Short Communication

Length-weight relationships for 18 less-studied fish species

By R. Froese

FishBase Project, ICLARM, MCPO Box 2631, Makati City 0718, Philippines

Summary

Length-weight relationships for the mostly tropical species *Alepocephalus bairdii, Aulostomus chinensis, Centropyge fisheri, Dascyllus trimaculatus, Dissostichus eleginoides, Glossogobius giuris, Gobionotothen acuta, Gymnothorax flai'imarginatus, Kyphosus bigibbus, Notoscopelus elongatus, Parupeneus bifasciatus, Pseudanthias squamipinnis, Pseudocheilinus evanidus, Pungitius pungitius, Scarus dubius, Sebastes marinus, Thalassoma duperrey* and *Zebrasoma flavescens* are presented.

Introduction

The length weight relationships of fish are important for converting length observations, obtained for example from underwater visual census methods, into weight estimates for, for example, biomass estimates. Such relationships, while easily obtained, are still unavailable for many fish species. The present study presents estimates of the length weight relationships for 18 species of the families Acanthuridae, Alepocephalidae, Aulostomiidae, Gasterosteidae, Gobiidae, Kyphosidae, Labridae, Muraenidae, Mullidae, Myctophidae, Nototheniidae, Pomacanthidae, Pomacentridae, Scaridae, Scorpaenidae and Serranidae.

Materials and methods

Length and weight measurements were obtained from a data set originally assembled for estimating the sizes of fish brains (Bauchot et al. 1979; Bauchot and Bauchot 1986; Bauchot et al. 1989), as contained in FishBase 97 (Froese and Pauly 1997). Only species for which no length-weight relationship was available in FishBase 97, the largest existing compilation of such parameters (Binohlan and Pauly 1997), were considered for this study. For a species to be selected it had to have at least three measurements available, covering a length range of at least a quarter of the maximum length measured. The least square regression analysis available in the MS Excel spreadsheet software was used to calculate the parameters of the equation [log W = log a + log L * b], where W is the bodyweight in g and L is the length in cm. measured either as total length (TL) or standard length (SL).

Results and discussion

The parameters of the length-weight relationships for the selected species are given in Table 1, together with the regression coefficient (r), the number of specimens measured (n), the size of the smallest (min) and largest (max) specimen measured, and the type of length measurement used (SL or TL). Despite the small number of specimens (3–11) and the sometimes narrow length range, the values for the exponent (b) remain mostly within the expected range of 2.5-3.5 and the parameters can be used safely within the indicated length range. Extrapolations outside that range may, however, be erroneous.

References

Bauchot, M. L.; Bauchot, R., 1986: Encephalization in tropical teleost fishes and its correlation with their locomotory habits. In: Indo-Pacific fish biology: Proceedings of the Second International Conference on Indo-Pacific Fishes. Eds: T. Uyeno, R. Arai, T. Taniuchi and K. Matsuura. Ichthyological Society of Japan, Tokyo, Japan, pp. 678-690.

Bauchot, R.; Diagne, M.; Ridet. J. M., 1979: Post-hatching growth and allometry of the teleost brain. J. Hirnforsch. 20, 29-34.

Bauchot. R.; Ridet, J.M.; Bauchot, M.-L., 1989: The brain organization of butterflyfishes. Environ. Biol. Fish. 25(1/3), 205-219.

Binohlan. C.; Pauly. D., 1997: The length-weight table. In: FishBase 97: concepts, design and data sources. Eds: R. Froese and D. Pauly, ICLARM. Manila, Philippines, pp. 99-101.

Froese, R.; Pauly. D. (Eds):, 1997: FishBase 97: concepts, design and data sources. ICLARM. Manila. Philippines. 256 pp.

Author's address: R. Froese. FishBase Project, ICLARM, MCPO Box 2631. Makati City 0718. Philippines

Table 1
Parameters of the length-weight relationship for 18 species

Name	a	b	r	n	Min (cm)	Max (cm)	Type*
A lepocephalus bairdii	0.002824	3.21	0.9991	5	12.0	75.0	TL
Alepocephalus bairdii	0.003512	3.23	0.9983	5	11.0	66.0	SL
Aulostomus chinensis	0.000862	3.16	0.9919	4	33.0	69.0	TL
A ulostomus chinensis	0.001075	3.16	0.9939	4	31.1	65.0	SL
Centropyge fisheri	0.054508	2.59	0.9986	3	6.2	8.4	TL
Centropyge fisheri	0.114338	2.42	0.9986	3	5.2	7.2	SL
Dascyllus trimaculatus	0.108211	2.75	0.9783	3	8.2	11.4	SL
Dissostichus eleginoides	0.005897	3.24	0.9993	5	17.7	89.0	SL
Glossogobius giuris	0.012261	2.90	0.9989	3	2.6	5.9	TL
Gobionotothen acuta	0.004452	3.35	0.9881	4	17.0	24.2	SL
Gymnothorax flavimarginatus	0.000403	3.35	0.9993	3	22.5	88.5	TL
Kyphosus bigibbus	0.025733	3.04	0.9992	3	15.2	36.5	SL
Kyphosus bigibbus	0.027532	2.86	0.9984	3	17.7	45.0	TL
Notoscopelus elongatus	0.000308	4.52	0.9659	6	10.2	14.2	SL
Parupeneus bifascialus	0.003234	3.48	0.9997	3	10.5	27.5	TL
Parupeneus bifascialus	0.007976	3.38	0.9994	3	8.6	23.0	SL
Pseudanthias squamipinnis	0.056858	2.65	0.9999	3	3.7	9.0	SL
Pseudocheilinus evanidus	0.004883	3.51	0.9978	3	4.4	7.0	TL
Pseudocheilinus evanidus	0.016102	3.20	0.9965	3	3.5	5.8	SL
Pungitius pungitius	0.007513	2.98	0.9765	4	3.1	4.6	TL
Pungilius pungitius	0.012542	2.89	0.9657	4	2.7	4.0	SL
Scams dubius	0.002117	3.75	1.0000	3	16.5	26.0	TL
Scams dubius	0.006650	3.50	0.9998	3	14.5	23.5	SL
Sebastes marinus	0.007096	3.18	0.9982	11	10.2	50.0	TL
Sebastes marinus	0.011541	3.16	0.9989	11	8.7	43.0	SL
Thalassoma duperrey	0.014843	3.16	0.9903	3	11.5	18.7	SL
Thalassoma duperrey	0.015516	2.89	0.9993	3	14.1	24.5	TL
Zebrasoma flavescens	0.043943	2.93	0.9816	4	10.0	15.6	SL
Zebrasoma flavesc ens	0.014796	3.16	0.9958	4	11.7	18.0	TL

*TL = total length, SL = standard length