

A. NERI^{1,2}, P. SARTOR², C. MANCUSI^{1,3}, A. VOLIANI⁴, D. CAPUA⁴, L. MARSILI¹

¹Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente, Università di Siena, Siena, Italy.

²CIBM, Consorzio per il Centro Interuniversitario di Biologia Marina ed Ecologia Applicata, Livorno, Italy.

³ARPAT, Agenzia Regionale per la Protezione Ambientale della Toscana, Livorno, Italy.

⁴Ricercatore Indipendente.

alessandra.neri@student.unisi.it

PRELIMINARY NOTES ON THE DIET OF *LAMPRIS GUTTATUS* (BRÜNNICH, 1788) IN THE SOUTHERN LIGURIAN SEA

NOTE PRELIMINARI SULLA DIETA DI *LAMPRIS GUTTATUS* (BRÜNNICH, 1788) NEL MAR LIGURE MERIDIONALE

Abstract - Stomach contents of 2 opah *L. guttatus* collected in the southern Ligurian Sea were analyzed. Remains were found highly digested, mostly consisting on chitinous mandibles (beaks) of cephalopods. Preliminary results on feeding habits of opah in the Mediterranean Sea show essentially the presence of nektonic prey distributed in the water column. They were mainly meso-batypelagic cephalopods species, with a great abundance of armed helmet squid *Galiteuthis armata*, which is considered a cephalopod rare species in the Mediterranean Sea.

Key-words: diet, *Lampris guttatus*, *Galiteuthis armata*, marine biodiversity, southern Ligurian Sea.

Introduction – The opah *Lampris guttatus* (Brünnich, 1788) is a cosmopolitan epimesopelagic species of temperate and tropical waters, with apparently solitary habits (Fischer *et al.*, 1987). Although opah is considered a rare species in the Mediterranean (Fischer *et al.*, 1987), its presence is well documented (Sinis, 2004; Dulčić *et al.*, 2005; Psomadakis *et al.*, 2006; Ligas *et al.*, 2009; Francour *et al.*, 2010), but there is still few knowledge about its biology and ecology, including the diet. Currently, much of dietary informations come from other seas. Feeding habits of opah mainly consisting on mesopelagic preys, such as cephalopods, especially teutids, bony fishes and less frequently crustaceans and gelatinous invertebrates (Fischer *et al.*, 1987; Choy *et al.*, 2013).

In this study, stomach contents composition of two *L. guttatus* specimens found in Tuscany (northwestern Mediterranean Sea) are shown.

Materials and methods - Two specimens of opah were collected along the northern coast of the Tuscany. After dissection, stomachs were collected by the personnel of the Regional Agency for Environmental Protection (ARPAT) of Livorno (Tuscany, Italy). Stomach contents, after being washed in a sieve with 0.3 mm mesh, were preserved in a solution of 75% ethanol, then the analysis was performed under a stereomicroscope. The prey identification was carried out both using specific guides (Clarke, 1986) and comparing undigested remains found in stomachs with original samples. Prey items were identified at the lowest taxonomic level possible, although they were found to be highly digested.

Results - The first opah RT1Lg (Fig. 1a) was found stranded dying in Vada (LI) in 2008, already reported by Ligas *et al.* (2009), while the second fish, RT2Lg (Fig. 1b), was caught with a trammel net in Marina di Pisa (PI) in 2016. More detailed information of examined specimens are shown in Tab. 1.

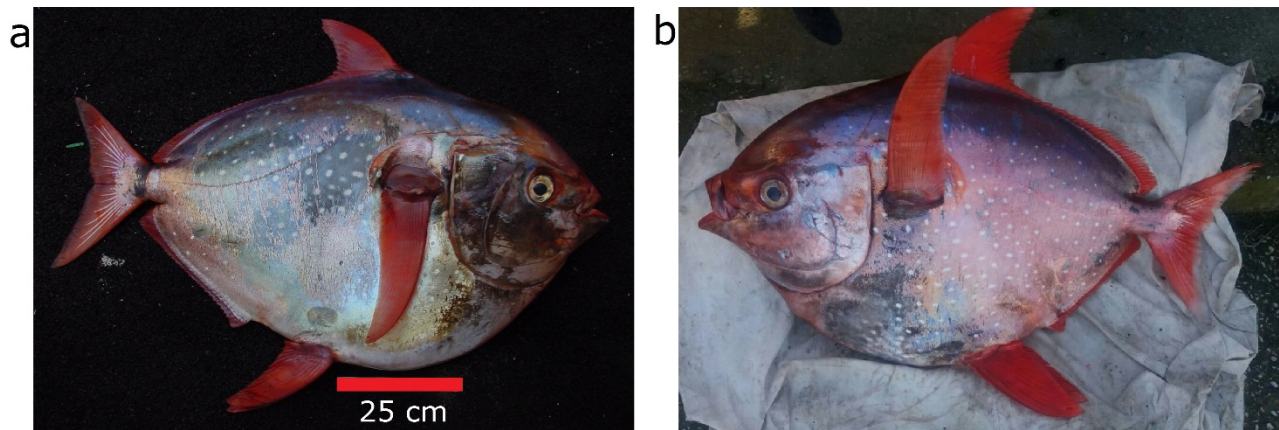


Fig. 1 – Opah analyzed in the present study: (a) RT1Lg; (b) RT2Lg.
Pesci re analizzati in questo studio: (a) RT1Lg; (b) RT2Lg.

