

Scientific Note

Does the association of young fishes with jellyfishes protect from predation? A report on a failure case due to damage to the jellyfish

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The fish-jellyfish association is regarded as a temporary symbiosis believed to protect the fishes from predators. Here we report on juvenile scads (*Trachurus lathami*) associated with the jellyfish *Chrysaora lactea*, opportunistically preyed on by the grouper *Mycteroperca acutirostris* while the medusa was being damaged. The predation instances occurred when a couple of the filefish *Stephanolepis hispidus* approached the jellyfish to nibble on its umbrella. The feeding of the filefish caused a momentary disturbance of the defensive association, perceived and capitalised on by the watchful grouper, an opportunistic and versatile hunter. Before and after the disturbance, the protection offered to the young fish by the jellyfish showed to be effective, which strengthens the hypothesis of defensive function of this association.

A associação entre peixes e medusas é considerada uma simbiose temporária que protegeria os peixes contra predadores. Relatamos aqui a predação oportunista de juvenis de xixarro *Trachurus lathami*, associados à medusa *Chrysaora lactea*, pelo badejo-mira *Mycteroperca acutirostris* enquanto a medusa estava sendo danificada. Os eventos de predação ocorreram quando um casal do peixe-porco *Stephanolepis hispidus* se aproximou da medusa para alimentar-se de pequenas porções da sua umbrela. A alimentação dos peixes-porcos causou um distúrbio momentâneo na associação defensiva, percebido e aproveitado pelo atento badejo-mira, um predador versátil e oportunista. Antes e depois do distúrbio, a proteção conferida aos peixes juvenis pela medusa mostrou ser efetiva, fortalecendo a hipótese de função defensiva desta associação.

Key words: protective symbiosis, fish-jellyfish association, predation, defence, SW Atlantic.

Introduction

The association of juvenile fishes with jellyfishes is a temporary symbiosis believed to protect the fishes from predators (Mansueti, 1963; Rees, 1966). Young fishes associated with jellyfish tend to stay over the umbrella of the medusa and come down in direction of the tentacles only while frightened or while feeding on the medusa itself (Rees, 1966; JPK & RMB pers. obs., 2001). The survival of juveniles of some species of pelagic fishes is considered as dependent on jellyfish, since young individuals of these species associated with jellyfishes are very rarely recorded in the diet of pelagic-feeding fishes (Nagabhushanam, 1964).

Here we report on juvenile rough scads (*Trachurus lathami*: Carangidae) associated with the jellyfish *Chrysaora*

lactea (Pelagiidae) and opportunistically preyed on by the comb grouper (*Mycteroperca acutirostris*: Serranidae) while the jellyfish was being damaged by foraging planehead filefishes (*Stephanolepis hispidus*: Monacanthidae). Our record strengthens the hypothesis that the association with jellyfishes does protect young pelagic fishes from some predator types.

Material and Methods

Our observations were conducted on the rocky reefs of the Marine Biological Reserve of Arvoredo (about 27°17'S, 48°18'W), off the coast of Santa Catarina, southern Brazil, in December 2001. The depth ranged 2-9 m and horizontal visibility was 8 m. Juvenile *Trachurus lathami* associated with

Chrysaora lactea were observed within a 60 min session while scuba-diving. The fish and jellyfish were photographed and the foraging behaviour of *Mycteroperca acutirostris* on *T. lathami* and of *Stephanolepis hispidus* on the jellyfish was video-recorded. The description presented herein is based mostly on the video-record. A copy of the record is deposited as voucher in the Museu de História Natural da Universidade Estadual de Campinas (ZUEC tape #17).

Results

We found an individual of the jellyfish *Chrysaora lactea* (about 20 cm diameter) swimming and drifting near a rocky shore with a group of about five juvenile rough scads (*Trachurus lathami*) hovering above and close to the jellyfish's umbrella. Some tentacles of the jellyfish were broken and portions of the manubrium, as well as small portions of the umbrella were missing. A comb grouper (*Mycteroperca acutirostris*) tried several times to approach the scads from below the tentacles (Fig. 1), with some of the young fish sheltering beneath the subumbrella (Fig. 2) presumably protected by the tentacles, while the other stayed atop the umbrella presumably using the jellyfish as a shield against the predator.

