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Biology and population dynamics of by-catch fish species of the bottom trawl fishery in the western Mediterranean

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Supplementary Data

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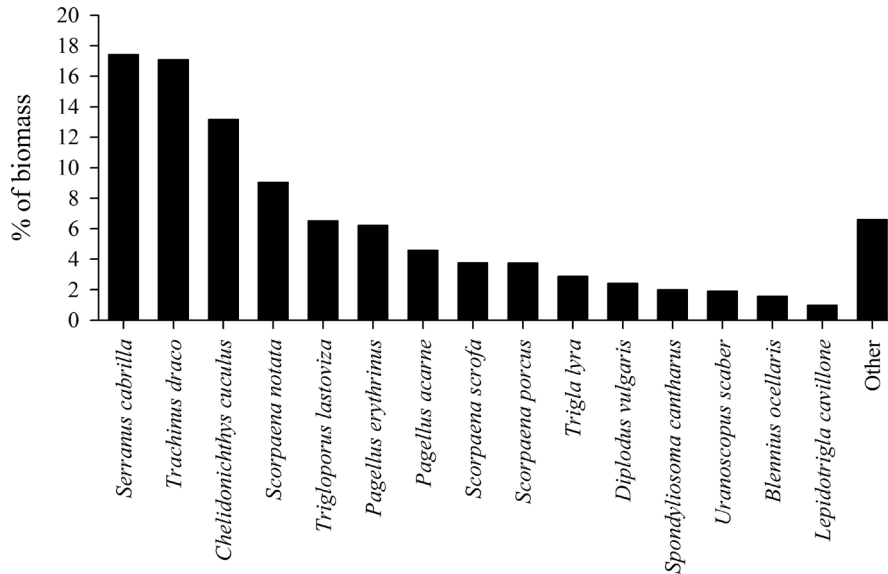


Fig. S1: Species composition (in % of landed biomass) of the mixed fish category (MFC). “Other” are species representing less than 1%: *Trisopterus minutus*, *Zeus faber*, *Diplodus annularis*, *Trachinus radiatus*, *Helicolenus dactylopterus*, *Lepidotrigla dieuzeidei*, *Anthias anthias*, *Microchirus variegatus*, *Citharus linguatula*, *Microchirus ocellatus*, *Peristedion cataphractum*, *Callanthias ruber*, *Scorpaena spp.*, *Scorpaena elongata*, *Sparidae*, *Cepola macrophthalma*, *Phycis blennoides*, *Microchirus spp.*, *Serranus hepatus*, *Lophius piscatorius*, *Phycis phycis*, *Scorpaena lophei*, *Thalassoma pavo*, *Diplodus spp.*, *Gaidropsarus biscayensis*, *Coris julis*, *Illex coindetii*, *Solea spp.*, *Serranus scriba*, *Ophidion barbatum*, *Arnoglossus thori*, *Pagellus spp.*, *Bothus podas*, *Lophius budegassa*, *Lepidorhombus boscii*, *Scomber scombrus*, *Spicara smaris*, *Arnoglossus rueppelii*, *Synchiropus phaeton*, *Centracanthus cirrus*, *Pagellus bogaraveo*, *Merluccius merluccius*, *Arnoglossus imperialis*, *Engraulis encrasicolus*, *Liocarcinus depurator*.

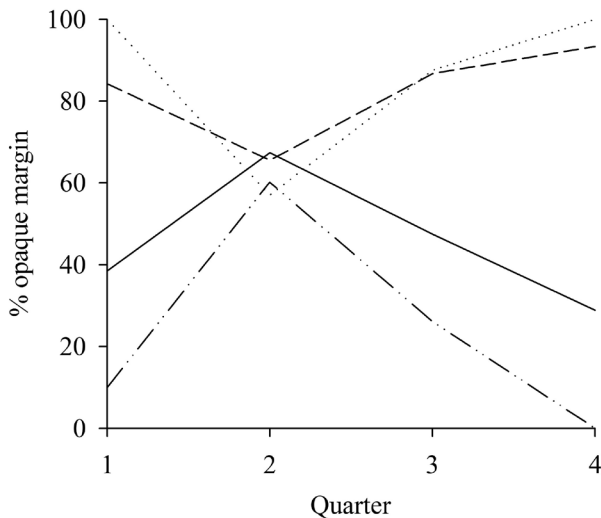


Fig. S2: Quarterly evolution of the % of presence of opaque rings in the margin of the otoliths of the studied species. *Chelidonichthys cuculus*: continuous lines; *Trigloporus lastoviza*: dashed lines; *Serranus cabrilla*: dotted lines; *Trachinus draco*: dash-dotted lines.

