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New Fisheries-related data from the Mediterranean Sea (April 2014)

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Supplementary Data

Collective article B

New Fisheries-related data from the Mediterranean Sea (April, 2014)
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Mediterranean Marine Science, 15 (1), 213-214.

3. Natural diet of common carp (Cyprinus carpio L., 1758) in Anatolia (Turkey): a review

By L. Vilizzi, F.G. Ekmekçi and A.S. Tarkan

Online Supplement 1

Statistical analysis

Differences between waterbody types (i.e. man-made reservoirs and natural lakes) in the diet composition of common carp were analysed using permutational multivariate analysis of variance (PERMANOVA). The Bray-Curtis dissimilarity index was applied on presence-absence data in order to produce a distance matrix and differences between waterbody types were tested based on a single-factor experimental design (9999 permutations of the raw data; $\alpha = 0.05$). Non-metric multi-dimensional scaling (NMDS) was used as an ordination method, and a dendrogram plot also was generated through cluster analysis (group average). Statistical analyses were carried out in PERMANOVA+ for PRIMER v6 (Anderson *et al.*, 2008).

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Online Supplement 2

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Table S1. Food items making up common carp natural diet in waterbodies of Anatolia. Taxonomy after http://www.itis.gov (accessed 08/01/2014).

	Man-made reservoirs							Natural lakes														
	Gelingüllü Reservoir	Gelingüllü Reservoir	Hirfanlı Reservoir	Hirfanlı Reservoir	Hirfanlı Reservoir	Keban Reservoir	Lake Akşehir	Lake Akşehir	Bafra Balık Lakes	Lake Beyşehir	Lake Eğirdir	Lake Gölköy	Lake İznik	Lake Kuş (Manyas)	Lake Marmara	Lake Mogan	Lake Mogan	Lake Nazik	Lake Sapanca	Lake Süleyman	Lake Uluabat (Apolyont)
	(1a)	(1b)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(6)	(6)	(9)	(6)	(6)	(6)	(10)	(11)	(12)	(6)	(6)	(6)
Phytoplankton																					
Bacillariophyta																					
Achnanthes				√	√	√															
Amphipleura					√																
Amphiprora				√																	
Amphora			√	√		√			√												
Caloneis			√	√																	
Cocconeis	√	√	√	√		√			√												
Craticula												√									
Cyclotella	√	√	√	√	√	√			√								√				
Cymatopleura	√	√	√	√					√												
Cymbella	√		√		√	√			√			√					√				
Denticula			√																		
Diatoma	√	√	√	√	√	√			√												
Diploneis	√	√																			
Epithemia				√													√				
Fragilaria	√	√		√	√	√															
Gomphonema			√	√	√	√			√												
Gyrosigma	√	√	√	√		√			√			√									
Hantzschia			√																		
Licmophora					√																
Melosira	√	√	√	√	√				√								√				
Navicula	√	√	√	√	√	√			√			√					√				
Nitzschia	√	√	√	√	√	√			√								√				
Pinnularia				√	√				√												
Rhoicosphenia			√	√		√			√												
Rhopalodia				√																	
Stauroneis						√															
Surirella	√	√	√	√	√	√			√												
Synedra	√	√	√	√	√	√			√								√				
Tabellaria												√									
Tetracyclus									√												
Undefined								√								√					
Charophyta																					
Closterium					√				√												
Cosmarium			√	√		√			√			√					√				
Euastrum									√												
Mougeotia				√																	
Nitella									√												
Spirogyra		√		√	√				√			√					√				

(continued)

Table S1 (continued)

	Man-made reservoirs								Natural lakes													
	Gelingüllü Reservoir	Gelingüllü Reservoir	Hirfanlı Reservoir	Hirfanlı Reservoir	Hirfanlı Reservoir	Keban Reservoir	Lake Akşehir	Lake Akşehir	Bafra Balık Lakes	Lake Beyşehir	Lake Eğirdir	Lake Gölköy	Lake İznik	Lake Kuş (Manyas)	Lake Marmara	Lake Mogan	Lake Mogan	Lake Nazik	Lake Sapanca	Lake Süleyman	Lake Uluabat (Apolyont)
	(1a)	(1b)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(6)	(6)	(9)	(6)	(6)	(6)	(10)	(11)	(12)	(6)	(6)	(6)
Staurastrum				√					√								√				
Zygnema	√	√		√	√							√									
Chlorophyta																					
Actidesmium					√																
Ankistrodesmus				√	√	√			√			√									
Cladophora						√															
Coelastrum	√	√	√																		
Keratococcus						√															
Kirchneriella				√													√				
Monoraphidium									√												
Oedogonium									√												
Oocystis			√	√	√												√				
Pandorina									√												
Pediastrum	√	√	√	√	√				√			√									
Scenedesmus		√	√	√	√				√			√					√				
Stigeoclonium				√																	
Tetraedron				√		√															
Ulothrix	√	√																			
Undefined								√													
Cyanophycota																					
Anabaena				√	√	√			√			√									
Aphanizomenon					√																
Chroococcus				√	√	√															
Gloeotrichia			√			√															
Lyngbya			√	√		√															
Merismopedia				√	√	√			√			√									
Microcystis				√	√				√			√					√				
Nostoc				√		√															
Oscillatoria	√	√	√	√	√	√			√			√					√				
Schizothrix						√															
Spirulina				√		√															
Symploca						√															
Euglenophycota																					
Euglena	√	√	√	√	√				√			√					√				
Phacus			√	√																	
Pyrrhyphycota																					
Ceratium				√																	
Peridinium				√	√				√												
Rhodophyta																					
Lemanea		√																			
Xanthophyta																					
Vaucheria									√												
Zooplankton																					
Cladocera																					
Alona	√	√	√	√	√							√					√				
Bosmina	√	√	√				√			√	√	√	√	√	√					√	√
Ceriodaphnia			√		√	√											√				
Chydorus	√	√			√												√				
Daphnia	√	√	√	√	√	√			√			√	√	√	√		√	√		√	√
Diaphanosoma			√		√												√				
Leydigia				√																	

