

Cephalopod research in the eastern Mediterranean (East of 23°E): a review

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Abstract

This study presents an overview of cephalopod research carried out in the Mediterranean Sea, East of 23°E, i.e., in the Levant basin, the Aegean Sea and the Sea of Marmara. Relevant studies focused on systematics, zoogeographical distribution, fisheries, reproductive biology, larval development, and stomach contents analyses.

Riassunto

Il presente lavoro propone una sinossi della ricerca teutologica condotta nel Mediterraneo orientale, a est del meridiano 23°E, vale a dire nel bacino di Levante, nel Mar Egeo e nel Mare di Marmara, a partire da Aristotele. Ricerche sistematiche sulla teutofauna di quest'area sono state svolte a far capo dai primi anni '90. I più importanti studi sono stati rivolti alla sistematica, alla distribuzione geografica, alla scienza della pesca, alla biologia della riproduzione, allo sviluppo larvale e all'analisi dei contenuti stomacali di predatori teutofagi. In totale, fino a oggi sono stati registrati nel distretto geografico in questione 54 specie di cefalopodi: 4 sepiidi, 13 sepiolidi, 23 teutidi e 14 ottopodi. Un rilievo particolare è rivestito dai migranti lessepsiani provenienti da Mar Rosso (il sepiide *Sepia pharaonis*, il teutide *Sepioteuthis lessoniana* e gli ottopodi *Octopus cf. aegina/kagoshimensis* e *Octopus cyanea*), le cui prime segnalazioni mediterranee sono occorse proprio nel bacino orientale. In una tabella riassuntiva, è riportato l'elenco delle specie del Mediterraneo orientale, con le referenze bibliografiche attinenti e il relativo soggetto di studio.

Key words

Cephalopoda, Mediterranean Sea, Levant basin, Aegean Sea, Sea of Marmara, review.

Generalities: records and distribution

The first cephalopod records in the eastern Mediterranean (and the ancient-most records worldwide) are given by Aristotle (350 B.C.). A long silence followed Aristotle's work, till half of the 19th century, when Forbes (1844) reported about the presence and distribution of benthic species in the Aegean Sea. Later on, the Ottoman Sultan Abdulhamit asked Ostroumoff (1896) to carry out benthos investigations in the Sea of Marmara and the Bosphorus, and a total of three cephalopod species were reported by that author. Within his comprehensive field works in the Mediterranean and neighbouring sea, Degner (1925) carried out expeditions to the Aegean Sea and the Levant basin, collecting benthic as well as pelagic samples; from a total of 21 sampling stations located in the eastern Mediterranean, three were in the Sea of Marmara, five in the Aegean Sea and four in the Levant basin, the rest being located between 15°E and 23°E. During the middle of the 20th century, Digby (1949) reported about the cephalopod specimens of the Istanbul University Museum collection and some years later, Demir (1952), in a study focused on the invertebrates of the Bosphorus, mentioned some cephalopod species; immediately afterwards, the first checklist of the teuthofauna living in the waters east of 23°E was made available (Rees, 1955). Adam (1967) also carried out studies in the eastern Mediterranean, and reported 23 species in the waters east of 23°E; that number was then increased to

30, with the contribution of Rugby & Knudsen (1972). In later studies, Knudsen (1981, 1992) examined the specimens of the Department of Zoology, Tel-Aviv University, and reported about three sepiolid species and the pelagic octopus *Tremoctopus violaceus*, adding this species to the Mediterranean waters east of 23°E. Teuthological studies based on bottom trawl data was carried out in the Levant basin, south of Cyprus, by Demetropoulos (1969, 1971), and another pelagic species, *Argonauta argo*, was added to the Levant fauna by Popper et al. (1990). Preliminary studies on the cephalopods of the Turkish side of the Aegean Sea were presented by Katağan & Kocatay (1990) to the CIESM congress in Perpignan (France). Contemporary to that, D'Onghia et al. (1992) carried out the first detailed study on the cephalopod biomass of the northern Aegean Sea, within the research project "Fourth Session of the Technical Consultation on Stock Assessment in the Eastern Mediterranean 1990-1991"; the obtained results were the object of several publications afterwards (D'Onghia et al., 1993a, b; D'Onghia et al., 1994; D'Onghia et al., 1995; D'Onghia et al., 1996). Within a cooperation between Turkey and Japan, the research project "Demersal Fisheries Resource Survey in the Republic of Turkey" took place between 1991 and 1993, and cephalopods resources were studied from the Sea of Marmara to the northeastern Mediterranean coasts of Turkey by JICA, the "Japan International Cooperation Agency".