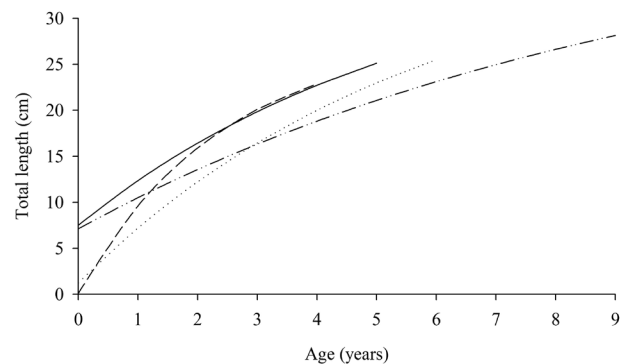


Fig. S3: Fitting of von Bertalanffy growth function to age-length data of the studied species. *Chelidonichthys cuculus*: continuous lines; *Trigloporus lastoviza*: dashed lines; *Serranus cabrilla*: dotted lines; *Trachinus draco*: dash-dotted lines.

Table S1. Summary of the main biological parameters for each species. MED: Mediterranean, AT: Atlantic; TL range: total length range of the individuals studied; Age range: age range of the individuals studied; M: males, F: females, and T: both sexes.

Species	Study Area	TL range (cm)	Age range (years)			L_{∞}			k			L_{50}			Reference
			T	F	M	T	F	M	T	F	M	T	F	M	
<i>C. cuculus</i>	Aegean Sea (MED)			28	20		0.22	0.51						Papaconstantinou, 1983	
	Mediterranean									19				Bauchot, 1987	
	Gulf of Lion (MED)	10-30	1-5	35		0.28								Campillo, 1992	
	Adriatic Sea (MED)	10-36	1-5	29	29		0.40	0.41						Marsan <i>et al.</i> , 1998	
	Tyrrhenian Sea (MED)	7-27	1-3	24	23		0.74	0.59				18		Colloca <i>et al.</i> , 2003	
	Adriatic Sea (MED)	10-26										17	15	Vallisneri <i>et al.</i> , 2012	
	Douarnenez Bay (AT)	14-45	1-21		42	37		0.46	0.52			28	27	Baron, 1985a; 1985b	
	English Channel (AT)	9-43	1-4	36	41	36	0.24	0.23	25					Dorel, 1986; ICES, 2006	
	Irish Sea (AT)	10-43	1-7	42	41	41	0.21	0.24	0.21	28		28	26	Marriott <i>et al.</i> , 2010	
	Gulf of Lion (MED)												19 < L_{50} < 21	Kartas, 1971	
<i>T. lastoviza</i>	Greek waters (MED)											14		Papaconstantinou, 1986	
	Egypt (MED)									14		15		Abdallah & Faltas, 1998	
	Gulf of Gabès (MED)											15		Boudaya, 2000	
	Gulf of Tunis (MED)	11-26								16	16	16		Ben Jrad <i>et al.</i> , 2010	
	Gulf of Gabès (MED)				33	30		0.13	0.13					Boudaya <i>et al.</i> , 2010	
	Douarnenez Bay (AT)												29	Baron, 1985	
	Tunis (MED)									10 (SL)				Bouain, 1981	
	Mediterranean									15 (SL)				Bauchot, 1987	
	Aegean Sea (MED)				26	30		0.30							Papaconstantinou <i>et al.</i> , 1994
	Greek waters (MED)		1-8	24		0.30									Politou & Papaconstantinou, 1995
<i>S. cabrilla</i>	Cretan Shelf (MED)	6-20	1-5	22		0.39								Tserpes & Tsimenides, 2001	
	Edremit Bay (MED)	9-22	1-4	34		0.11				15 (FL)				Torku-Koc <i>et al.</i> , 2004	
	Aegean Sea (MED)	7-23	1-6	24		0.30				13				İlhan <i>et al.</i> , 2010	
	Canary Islands (AT)									15 (SL)				García-Díaz <i>et al.</i> , 1997	
	Aegean Sea (MED)	15-37									16	15		Kınacıgil <i>et al.</i> , 2008	
	Black Sea (MED)	9-26	1-6	29	33	29	0.28	0.18	0.17					Ak & Genç, 2013	
	Kattagat (AT)	9-40	1-14	38	35		0.15	0.16						Bagge, 2004	

