



Technical contribution

Length–weight relationships for nine species of batoids from the Iskenderun Bay, Turkey

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Summary

Presented are length–weight relationships for *Rhinobatos rhinobatos*, *Rhinobatos cemiculus*, *Gymnura altavela*, *Dasyatis pastinaca*, *Rhinoptera marginata*, *Pteromylaeus bovinus*, *Torpedo nobiliana*, *Raja miraletus* and *Raja clavata* captured by gillnet, longline and bottom trawl fishing between May 2010 and July 2011 off the east coast of Iskenderun Bay, Turkey.

Introduction

Elasmobranch populations inhabiting the eastern Mediterranean Sea are declining due to both direct and indirect fishing pressure from commercial fisheries (Başusta et al., 2012). Unfortunately, biological information pertaining to cartilaginous fishes within this region is extremely limited (Başusta et al., 2008; TFS (Turkstat, Fishery Statistics, 2009). Here we report LWRs for nine skate and ray species from the eastern Mediterranean Sea.

(36°37'83"E, 35°38'52"N; 36°33'71"E, 35°34'87"N; 36°33'36"E, 35°34'154"N; 36°30'946"E, 35°21'385"N) between May 2010 and July 2011. After capture, specimens were identified (Golani et al., 2006), refrigerated and transported to Firat University where they were immediately frozen for later analyses. Total length (TL) and weight for skates and disc width (DW) and weight measurements for rays were made to the nearest 0.1 cm, and gram, respectively.

Initially, length and weight data for all specimens were log transformed and the resulting data then applied to a linear regression; data with a studentized residual greater than 2 were considered outliers and removed from the data set. The slope and intercept values were then compared for males and females on a species-specific basis using ANCOVA. When there were significant differences in the length–weight relationship between males and females of a given species, sex-specific LWR analyses were performed; when no significant difference was observed, the data were treated in aggregate.

Material and methods

Specimens were collected by commercial gill net, longline and bottom trawl onboard 'F/V Coskun Reis' in Iskenderun Bay

Results and discussion

A total of 1031 individuals from four elasmobranch families were collected during the study (Table 1). Since significant

Table 1.
Length–weight relationships for nine species of batoids, Iskenderun Bay, Turkey

Species	Sex	n	Size range (cm)	Weight range (g)	LWR	r ²
<i>Rhinobatos rhinobatos</i>	M	11	35–125 TL	70–5000	WT = $0.0011 \times L^{3.1863}$	0.96
	F	9				
<i>Rhinobatos cemiculus</i>	M	118	32–149 TL	88–1100	WT = $0.00265 \times L^{3.0199}$	0.86
	F	144				
<i>Gymnura altavela</i>	M	48	30–127 DW	250–15 800	WT = $0.017 \times L^{2.7948}$	0.73
	F	56				
<i>Dasyatis pastinaca</i>	M	195	15–64 DW	96–8660	WT = $0.0419 \times L^{3.3169}$	0.84
	F	222				
<i>Rhinoptera marginata</i>	M	5	13–92 DW	172–11 000	WT = $0.01 \times L^{2.1347}$	0.75
	F	12				
<i>Pteromylaeus bovinus</i>	M	12	32–86 DW	730–7864	WT = $0.0194 \times L^{2.9034}$	0.90
	F	10				
<i>Torpedo nobiliana</i>	M	64	12–35 TL	18–850	WT = $0.015 \times L^{3.0611}$	0.85
	F	28				
<i>Raja clavata</i>	M	37	25–70 DW	145–2260	WT = $0.023 \times L^{2.6421}$	0.76
	F	38				
<i>Raja miraletus</i>	M	11	24–54 DW	58–998	WT = $0.0021 \times L^{3.262}$	0.95
	F	11				

TL, total length; DW, disc width.

differences ($P < 0.05$) were only found between male and female *Raja clavata*, the sexes were combined for all other species-specific length–weight analyses. As fisheries related information within this region is extremely limited and harvests of these species are unregulated (Başusta et al., 2008; Çek et al., 2009; TFS (Turkstat, Fishery Statistics, 2009; Ceyhan et al., 2010; Başusta and Sulikowski, 2012), the information herein offers the ability to derive reliable weight estimates for batoids collected in Iskenderun Bay that are measured but not weighed.

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