BASTERIA, 71: 97-100, 2007

Ommastrephes bartramii (Cephalopoda, Teuthida, Ommastrephidae) in the Gulf of Taranto, eastern Mediterranean Sea

Giambattista BELLO

Arion, C.P. 61, I 70042 Mola di Bari, Italy; giabello@libero.it

Four juveniles of *Ommastrephes bartramii* and two of *Todarodes sagittatus* were attracted to the sea surface by an electric light and dip-netted (water depth: ca. 900 m) in the Gulf of Taranto (North Ionian Sea) during a night-time swordfish fishing cruise. This seemingly shows that *O. bartramii* is not rare, but it is just rarely caught by man as well as by teuthophagous predators.

Key words: Cephalopoda, Ommastrephidae, *Ommastrephes*, distribution, population, Ionian Sea, western Mediterranean.

INTRODUCTION

Ommastrephes bartramii (Lesueur, 1821) is an oceanic squid distributed bi-subequatorially in all the world oceans, including the Mediterranean Sea (Nesis, 1987). It is the only representative of its genus; however, three not yet formally described subspecies are reported from the North Atlantic, the North Pacific, and southern parts of all the oceans, respectively (Nesis, 1987). According to Naef (1923) *O. bartramii* has a slender body with very powerfully developed muscles of mantle and fins, making it the strongest swimmer of all known cephalopods. It inhabits a wide vertical water range, from the surface to about 1500 m deep and shows diel vertical migrations rising towards the surface at night (Guerra, 1992). This squid is commercially exploited, especially in the Pacific, where it has been the subject of much scientific research (e.g. Okutani, 1977; Inada et al., 1996).

As for the Mediterranean population, no taxonomic, life history, or ecological studies were dedicated to it following the monograph on the cephalopods of the Bay of Naples by Naef (1923) (cf. Belcari, 1999). Indeed *O. bartramii* is still a somewhat mysterious cephalopod, despite its conspicuous body, that attracts much human attention (the second largest Mediterranean cephalopod next to *Thysanoteuthis rhombus* Troschel, 1857), it is very rarely caught by fishing gear and it has only been found occasionally in the stomach contents of teuthophagous predators (e.g. Bello, 1997). This explains why single large specimens of this purportedly rare squid have been reported sporadically (sometimes as *O. caroli* (Furtado, 1887)), (c.f. Belcari, 1999, for a list of occurrence in the Italian seas), either in scientific notes, in popular fishing magazines, and even in ad hoc conferences. Thanks to such reports the known range of *O. bartramii*, which until the early 1960s was restricted to the Western Mediterranean (Mangold-Wirz, 1963), presently includes the whole Mediterranean basin (Bello, 2003). Mediterranean records of young individuals of *O. bartramii* are even scantier than those of large specimens (e.g. Naef, 1923; Torchio, 1967; Orsi Relini, 1990; Orsi Relini et al., 1994). In conclusion, *O. bartramii* is still considered a rare cephalopod in the Mediterranean Sea. In this note I report some field observations from the Gulf of Taranto (North Ionian Sea, Eastern Mediterranean Sea) during a swordfish fishing cruise which show that *O. bartramii* is apparently not rare in this district.

MATERIALS AND METHODS

The observations were carried out on 13.ix.2006, in the Gulf of Taranto at about

40°02'N 17°32'E, water depth ca. 900 m, during a swordfish fishing cruise aboard the boat *Medusa* based in Porto Cesareo (province of Lecce). The boat was equipped with a 400-watt electric lamp, 3 m above the sea surface on the port side. The light of this lamp attracted many animals. During the time elapsed between the end of longline paying out operations and the start of longline retrieving (meanwhile the boat was left to float) the area of lightened sea surface was closely inspected for about 45 minutes, from about 11:00 pm to 11:45 pm. Attempts were made to catch, with the help of a dip-net, some light-attracted animals. The observations could not be carried on any longer because of the quite rough sea conditions.

The dip-netted squid were identified soon after their capture, approximately measured (mantle length, ML), and, all but one, released. The only two species netted and identified, namely *Ommastrephes bartramii* and *Todarodes sagittatus* (Lamarck, 1798), were distinguished by their general appearance as well as skin colour pattern, shape of tentacles, and shape of the funnel pit (Naef, 1923).The stomach contents of the five caught swordfish were cursorily examined soon after their capture and dressing.