Other results obtained from the Sea of Marmara, the

SPECIES	REFERENCES	RS	SEA
SEPIIDA			
<i>Sepia officinalis</i> Linnaeus, 1758	Forbes, 1844 Gruvel, 1931 Bodenheimer, 1937 Demir, 1952 Rees, 1955 Adam, 1967 Demetropoulos, 1969 Demetropoulos, 1971 Ruby & Knudsen, 1972 Katağan & Kocatas, 1990 D'Onghia et al., 1992 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1988 Salman et al., 2001 Belcari et al., 2002 Kabasakal, 2002 Laptikhovsky et al., 2003 Lefkaditou et al., 2003 Önsoy & Salman, 2004 Salman, 2004	D D D D D D D D D, M D D E D D SCM C SCF RB D RB SCF	AS L L SM L L L L L L AS AS AS AS L AS AS AS AS AS AS, L AS
<i>Sepia pharaonis</i> Ehrenberg, 1831	Mienis, 2003b	D	L
<i>Sepia elegans</i> Blainville, 1827	Digby, 1949 Rees, 1955 Adam, 1967 Demetropoulos, 1969 Demetropoulos, 1971 Ruby & Knudsen, 1972 Katağan & Kocatas, 1990 D'Onghia et al., 1992 Katağan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Ünsal et al., 1999 Kabasakal, 2002 Lefkaditou et al., 2003	D D D D D D, M D D, B D D E D, C D E SCF D	SM L L L L L AS AS SM AS AS AS L SM AS AS
<i>Sepia orbignyana</i> Férussac, 1826	Adam, 1967 Ruby & Knudsen, 1972 Katağan & Kocatas, 1990 D'Onghia et al., 1992 Katagan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Ünsal et al., 1999 Kabasakal, 2002 Lefkaditou et al., 2003	D D, M D D, B D D E D, C D E SCF D	L L AS AS L AS AS AS L SM AS AS
SEPIOLIDA			
<i>Sepiola rondeletii</i> Leach, 1817	Forbes, 1844 Demir, 1952 Demetropoulos, 1969 Demetropoulos, 1971 Ruby & Knudsen, 1972 D'Onghia et al., 1992 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Lefkaditou et al., 2003 Lefkaditou & Kaspiris, 2005	D D D D D, M D E D D D A, B	AS SM L L L AS AS AS L AS AS

SPECIES	REFERENCES	RS	SEA
<i>Sepiola affinis</i> Naef, 1912	D'Onghia et al., 1992 D'Onghia et al., 1996 Lefkaditou et al., 2003 Lefkaditou & Kaspiris, 2005	D E D A, B	AS AS AS AS
<i>Sepiola intermedia</i> Naef, 1912	D'Onghia et al., 1996 Salman et al., 1997 Lefkaditou et al., 2003 Salman, 2004 Salman & Önsoy, 2004 Lefkaditou & Kaspiris, 2005	E D D SCF F A, B	AS AS AS AS AS AS
<i>Sepiola ligulata</i> Naef, 1912	D'Onghia et al., 1992 D'Onghia et al., 1996 Lefkaditou et al., 2003 Lefkaditou & Kaspiris, 2005	D E D A, B	AS AS AS AS
<i>Sepiola robusta</i> Naef, 1912	Ruby & Knudsen, 1972 Salman et al., 1997 Salman et al., 1998 Lefkaditou et al., 2003 Salman, 2004 Salman & Önsoy, 2004	D, M D D D SCF F	L AS L AS AS AS
<i>Sepiola steenstrupiana</i> Levy, 1912	Knudsen, 1981 Salman et al., 1998 Salman & Önsoy, 2004	D D F	L L L
<i>Rondeletiola minor</i> (Naef, 1912)	Adam, 1967 Knudsen, 1981 Katağan & Kocatas, 1990 D'Onghia et al., 1992 Katağan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman & Katağan, 1996 Salman et al., 1997 Ünsal et al., 1999 Lefkaditou et al., 2003 Lefkaditou & Kaspiris, 2005	D D D D D D E RB D E D A, B	L L AS AS AS AS AS AS AS AS SM AS AS
<i>Sepietta oweniana</i> (Orbigny, 1841)	Ostroumoff, 1896 (as <i>Sepiola oweniana</i>) Adam, 1967 Ruby & Knudsen, 1972 Katağan & Kocatas, 1990 D'Onghia et al., 1992 Katağan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman, 1998 Salman et al., 1998 Lefkaditou & Kaspiris, 1999 Ünsal et al., 1999 Kabasakal, 2002 Lefkaditou et al., 2003 Salman, 2004 Lefkaditou & Kaspiris, 2005	D D D, M D D D D D E D RB D MC E SCF D SCF A, B	SM L L AS AS SM AS AS AS AS L L AS SM AS AS AS
<i>Sepietta neglecta</i> Naef, 1916	Digby, 1949 Rees, 1955 Ruby & Knudsen, 1972 Katağan et al., 1993 Salman et al., 1997 Lefkaditou & Kaspiris, 1998 Lefkaditou & Kaspiris, 1999 Lefkaditou et al., 2003 Lefkaditou & Kaspiris, 2005	D D D, M D D RB MC D A, B	SM L L SM AS AS AS AS AS AS