(continued)

Table S1 (continued)

	Man-made reservoirs							Natural lakes													
	Gelingüllü Reservoir	Gelingüllü Reservoir	Hirfanlı Reservoir	Hirfanlı Reservoir	Hirfanlı Reservoir	Keban Reservoir	Lake Akşehir	Lake Akşehir	Bafra Balık Lakes	Lake Beyşehir	Lake Eğirdir	Lake Gölköy	Lake İznik	Lake Kuş (Manyas)	Lake Marmara	Lake Mogan	Lake Mogan	Lake Nazik	Lake Sapanca	Lake Süleyman	Lake Uluabat (Apolyont)
	(1a)	(1b)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(6)	(6)	(9)	(6)	(6)	(6)	(10)	(11)	(12)	(6)	(6)	(6)
Macrothrix	√	√																			
Pleuroxus				√																	
Undefined																√					
Copepoda																					
Canthocamptus	√	√																			
Cyclops	√	√	√	√	√	√					√	√		√	√		√		√	√	√
Diaptomus			√	√	√							√					√				
Undefined											√		√	√		√			√	√	√
Malacostraca																					
Astacus												√									
Gammarus									√			√									
Mysis												√									
Ostracoda																					
Cypridopsis												√									
Cypris			√	√	√							√					√				
Undefined	√	√									√				√	√				√	√
Rotifera																					
Ascomorpha						√															
Asplanchna																	√				
Bdelloidea	√																				
Brachionus						√															
Cephalodella						√															
Filinia					√	√															
Hexarthra					√	√											√				
Keratella	√	√		√	√	√			√								√				
Lecane	√	√		√		√															
Polyarthra						√															
Synchaeta						√															
Triarthra				√													√				
Undefined																√		√		√	
Benthic invertebrates																					
Diptera																					
Chironomus			√	√	√							√					√	√			
Eucorethra				√	√												√				
Undefined	√	√	√				√		√		√		√	√	√	√			√	√	√
Gastropoda																					
Gyraulus												√									
Physa												√									
Undefined				√	√					√	√								√	√	
Nematoda		√							√												
Oligochaeta				√	√												√	√			
Coleoptera																					
Chaetophora									√												
Detritus					√							√				√					
Plant material	√				√		√					√				√	√		√	√	
Fish																					
Eggs	√	√		√										√	√				√	√	√
Parts	√	√						√	√												

[1a] Kırankaya (2007) (Mirror carp); [1b] Kırankaya (2007) (Scale carp); [2] Karaca (1995); [3] Gürbüz (2004); [4] Gül *et al.* (2010); [5] Pala *et al.* (2003); [6] Numann (1958); [7] Çetinkaya (1992); [8] Yılmaz *et al.* (2003); [9] Turker (2006–2007); [10] Tanyolaç and Karabatak (1974); [11] Atasagun (1991) (same as Atasagun & Karabatak, 1995); [12] Şen (2001).

5. Reproductive biology of common carp (Cyprinus carpio L., 1758) in Anatolia (Turkey): a review

By L. Vilizzi, A.S. Tarkan and F.G. Ekmekçi

Online Supplement 3

Statistical analyses

Differences in mean age at maturity, spawning period duration, absolute fecundity, relative fecundity and egg diameter with waterbody types (man-made reservoirs and natural lakes; Sakarya River was not included since it was the only watercourse in the dataset) were analysed using permutational univariate analysis of variance (PERMANOVA). Following data normalisation, the Euclidean distance was used to produce a distance matrix and differences between waterbody types were tested based on a single-factor experimental design (9999 permutations of the raw data; $\alpha = 0.05$). Statistical analyses were carried out in PERMANOVA+ for PRIMER v6 (Anderson *et al.*, 2008). Briefly, the advantage of PERMANOVA over traditional parametric analysis of variance is that the stringent assumptions of normality and homoscedasticity in the data, which are very often unrealistic when dealing with ecological datasets, are considerably relaxed (Anderson, 2001).

Trends in monthly GSI data were analysed using Dynamic Factor Analysis (DFA) after centering of the data and using a diagonal matrix. DFA is a multivariate technique estimating underlying common trends in multiple time series (Zuur *et al.*, 2003). DFA was applied using Brodgar 2.5.7 (http://www.brodgar.com).

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Online Supplement 4

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