Tab. 1 – Data of opah analyzed in this study. * = estimated length and weight.
*Dati dei pesci re analizzati in questo studio. * = lunghezza e peso stimati.*

Code	Date of collection	Coordinates	Total length (cm)	Weight (kg)	Sex
RT1Lg	8 August 2008	43°21'12"N 10°26'34"E	110	40	male
RT2Lg	30 December 2016	43°40'21"N 10°16'14"E	100*	35*	unknown

During the stomach contents analysis, a total of 506 cephalopod beaks (230 lower and 276 upper), two mandibles of unidentified bony fishes and remains of a mysidacean were found (Tab. 2). Concerning cephalopods, from the taxonomic analysis a total of 279 cephalopods, belonging to 8 taxa, were identified.

Tab. 2 – Numerical abundance of prey items (N), lower (N Lb) and upper beaks (N Ub) of cephalopods identified in *L. guttatus* analyzed in this study.
*Abbondanza numerica delle prede (N), dei becchi inferiori (N Lb) e superiori (N Ub) dei cefalopodi identificati nei *L. guttatus* analizzati in questo studio.*

Prey item	RT1Lg			RT2Lg		
	N	N Lb	N Ub	N	N Lb	N Ub
OSTEICHTHYES						
Osteichthyes n.d.	1			1		
CEPHALOPODA						
Cranchiidae						
<i>Galiteuthis armata</i> Joubin, 1898	202	181	202	1	1	1
Enoploteuthidae						
<i>Abralia veranyi</i> (Rüppell, 1844)	1	1				
Histioteuthidae						
<i>Histioteuthis</i> sp.	3	3	3	1		1

Prey item	RT1Lg			RT2Lg		
	N	N Lb	N Ub	N	N Lb	N Ub
Octopodidae						
<i>Eledone</i> sp.	1		1			
Ommastrephidae						
Ommastrephidae n.d.	7	7	7	3	3	1
Onychoteuthidae						
<i>Ancistroteuthis lichtensteinii</i> (Férussac [in Férussac & d'Orbigny], 1835)	34	24	34			
Sepiolidae						
<i>Heteroteuthis dispar</i> (Rüppell, 1844)	10	9	10			
Cephalopoda n.d.	15		15	1	1	1
Total Cephalopoda	273	225	272	6	5	4
CRUSTACEA						
Mysidae						
Mysidae n.d.	1					

Most of cephalopods identified belong to *G. armata* (203) and *A. lichtensteinii* species (34). Except for *H. dispar* (10), for the other preys the taxonomic identification at species level was not possible due to the digestion state of beaks.

Furthermore, in both specimens fragments of translucent plastic (Fig. 2a, c) and fibers (Fig. 2b) were found, the latter probably belonging to fishing nets.

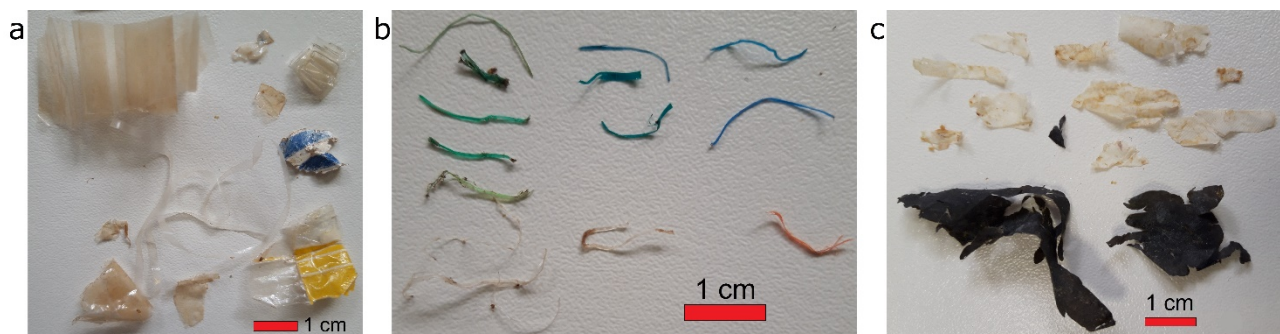


Fig. 2 – Plastic remains found in stomachs of RT1Lg (a, b) and RT2Lg (c).

Resti di plastica trovati negli stomaci di RT1Lg (a, b) e RT2Lg (c).

Conclusions - The absence of fresh remains in examined stomachs indicates that both opah have not fed for a few days. As with other studies in the Mediterranean (Sinis, 2004; Dulčić *et al.*, 2005), cephalopods were the mainly preys identified. In the present note, cephalopods identified were essentially meso-batypelagic species. Noteworthy is the abundant presence of *G. armata*, usually considered a rare species in the Mediterranean and of which there is few knowledge. Furthermore, the discovery of translucent plastic fragments would seem to confirm what is reported in the literature, that *L. guttatus* also feeds on gelatinous invertebrates, including cephalopods (Choy *et al.*, 2013).

The present study not only provides new information on the diet of opah in the Mediterranean Sea, but the large amount of *G. armata* found in stomach contents suggest that this cephalopod is more common than assumed, thus highlighting the importance of stomach contents analysis also as a method for the evaluation of the Mediterranean biodiversity status.

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