SPECIES	REFERENCES	RS	SEA
<i>Alloteuthis media</i> (Linnaeus, 1758)	Digby, 1949 Demir, 1952 (as <i>Loligo marmorae</i>) Rees, 1955 Adam, 1967 Ruby & Knudsen, 1972 Katağan & Kocatas, 1990 D'Onghia et al., 1992 Katağan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Ünsal et al., 1999 Salman et al., 2002 Laptikhovsky et al., 2002 Lefkadiou et al., 2003 Salman, 2004 (as <i>Loligo media</i>) Laptikhovsky et al., 2005	D D D D D D D D D E D, C D E D S, B D SCF S, B	SM SM L L L AS AS SM AS AS AS L SM L AS AS AS AS, L
<i>Alloteuthis subulata</i> Lamarck, 1798	Gruvel, 1931 Rees, 1955 Ruby & Knudsen, 1972 D'Onghia et al., 1992 D'Onghia et al., 1996 Salman et al., 1997 Lefkadiou et al., 2003	D D D, M D E D D	L L L AS AS AS AS
<i>Sepioteuthis lessoniana</i> Férussac, 1830	Salman & Katağan, 2002 Salman, 2003	D D	L L
Oegopsina			
<i>Abralia veranyi</i> (Rüppell, 1844)	Adam, 1967 Ruby & Knudsen, 1972 D'Onghia et al., 1992 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Lefkadiou et al., 2003 Mienis, 2004b Peristeraki et al., 2005 Salman & Laptikhovsky, 2005 Oztürk et al., 2007	D D D D E D D D SCF F SCM	L L AS AS AS AS AS L AS AS AS
<i>Abraliopsis morisii</i> (Verany, 1839)	Degner, 1925 Rees, 1955 Adam, 1967 Ruby & Knudsen, 1972 Lefkadiou et al., 2003 (as <i>A. pfefferi</i>)	D D D D D	AS, L L L L AS
<i>Ancistrocheirus lesueurii</i> (Orbigny, 1842)	Salman et al., 2002 Lefkadiou et al., 2003 Roberts, 2003 Salman et al., 2003 Oztürk et al., 2007	D D SCM JD SCM	AS AS L AS AS
<i>Pyroteuthis margaritifera</i> (Rüppell, 1844)	Degner, 1925 Rees, 1955 Ruby & Knudsen, 1972 Roper, 1974 D'Onghia et al., 1995 D'Onghia et al., 1996 Lefkadiou et al., 1999 Lefkadiou et al., 2003 Salman et al., 2003 Lefkadiou et al., 2005 Oztürk et al., 2007	D D D D D E JD D JE, E JD SCM	L L L L AS AS AS AS AS AS AS AS
<i>Octopoteuthis sicula</i> Rüppell, 1844	Degner, 1925 (as <i>Octopodoteuthis sicula</i>) Rees, 1955	D D	L L