RESULTS

While observing the sea surface under the light cone, we noticed three squid that came into sight near the surface swimming backward by regular jetting. In addition to the squid, some small fish (about 5 to 10 cm long) were visible. Every once in a while squid made jerky forward motions that we interpreted as attempts to catch prey. During their swimming some squid surfaced for just fractions of a second. After we tried to catch the squid by a dip net, they swam away; however, after a few minutes they reappeared. It was not possible to determine whether they were the same or other individuals.

Six dip net capture attempts were successful: four individuals of *Ommastrephes bartramii* (fig. 1) and two of *Todarodes sagittatus* were caught. Their size ia reported in table 1. No hectocotylization was observed in any squid, which was probably due to the immature condition of the probable male squid. Following their release the squid dived out of sight.

When the longline was retrieved after four hours, several bait-mackerel showed possible signs of squid feeding; viz. V-shaped incisions on the border of bite-wounds that fit well the shape of the rostrum of squid beaks(fig. 2).

One swordfish stomach contained comparatively fresh remains of a *T. sagittatus* specimen (fig. 3).

Species	ML (cm)	destination
Ommastrephes bartramii	20.5, immature	collected
Ommastrephes bartramii	15	released
Ommastrephes bartramii	18	released
Ommastrephes bartramii	23	released
Todarodes sagittatus	18	released
Todarodes sagittatus	19	released

Table 1. List of dip-netted squid, their size (mantle length, ML) and final destination.

DISCUSSION

The present results seemingly show that *Ommastrephes bartramii* is not rare in the Gulf of Taranto. They match Orsi Relini's (1990) observations in the Ligurian Sea (western Mediterranean) and thus prove that this squid is most probably common in the whole Mediterranean basin. Hence this elusive oceanic cephalopod should be labelled "rarely

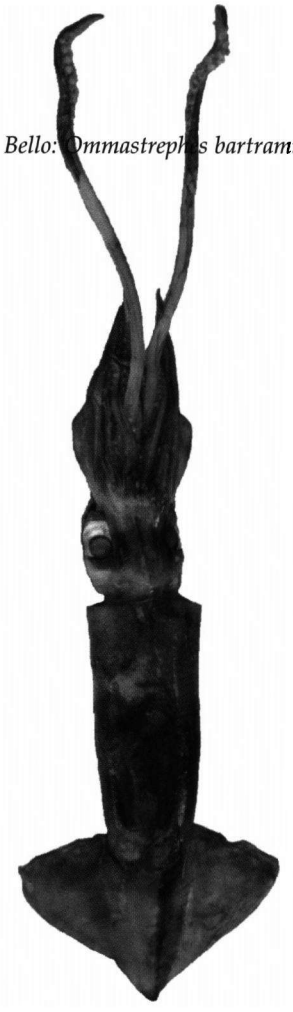

Fig. 1. Immature specimen of *Ommastrephes bartramii*. ML=20.5 cm

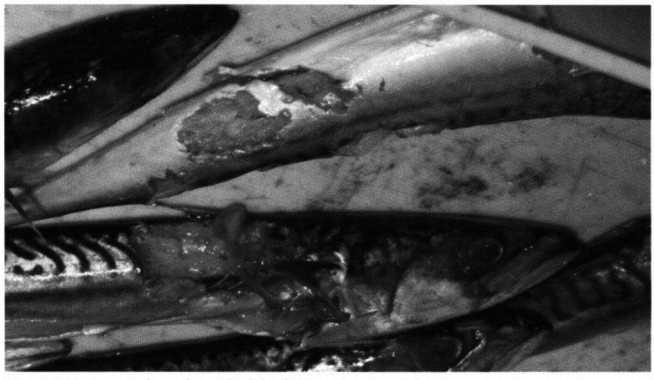

Fig. 2. Bait mackerel probably bitten by squid.

Fig. 3. Stomach contents of a swordfish; the largest prey item is a specimen of *Todarodes sagittatus*.

caught" rather than "rare", as has been the case of several oceanic squids (e.g. Bello, 2000). The occurrence of *Todarodes sagittatus* in the Gulf of Taranto on the contrary, is well established (Bello, 1987).

Orsi Relini (1990) showed that Mediterranean *T. sagittatus* and *O. bartramii* inhabit different depth zones. She collected light attracted juveniles of the former species in waters above the slope, 500 to 700 m deep, and juveniles of the latter species in waters deeper than 1000 m. The squid reported in the present note were dip-netted at the surface in just one place, where the bottom is at about 900 m, that is a depth intermediate to those reported by Orsi Relini (1990) for the two ommastrephid squids respectively. The Gulf of Taranto collecting site possibly represents an overlap zone for the two species.

