

On the occurrence of the digenean *Otodistomum veliporum* in the spiracle of the kitefin shark *Dalatias licha*

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*The presence of the digenean *Otodistomum veliporum* is reported here for the first time as a parasite in the spiracle of a Mediterranean specimen of the kitefin shark *Dalatias licha*.*

Key words: *Otodistomum veliporum*, *Dalatias licha*, spiracle, Calabria, Mediterranean

INTRODUCTION

Otodistomum veliporum (Creplin, 1837) is a digenean trematode belonging to Family Azygidae. It is a parasite present in body cavity, spiral valve and stomach of elasmobranchs and holoccephalans. The colour of this helminth varies from opaque white to yellow and the maximum length is 80 mm. All members of *Otodistomum* genus were revised and redescribed by GIBSON & BRAY (1977). This genus has been recorded from sub-tropical, temperate, sub-Artic and sub-Antartic regions (THRELFALL & CARVAJAL, 1986; ZDZITOWIECKI & PISANO, 1996). GIBSON & BRAY (1977) reported the species *Otodistomum veliporum* for the Atlantic and the Mediterranean, in particular as host in bony fish and elasmobranchs from waters off Sicily. However, little is known about this species, particularly the life cycle. Here we report for the first time the presence of this parasite in the spiracle of the kitefin shark *Dalatias licha* (Bonnaterre, 1788), which is a moderate sized deep-water shark unevenly distributed on continental and insular shelves and slopes in warm-temperate and tropical areas

at depths of 37 to 1,800 m in the North and Central Atlantic, western Indian Ocean and Western and Central Pacific Ocean.

MATERIAL AND METHODS

During November 2011, a female of *Dalatias licha* 1100 cm of total length was caught in deepwater longline off the beach of Cetraro (38° 30' N; 15° 56' E) in the Southern Tyrrhenian Sea (Central Mediterranean Sea). Analysis of the stomach contents and internal organs has been performed. For parasitological analysis, gastrointestinal tract, as well as gills, liver, heart, and kidneys, were dissected and placed separately in Petri dishes containing 0.9% saline solution (COMAS *et al.*, 2014; DE DONATO *et al.*, 2017). Ectoparasites have been searched along the whole body, including mouth and spiracle. Organs were examined separately for helminth detections under a stereomicroscope. The presence of just one Digenean elminth into the spiracle of the shark was observed. Recovered helminth was placed in vials in 70% ethanol. According to GIBSON (1996) taxonomic keys

used for the identification of the digenean were: ventral sucker larger than oral sucker; breadth ratio between suckers in the range 1:1,5-2,1; vitellarium present into anterior 2/3 of the body.

RESULTS

Only a single beak of the cephalopod *Totarodes sagittatus* Lamarck, 1798, which is very common in the area, and the shell of an unidentified shrimp were found in the stomach of the shark. No parasites have been found in the internal organs. Instead, the external parasitological survey confirmed the presence of one specimen of *Otodistomum veliporum* actively attached to the mucosa of the spiracle of the shark (Fig. 1). This parasite was easily distinguishable for the presence of two suckers close to the anterior extremity of the elminth: the ventral one (4,5 mm) was larger than the oral one (2,2 mm) with a breadth ratio of 1:2,04. The specimen collected was 54 mm body length with non-spinous cuticle and yellow body color. The digestive tract was characterized by the absence of the prepharynx, by a conspicuous pharynx and by a long and sinuous caecum, mainly extending in the posterior extremity of the elminth. The genital pore was located near the left portion of the pharynx. Vitellaria were well developed, extending from the ventral sucker to the two-thirds of the body: they were absent into the third posterior part. Two continuous ovoid testes were observed near the mid-body: ovary was located in close proximity of the anterior testis.



Fig. 1. Specimen of *Otodistomum veliporum* removed from the spiracle of *Dalatias licha* (bar = 10 mm)

DISCUSSION

In the Mediterranean, the range of *Dalatias licha* appears to be confined to the western and central basins (BAINO *et al.*, 2001). This shark is found sporadically in the South Tyrrhenian (SPERONE *et al.*, 2012; ZENETOS *et al.*, 2015; KARACHLE *et al.*, 2016) and very few information is available regarding its biology and ecology. The low reproductive rate of this species renders it susceptible to overfishing and, coupled with known population declines, has led it to be assessed as Near Threatened by the IUCN: for this reason, every information regarding distribution, biology and ecology of the species could be important.

The digenean *Otodistomum veliporum* is here reported for the first time as parasite of *Dalatias licha* in the Mediterranean Sea. This species has been reported in many elasmobranchs species (*Squalus acanthias*, *Bathyrāja richardsoni*, *Centroscyllium fabricii*, *Raja jenseni*, *Raja laevis*, *Raja ocellata*, *Raja radiata*) from the Atlantic and the Mediterranean (GIBSON & BRAY, 1977; GIBSON, 1996), and DAWES (1968) reported the presence of this elminth in the Pacific (*Pristiophorus* sp. from Australia and New Zealand). The parasite has been found in stomach, rarely oesophagus, branchial cavity and intestine. Many of the hosts examined in other papers (BRICKLE *et al.*, 2002) showed small scars that were produced by the ventral and oral suckers of the parasite on the surface of the organs within the abdominal cavity and were most conspicuous on the liver. However, *Dalatias licha* examined in the present paper did not show evident scars in the abdominal organs. Scarce information is available regarding the prevalence and mean intensity of *Otodistomum veliporum*. SCOTT (1982) reported few numbers (1-8) of this parasite in the host. This is a common pattern for other *Otodistomum* species, with few exceptions like *Otodistomum plunketi* that showed a maximum number of specimens of 136 in *Bathyrāja multispinis* (BRICKLE *et al.*, 2002).

Therefore, based on previously stated, in this paper *Otodistomum veliporum* is reported for the first time as a parasite of the spiracle of a shark. Spiracles are breathing openings found

in some sharks and all rays. They are a pair of openings just behind the fish's eyes that allow it to draw oxygenated water in from above, without having to bring it in through the gills. The spiracles open into the mouth and the water is passed over the gills for gas exchange and out of the body.

As *Otodistomum veliporum* is a parasite typical of the digestive tract, its presence in the

spiracle could be interpreted as a shift occurred after the shark's death. It is reasonable to assume that it has climbed the digestive tract up to the mouth, from where it then entered the spiracle. However, we cannot entirely exclude that the spiracle could really be a site of infestation for the parasite, since it was found actively attached to the mucosa.

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Pojava parazita *Otodistomum veliporum* u štrcalu morskog psa drkovne (*Dalatias licha*)

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SAŽETAK

Prvi put je zabilježena u znanstvenoj literaturi prisutnost parazita *Otodistomum veliporum* u štrcalu morskog psa drkovne *Dalatias licha*.

Ključne riječi: *Otodistomum veliporum*, *Dalatias licha*, štrcalo, Kalabrija, Sredozemlje