SPECIES	REFERENCES	RS	SEA
	Digby, 1949 (as <i>Octopodoteuthis sicula</i>) Ruby & Knudsen, 1972 (as <i>Octopodoteuthis sicula</i>) Lefkadiou et al., 2003 Roberts, 2003 Oztürk et al., 2007	D D D SCM SCM	SM L AS L AS
<i>Onychoteuthis banksi</i> (Leach, 1817)	Degner, 1925 Rees, 1955 Adam, 1967 Ruby & Knudsen, 1972 Roper, 1974 Lefkadiou et al., 2003 Roberts, 2003 Oztürk et al., 2007	D D D D D D SCM SCM	AS AS L L L L AS L AS
<i>Ancistroteuthis lichtensteinii</i> Férussac, 1835	Lefkadiou et al., 1999 Lefkadiou et al., 2000 Salman et al., 2002 Lefkadiou et al., 2003 Roberts, 2003 Salman, 2004	JD D D D SCM SCF	AS AS AS AS L AS
<i>Histioteuthis bonnellii</i> (Férussac, 1835)	D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Lefkadiou et al., 1999 Lefkadiou et al., 2003 Salman et al., 2003 Roberts, 2003 Salman, 2004 Peristeraki et al., 2005 Oztürk et al., 2007	D E D JD D JD SCM SCF SCF SCM	AS AS AS AS AS AS L AS AS AS AS
<i>Histioteuthis reversa</i> (Verrill, 1880)	D'Onghia et al., 1992 D'Onghia et al., 1995 D'Onghia et al., 1996 Lefkadiou et al., 1999 Lefkadiou et al., 2003 Roberts, 2003 Salman et al., 2003 Peristeraki et al., 2005 Oztürk et al., 2007	D D E JD D SCM JD SCF SCM	AS AS AS AS AS L AS AS AS AS
<i>Chtenopteryx sicula</i> (Verany, 1851)	Degner, 1925 Rees, 1955 Adam, 1967 Ruby & Knudsen, 1972 Roper, 1974 Mienis, 1995 Lefkadiou et al., 2003 Salman et al., 2003 Oztürk et al., 2007	D D D D D D D JD SCM	L L L L L L AS AS AS
<i>Brachiotheuthis riisei</i> (Steenstrup, 1882)	Degner, 1925 Rees, 1955 Ruby & Knudsen, 1972 Lefkadiou et al., 2000 Lefkadiou et al., 2003 Salman et al., 2003 Oztürk et al., 2007	D D D D D JD SCM	AS, L AS, L L AS AS AS AS
<i>Illex coindetii</i> (Verany, 1839)	Degner, 1925 Adam, 1967 Ruby & Knudsen, 1972 D'Onghia et al., 1992 Katagan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997	D D D, M D, B D D E D, C	SM L L AS SM AS AS AS

SPECIES	REFERENCES	RS	SEA
	Salman et al., 1998 Kabasakal, 2002 Lefkadiou et al., 2003 Salman et al., 2003 Salman, 2004 Lefkadiou et al., 2005 Peristeraki et al., 2005	D SCF D JD SCF JD, A SCF	L AS AS AS AS AS AS
<i>Todarodes sagittatus</i> (Lamarck, 1798)	Demir, 1952 (as <i>Ommatostrephes sagittatus</i>) Demetropoulos, 1969 (as <i>Ommatostrephes sagittatus</i>) Demetropoulos, 1971 (as <i>Ommatostrephes sagittatus</i>) Katağan & Kocatas, 1990 D'Onghia et al., 1992 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Kabasakal, 2002 Lefkadiou et al., 2003 Salman, 2004 Peristeraki et al., 2005 Oztürk et al., 2007	D D D D D D D D, C D SCF D SCF SCF SCM	SM L L AS AS AS AS AS L AS AS AS AS AS
<i>Todaropsis eblanae</i> (Ball, 1841)	Adam, 1967 Ruby & Knudsen, 1972 D'Onghia et al., 1992 Katağan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Kabasakal, 2002 Lefkadiou et al., 2003 Salman, 2004	D D D D D E D D SCF D SCF	L L AS SM AS AS AS L AS AS AS
<i>Ommastrephes bartramii</i> (Lesueur, 1821)	Salman et al., 1992 Lefkadiou et al., 2003 Salman, 2004 Oztürk et al., 2007	D D SCF SCM	AS AS AS AS
<i>Thysanoteuthis rhombus</i> Troschel, 1857	Vardala-Theodorou et al., 1991 Lefkadiou et al., 2003 Salman et al., 2003	D D JD	AS AS AS
<i>Chiroteuthis veranii</i> (Férussac, 1835)	Degner, 1925 Rees, 1955 Adam, 1967 Ruby & Knudsen, 1972 Lefkadiou et al., 1999 Lefkadiou et al., 2003 Roberts, 2003 Salman et al., 2003 Oztürk et al., 2007	D D D D JD D SCM JD SCM	SM SM L L AS AS L AS AS
<i>Galiteuthis armata</i> Joubin, 1898	Degner, 1925 (as <i>Taonidium pfefferi</i>) Rees, 1955 (as <i>Taonidium pfefferi</i>) Ruby & Knudsen, 1972 (as <i>Taonidium pfefferi</i>)	D D D	L L L
OCTOPODA			
<i>Octopus vulgaris</i> Cuvier, 1797	Forbes, 1844 Degner, 1925 Gruvel, 1931 Bodenheimer, 1937 Rees, 1955 Adam, 1967 Demir, 1952 Demetropoulos, 1969	D D D D D D D D	AS SM L L L L SM L

