregation of Creole wrasse (cw) above.



Fig. 2. A trumpetfish transiting diagonally through a feeding aggregation of brown chromis. Trumpetfish made small corrections in trajectory to encounter potential prey.

ditions when one type of hunting tactic in the water column was used in contrast to the others. For example, during one dive 14 of 26 trumpetfish were observed in the water column at first encounter. Two stalked prey using slow horizontal following, four were using vertical hovering and drift, and eight were using diagonal crossing through the aggregation of brown chromis. The size range of fish (total length estimated visually) was 15-70 cm with the largest fish highest in the water column. On a subsequent dive, 7 of 15 trumpetfish were in the water column and all were stalking prey using slow horizontal following.

Previous descriptions of the composition and patterns of species interactions of reef fishes off Bonaire indicated a high degree of similarity in species composition of fishes along the leeward shore of the main island (Pattengill-Semmens 2002, Auster *et al.*, 2005). Both trumpetfish and brown chromis occurred primarily in the same depth range. Given this overlapping distribution pattern, there are opportunities for predators to adapt foraging tactics to local variation in small-scale distribution and abundance. In the present study, it appears that trumpetfish modified their normal demersal and structure associated tactics to take advantage of large prey aggregations high in the water column. Understanding variation in predator behavior and ambit, in this case vertical ambit, adds

to our knowledge of how predators adapt to unique local opportunities to exploit prey.

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