Two instances of predation by the grouper on the scads were recorded when a couple of filefish (*Stephanolepis hispidus*) approached the jellyfish to nibble on its umbrella. When the filefish began to nibble on the jellyfish, the scads fled from their refuges and swam down the jellyfish, momentarily out of the protection given by the umbrella or the close proximity while among the tentacles. While doing so, one scad was immediately preyed on by the watchful grouper which was hovering at mid-water close and below the jellyfish (Fig. 3). The grouper's attack caused the filefish to withdraw for a while and the scads regrouped above the jellyfish's umbrella. When the filefish resumed their nibbling



Fig. 2. Juvenile carangids and other fishes tend to stay close to a jellyfish's umbrella or among its tentacles while frightened.

on the jellyfish, the grouper charged again and another scad was preyed on. After nibbling for a while the filefish withdrew and the remaining scads regrouped above and close to the umbrella again.

We recorded another comb grouper individual watching closely a group of about 15 rough scads associated with *C. lactea*. The grouper followed the swimming jellyfish and approached the association from below (as shown in Fig. 1), presumably trying to cause the jacks to move. When the grouper approached the jellyfish the young fish divided in two groups. About one half of them retreated to the top of the umbrella and the remainder stayed among the jellyfish's tentacles, thus becoming inaccessible to the predator. After several unsuccessful attempts the grouper withdrew to the bottom.

Discussion

Instead of the classical image of the young fishes sheltering beneath the subumbrella and being protected by



Fig. 1. A watchful comb grouper (*Mycteroperca acutirostris*) while following the jellyfish (*Chrysaora lactea*) tries to approach a small group of juvenile scads (*Trachurus lathami*), and induce them to leave the shelter on the top and among the tentacles of the jellyfish.



Fig. 3. A couple of planehead filefish (*Stephanolepis hispidus*) nibbling on the jellyfish umbrella caused the rough scads to leave momentarily their shelter, one of them being immediately preyed on by the comb grouper (seen here charging beneath the jellyfish, at left).

the tentacles of the jellyfish (Rees, 1966), some of the juvenile *T. lathami* recorded herein used the jellyfish as a shield and stayed on the top of the umbrella while the grouper was trying to approach the fish from below the tentacles. The relative small size of the jellyfish may explain this situation, since all fish would not suit themselves beneath the subumbrella. The grouper probably overlooked the fish grouped atop the umbrella, since it was looking for the scads beneath the subumbrella. We presume that the scads atop the umbrella would be vulnerable to an attack of the grouper were they spotted there. However, as soon as the scads deserted from their refuge, likely disturbed by the filefish nibbling on the umbrella, they became vulnerable and were immediately preyed on by the watchful grouper. The feeding behaviour of the filefish clearly disrupted the protective association, a change perceived and capitalised on by the grouper, an opportunistic and versatile hunter (Sazima, 1986). The several unsuccessful predation attempts by the comb grouper on the sheltered scads strengthen the protective hypothesis of the fish-jellyfish association (Mansueti, 1963; Rees, 1966).

Although records on predation of fishes associated to jellyfish are rare, a young whiting (*Merlangius merlangus*: Gadidae) was observed being chased from under a jellyfish (*Cyanea* sp.) by a couple of pollacks (*Pollachius pollachius*: Gadidae) and preyed on when it left its live shelter (Couch 1864 apud Nagabhushanam, 1964). There are no further details, but we suspect that this situation is similar to the predation record presented herein, since in both instances the young fishes left their jellyfish shelter, and thus the presumed protective association was no longer effective.

We suggest that failure cases of the protective function of the fish-jellyfish association are mostly due to particular circumstances such as those described here, *i.e.*, damage to the jellyfish and the small fishes leaving momentarily their shelter. Additionally, failure of this association may be favoured when the predators of young fishes forage in couples

or small groups, since the disturbance caused by two or more predators likely are more effective to induce the young fish leaving their shelter.

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