SPECIES	REFERENCES	RS	SEA
	Demetropoulos, 1971 Ruby & Knudsen, 1972 Baras & Danin, 1988 Katağan & Kocatas, 1990 D'Onghia et al., 1992 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Lefkaditou et al., 1999 Kallianatos et al., 2001 Lefkaditou et al., 2003 Salman et al., 2003 Katsanevakis & Verriopoulos, 2004 Lefkaditou et al., 2005	D D, M D D D E D, C D JD C D JE, D A JD, A	L L AS AS AS AS AS L AS AS AS AS AS AS
<i>Octopus cyanea</i> Gray, 1849	Mienis, 2003a	D	L
<i>Octopus defilippi</i> Verany, 1851	Adam, 1967 Ruby & Knudsen, 1972	D D, M	L L
<i>Octopus cf. aegina/kagoshimensis</i> Ortmann, 1888	Salman et al., 1999 Salman & Katağan, 2002 (as <i>Octopus aegina</i>) Mienis, 2005b (as <i>Octopus cf. aegina</i>) Salman et al., 2005 (as <i>Octopus kagoshimensis</i>)	D, B D D F	AS, L L L L
<i>Octopus macropus</i> Risso, 1826	Gruvel, 1931 Bodenheimer, 1937 Demir, 1952 Rees, 1955 Adam, 1967 Demetropoulos, 1969 Demetropoulos, 1971 Ruby & Knudsen, 1972 Barash & Danin, 1988 Salman et al., 1997 Lefkaditou et al., 2003 Salman, 2004	D D D D D D D, M D D D SCF	L L SM L L L L L AS AS AS AS
<i>Octopus salutii</i> Verany, 1839	Rubty & Knudsen, 1972 D'Onghia et al., 1992 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Lefkaditou et al., 1999 Lefkaditou et al., 2003	D, M D D E D, C JD D	L AS AS AS AS AS AS
<i>Pteroctopus tetracirrhus</i> (Delle Chiaje, 1830)	Adam, 1967 D'Onghia et al., 1992 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Lefkaditou et al., 2003 Lefkaditou et al., 2005	D D D E D, C D JD	L AS AS AS AS AS AS
<i>Scaeurus unicolorrhus</i> (Delle Chiaje, 1839)	Degner, 1925 Rees, 1955 Adam, 1967 Ruby & Knudsen, 1972 D'Onghia et al., 1992 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Lefkaditou et al., 2003 Mienis, 2004a Lefkaditou et al., 2005	D D D D D D E D D D D JD	AS AS L L AS AS AS AS L AS L AS