References in Table S1

- Abdallah, M., Faltas, S.N., 1998. Reproductive biology of *Trigla lucerna* and *Trigloporus lastoviza* in the Egyptian Mediterranean water. *Bulletin of the National Institute of Oceanography and Fisheries*, 24, 285-303.
- Ak, O., Genç Y., 2013. Growth and reproduction of the greater weever (*Trachinus draco* L., 1758) along the eastern coast of the Black Sea. *Journal of the Black Sea/Mediterranean Environment*, 19, 95-110.
- Bagge, O., 2004. The biology of the greater weever (*Trachinus draco*) in the commercial fishery of the Kattegat. *ICES Journal of Marine Science*, 61, 933-943.
- Baron, J., 1985a. The Triglidae (Teleostei, Scorpaeniformes) of the Bay of Douarnenez. The growth of *E. gurnardus*, *T. lucerna*, *T. lastoviza* & *A. cuculus*. *Cybium*, 9, 127-144.
- Baron, J., 1985b. The Triglidae (Teleostei, Scorpaeniformes) of the Bay of Douarnenez. The reproduction of *E. gurnardus*, *T. lucerna*, *T. lastoviza* & *A. cuculus*. *Cybium*, 9, 252-281.
- Bauchot, M.L., 1987. Serranidae. P. 1317-1319. In: *Fiches FAO d'Identification des Espèces pour les Besoins de la Pêche Méditerranée et Mer Noire, Zone de Pêche 37 (Rev.1), Vol II, Vertébrés*. Fischer, W., Scheneider, M., Bauchot, M.L. (Eds.). FAO, Rome.
- Ben Jrad, L., Fehri-Bedoui, R., Ben Slama, S., Ben Hassine, O.K., 2010. Reproduction et régime alimentaire de *Trigloporus lastoviza* (Triglidae) dans le golfe de Tunis (Méditerranée occidentale). *Cybium*, 34, 353-365.
- Bouain, A., 1981. Les serrans (Téléostéens, Serranidés) des côtes sud de la Tunisie. Taille de première maturité, période de reproduction. *Cybium*, 4, 65-75.
- Boudaya, L., 2000. *Écobiologie de deux espèces de Triglidae (Pisces, Teleostei) du golfe de Gabès: Trigloporus lastoviza (Bonnaterre, 1788) et Aspitrigna obscura (Linnaeus, 1764)*. Mémoire de DEA. Université du Sud, Tunisie, 137pp.
- Campillo, A., 1992. *Les pêcheries françaises de Méditerranée: synthèse des connaissances*. Institut Français de Recherche pour L'exploitation de la Mer, France, 206 pp.
- Dorel, D., 1986. *Poissons de L' Atlantique nord est relations taille-poids*. Institut Français de Recherche pour L' exploitation de la Mer, France, 165 pp.
- García-Díaz, M.M., Tuset, V.M., González, J.A., Socorro, J., 1997. Sex and reproductive aspects in *Serranus cabrilla* (Osteichthyes: Serranidae): Macroscopic and histological approaches. *Marine Biology*, 127, 379-386.
- ICES, 2006. *Report of the working group on the assessment of new MOU species (WGNEW)*. ICES Headquarters, ICES Advisory Committee on Fisheries Management, CM2006 /ACFM: 11, 234 pp.
- Kartas F., 1971. *Les Triglidae de la mer Catalane, distribution, croissance et reproduction: genres Lepidotrigla, Trigloporus lastoviza, Eutrigla gurnardus*. MSc Thesis. University of Paris, France 173 pp.
- Kinacgil, H.T., İlkyaz, A.T., Metin, G., Ulaş, A., Soykan, O. et al., 2008. *Determining the first reproduction length, age and growth parameters of Aegean Sea demersal fish for the regulation of fisheries management*. Tübitak-Çaydag, 327 pp.
- Marriott, A.L., Latchford, J.W., McCarthy, I.D., 2010. Population biology of the red gurnard (*Aspitrigna cuculus* L.; Triglidae) in the inshore waters of Eastern Anglesey and North-west Wales. *Journal of Applied Ichthyology*, 26, 504-512.
- Marsan, R., Ungaro, N., Marzano, M.C., Martino, M., 1998. Growth of *Aspitrigna cuculus* (Osteichthyes, Triglidae) in the south-western Adriatic area: preliminary results. *Biologia Marina Mediterranea*, 5, 694-696. (in Italian).
- Papaconstantinou, C., 1983. Aspects of the biology of *Aspitrigna cuculus* (L., 1758) (Pisces, Scorpaeniformes) in the Gulf of Saronikos. *Thalassographica*, 6, 49-75.
- Papaconstantinou, C., 1986. The life history of rock gurnard (*Trigloporus lastoviza*, Brünn., 1768) in the Saronikos Gulf. *Journal of Applied Ichthyology*, 2, 75-86.
- Papaconstantinou, C., Politou, C.-Y., Caragitsou, E., Stergiou, K.I., Mytilineou, E. et al., 1994. *Investigations on the abundance and distribution of demersal stocks of primary importance in the Thermaikos Gulf and the Thracian Sea (Hellas)*. National Centre for Marine Research, Technical Report, North Aegean Sea Series 4/1994.
- Politou, C.-Y., Papaconstantinou, C., 1995. Age and growth of comber, *Serranus cabrilla* (L., 1785) in the Thracian Sea and the Thermaikos Gulf (Northern Greece). *Rapport de la Commission Internationale pour l'Exploration Scientifique de la Mer Méditerranée*, 34.
- Tserpes, G., Tsimenides, N., 2001. Age, growth and mortality of *Serranus cabrilla* (Linnaeus, 1758) on the Cretan shelf. *Fisheries Research*, 51, 27-34.
- Vallisneri, M., Montanini, S., Stagioni M., 2012. Size at maturity of triglid fishes in the Adriatic Sea, northeastern Mediterranean. *Journal of Applied Ichthyology*, 28, 123-125.