Contrary to other elusive large oceanic squid, such as *Todarodes sagittatus* and *Histioteuthis bonnellii* (Férussac, 1835), *O. bartramii* is not listed among the most abundant prey items of teuthophagous predators (Orsi Relini et al., 1994; Bello, 1997). Therefore the examination of predator stomach contents as a means to collect oceanic cephalopods that avoid man made devices is not appropriate to obtain good information on *O. bartramii*.

Although *O. bartramii* largely escapes fishing gear and seemingly predators, it can be attracted and its presence recorded by light, as shown once again in this note. The artificial light attraction in oceanic cephalopods (Clarke & Pascoe, 1998), including *O. bartramii*

(Inada et al., 1996), is a well-documented phenomenon. In this respect the attraction of potential squid prey items by overboard light (Orsi Relini, 1990; present results) might represent an additional luring factor for ommastrephid squid.

Additionally, I can report that according to swordfish fishermen their longline bait draws mostly squid that, whilst feeding, in turn attract swordfish. This is indeed an old story that has been informally debated, but there is no sound evidence. The signs of probable squid feeding on bait-mackerel (fig. 2) hint that the fishermen's assertion might be true; moreover the fact that *T. sagittatus* is the most important swordfish prey item (Bello, 1997) (fig. 3) also supports such a hypothesis. However, one wonders why *O. bartramii* remains are rarely found in swordfish stomach contents, as well as in those of other oceanic predators (Orsi Relini et al., 1994; Bello, 1997), despite its abundance. In other words, what mechanisms enhance its avoidance of potential predators?

ACKNOWLEDGEMENTS

I am grateful to captain Mario Peluso and his sons Simone and Ivano for the warm hospitality on their boat and for their help in observing and collecting squid.

REFERENCES

BELCARI, P., 1999. *Ommastrephes bartramii*. In: G. RELINI, J. BERTRAND & A. ZAMBONI, eds, Sintesi delle conoscenze sulle risorse da pesca dei fondi del Mediterraneo centrale (Italia e Corsica). - Biologia Marina Mediterranea 6 (suppl. 1): 721-724.

BELLO, G., 1987. Elenco dei cefalopodi del Golfo di Taranto. - Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano 128: 173-179.

BELLO, G., 1997. Teuthophagous predators as collectors of oceanic cephalopods: the case of the Adriatic Sea. - Bollettino Malacologico 32: 71-78.

BELLO, G., 2000. How rare is *Histioteuthis bonnellii* (Cephalopoda: Histioteuthidae) in the eastern Mediterranean Sea? - Journal of Molluscan Studies 66: 575-577.

BELLO, G., 2003. The biogeography of Mediterranean cephalopods. - Biogeographia 24: 209-226.

CLARKE, M.R., & P.L. PASCOE, 1998. The influence of an electric light on the capture of oceanic cephalopods by a midwater trawl. - Journal of the Marine Biological Association of the United Kingdom 78: 561-575.

GUERRA, A., 1992. Mollusca, Cephalopoda. Fauna Ibérica 1: 1-327. Madrid, Spain.

INADA, H., S. HIROKAWA & A. YATSU, 1996. Effect of underwater fishing light on daytime jigging operation for large size neon flying squid *Ommastrephes bartrami*. - Nippon Suisan Gakkaishi 62: 73-77. [in Japanese with English abstract]

MANGOLD-WIRZ, K., 1963. Biologie des céphalopodes benthiques et nectoniques de la Mer Catalane. - Vie et Milieu 13 (suppl.) : 1-285.

NAEF, A., 1923. Die Cephalopoden. - Fauna e Flora del Golfo di Napoli 35(I, I): 1-863.

NESIS, K.N., 1987. Cephalopods of the world: 1-351. Neptune City, N.J., USA.

OKUTANI, T., 1977. Stock assessment of cephalopod resources fished in Japan. - FAO Fishery Technical Papers 173: 1-62.

ORSI RELINI, L., 1990. Field observations of young *Ommastrephes bartrami* in offshore waters in the Ligurian Sea. - Rapports et procès-verbaux des réunions de la Commission Internationale pour l'Exploration Scientifique de la Mer Méditerranée 32(1): 243.

ORSI RELINI, L., F. GARIBALDI, G. PALANDRI & C. CIMA, 1994. La comunità mesopelagica e i predatori "di superficie". - Biologia Marina Mediterranea 1(1): 105-112.

TORCHIO, M., 1967. Reperti di *Histioteuthis bonelliana* (Férussac) e di *Ommastrephes bartrami* (Lesueur) in acque neritiche del Golfo di Taranto (Cephalopoda, Dibranchiata). - Thalassia Salentina 2: 1-7.