SPECIES	REFERENCES	RS	SEA
<i>Eledone moschata</i> (Lamarck, 1798)	Gruvel, 1931 Bodenheimer, 1937 Digby, 1949 Demir, 1952 Rees, 1955 Adam, 1967 Demetropoulos, 1969 (as <i>Ozaena moschata</i>) Demetropoulos, 1971 (as <i>Ozaena moschata</i>) Ruby & Knudsen, 1972 Barash & Danin, 1988 Katağan & Kocatas, 1990 D'Onghia et al., 1992 Katağan et al., 1993 D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 1998 Salman & Katağan, 1999 Ünsal et al., 1999 Salman et al., 2000 Lefkadiou et al., 2001 Salman, et al., 2001 Lefkadiou et al., 2003 Önsoy & Salman, 2004 Salman, 2004	D D D D D D D D D, M D D D D D E D, C D, A D E A, E C, A SCM D RB SCF	L L SM SM L L L L L AS AS AS SM AS AS AS L AS AS AS AS AS AS AS AS AS AS AS
<i>Eledone cirrhosa</i> (Lamarck, 1798)	Ostroumoff, 1896 (as <i>Eledone aldrovandi</i>) Adam, 1967 D'Onghia et al., 1992 D'Onghia et al., 1995 Lefkadiou & Papaconstantinou, 1995 Tursi et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman & Katağan, 1999 Ünsal et al., 1999 Salman et al., 2000 Lefkadiou et al., 2001 Salman et al., 2002 Lefkadiou et al., 2003 Salman et al., 2003 Lefkadiou et al., 2005	D D D, B D D, M B E D, C D, A E A, E C D D JD JD	SM L AS AS AS AS AS AS AS AS SM AS AS L AS AS AS AS
<i>Bathypolypus sponsalis</i> (Fischer & Fischer, 1892)	D'Onghia et al., 1992 D'Onghia et al., 1993a D'Onghia et al., 1995 D'Onghia et al., 1996 Salman et al., 1997 Salman et al., 2001 Lefkadiou et al., 2003	D B D E D SCM D	AS AS AS AS AS AS AS
<i>Tremoctopus violaceus</i> Della Chiaje, 1830	Knudsen, 1992 Vardala-Theodorou, 1994 Salman et al., 2002 Laptikhovsky & Salman, 2003 Lefkadiou et al., 2003 Salman, 2004	D, B D D RB D SCF	L AS AS AS AS AS
<i>Ocythoe tuberculata</i> Rafinesque, 1814	Robson, 1932 Rees, 1955 Ruby & Knudsen, 1972 Katağan & Kocatas, 1990 Corsini & Lefkadiou, 1995 Laptikhovsky & Salman, 2003 Lefkadiou et al., 2003 Peristeraki et al., 2005	D D D D D, B RB D SCF	L L L AS AS AS AS AS AS

SPECIES	REFERENCES	RS	SEA
<i>Argonauta argo</i> Linnaeus, 1758	Adam, 1967	D	L
	Demetropoulos, 1969	D	L
	Demetropoulos, 1971	D	L
	Ruby & Knudsen, 1972	D	L
	Popper et al., 1990	D	L
	Salman et al., 1997	D	AS
	Salman et al., 1998	D	L
	Laptikhovskiy & Salman, 2003	RB	AS
	Lefkaditou et al., 2003	D	AS
	Salman et al., 2003	JD	AS
	Salman, 2004	SCF	AS
	Peristeraki et al., 2005	SCF	AS
	Öztürk et al., 2007	SCM	AS

Tab. 1. List of cephalopod species of the eastern Mediterranean and their relevant references, in chronological order, with research subject, **RS** (A: abundance; AQ: aquaculture; B: biology; C: catch record; D: distribution; E: ecology; F: fecundity; JD: juvenile distribution; JE: juvenile ecology; M: maturation; MC: morphometric characteristics; RB: reproductive biology; S: systematics; SCM: mammals stomach contents; SCF: fish stomach contents) and distribution, **SEA** (AS: Aegean Sea; L: Levant basin; SM: Sea of Marmara). Species nomenclature according to Sweeney & Roper (1998).

Tab. 1. Lista dei cefalopodi del Mediterraneo orientale e principali riferimenti bibliografiche, in ordine cronologico, con soggetto dello studio, **RS** (A: abbondanza; AQ: acquicoltura; B: biologia; C: catture occasionali; D: distribuzione; E: ecologia; F: fecondità; JD: distribuzione di stadi giovanili; JE: ecologia di stadi giovanili; M: maturazione; MC: caratteristiche morfometriche; RB: biologia della riproduzione; S: sistematica; SCM: contenuti stomacali di mammiferi; SCF: contenuti stomacali di pesci) e areale, **SEA** (AS: Mar Egeo; L: bacino di Levante; SM: Mar di Marmara). Nomenclatura specifica secondo Sweeney & Roper (1998).

Aegean Sea, the waters north of Cyprus and off the coasts of Turkey were reported by Katağan et al. (1993), Salman et al. (1997, 1998) and Salman & Katağan (2004), respectively. The fisheries and abundance of some commercial species in the Aegean Sea were studied by Salman & Katağan (1999), Salman et al. (2000), Kallianiotis et al. (2001), and Lefkaditou et al. (2001). The recentmost faunistic study of the Sea of Marmara was conducted by Ünsal et al. (1999), while other recent studies in the Turkish waters and the Aegean Sea were carried out by Salman et al. (2002) and Lefkaditou et al. (2003). Finally, four species were added to the Israeli teuthofauna by Mienis (1995, 2004a, b, 2005a).

Pelagic fauna and larval research

Relatively less is known on the pelagic Mediterranean teuthofauna. This gap was filled to a certain extent by Roper (1974) within the framework of a project carried out by the Smithsonian Institution. Roper gathered important information on the vertical distribution of pelagic Mediterranean cephalopods, based on data obtained from five sampling stations, two of which located in the eastern basin. Other information on the distribution of pelagic cephalopods in the Aegean Sea comes from Vardala-Theodorou et al. (1991), Katağan et al. (1992), Vardala-Theodorou (1994), Corsini & Lefkaditou (1995), and Lefkaditou et al. (2000).

The first study on larval and juvenile cephalopods was carried out by Lefkaditou et al. (1999) in the Aegean Sea, followed by Salman et al. (2003) who also focused on daily vertical migrations of larval and juvenile cephalopods off the Turkish Aegean Sea coasts; Lefkaditou et al. (2005) also accomplished research along the coasts of central Greece.

Biological studies: reproduction, fecundity, feeding strategies

After the clarification of the general outlines of the teuthofauna composition and distribution, scientific research addressed basic biological aspects of species life cycle, including spawning potential, reproductive strategies and the relationship with different environmental features. Relevant studies can be grouped as follows: Sepiida (Laptikhovskiy et al., 2003; Önsoy & Salman 2005), Sepiolida (Salman & Katağan, 1996; Lefkaditou & Kaspiris, 1998, 1999, 2005; Salman, 1998; Salman & Önsoy, 2004), Teuthida (Salman & Laptikhovskiy, 2002; Laptikhovskiy et al., 2002; Salman & Laptikhovskiy, 2005; Laptikhovskiy et al., 2005), and Octopoda (Lefkaditou & Papanconstantinou, 1995; Tursi et al. 1995; Laptikhovskiy & Salman, 2003; Önsoy & Salman, 2004; Salman et al., 2005).

Food web dynamics is mostly addressed by studies focused on stomach contents analysis, many of which deal with cephalopods in the diet of marine fishes (Kabaskal, 2002; Salman, 2004; Peristeraki et al., 2005) and marine mammals (Salman et al., 2001; Roberts, 2003; Öztürk et al., 2007).

The Red Sea immigrants

Studies by Adam (1955, 1959, 1960, 1973) on the cephalopod fauna of the Red Sea are important because they make available valuable data on species that may constitute "immigrants" to the Mediterranean Sea.

Immigration of species from the Red Sea via the Suez Canal (Lessepsian migration) in fact, is a very important aspect to consider when dealing with the local biodiversity and gained increasing attention by the scientific

world, recently. Although Lessepsian cephalopods are represented by a comparatively low number of species, in fact, they play an important role as predators in the eastern Levant ecosystem.

The first Indo-Pacific cephalopod species, i.e. *Octopus cf. aegina/kagoshimensis*, was recorded in the Eastern Mediterranean by Salman et al. (1999) and, afterwards, by Mienis (2005b) as *Octopus cf. aegina*. *Sepioteuthis lessoniana* was then reported by Salman & Katağan (2002) and Salman (2003), followed by *Octopus cyanea* (Mienis, 2003a) and, lastly, *Sepia pharaonis* (Mienis, 2003b).

Even though the majority of the Mediterranean fauna is of Atlantic origin, the increase of biodiversity as a result of the ongoing process of immigration from the Red Sea, deserves increasing scientific attention, because of the interspecific competition that this immigration is likely to determine.

Conclusions

The above mentioned literature represents an important background for all those interested into the cephalopod fauna of the Mediterranean Sea east of 23°E. To make this literature an even more useful tool for the user, the list of cephalopods from this area (Tab. 1) is complemented by records references ordered chronologically, along with synthetic information on the main topic of each publication.

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