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FIRST RECORD OF PALMETTO BASS (*MORONE SAXATILIS X M. CHRYSOPS*) IN THE CROATIAN PART OF THE RIVER DANUBE

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Abstract - On October 19, 2010, a male specimen of palmetto bass *(Morone saxatilis x M. chrysops) was* caught by commercial fishing net in the Croatian section of the river Danube (302 mm TL and 331 g). It was in its third year of age (2+). A condition factor of 1.20 was based on the total length. Six specimens of prey fish were found in its gut (22.97 g altogether). Morphometric and meristic traits of this palmetto bass are presented and its possible threat to the fish community is discussed.

Key words: Palmetto bass, Danube, Croatia, first record

INTRODUCTION

Palmetto bass is a significant hybrid of a striped bass (*Morone saxatilis*) female and a white bass (*M. chrysops*) male, originally cultured in the USA. It was introduced into Europe and northern Africa as an aquaculture fish (Nelson, 1994). Today, it is considered an excellent fish for the market, as well as an attractive game fish in Italy, Germany and Turkey (Roncarati et al., 2009). Several authors presupposed that eventually some specimens could have escaped into open waters (Güner et al., 2006; Innal and Erk'akan, 2006) (Kottelat and Freyhof, 2007). The aim of this paper was to present the first palmetto bass caught in the Croatian section of the river Danube.

MATERIALS AND METHODS

The specimen of palmetto bass (Fig. 1) was caught by commercial fishing net on October 19, 2010, in the river Danube, two nautical miles from the confluence of the river Drava (1398 km of the Danube in the territory of the Republic of Croatia), at a depth of approximately 3 m (Fig. 2).

The specimen was frozen and transferred to the laboratory. After defrosting, it was measured for morphometric traits to the nearest mm, while meristic traits were counted from the left side of the body. The scales for age determination were taken from under the tip of the pectoral fin and checked under a light microscope. The body was dissected in order to determine its sex and to investigate the gut content. Based on still identifiable food organisms, the anterior third of the gut was checked while different food items in the gut were identified up to the species level and stored in 4% formaldehyde.

The condition factor (CF) was calculated as:

$$CF = W \times L^{-3} \cdot 100$$

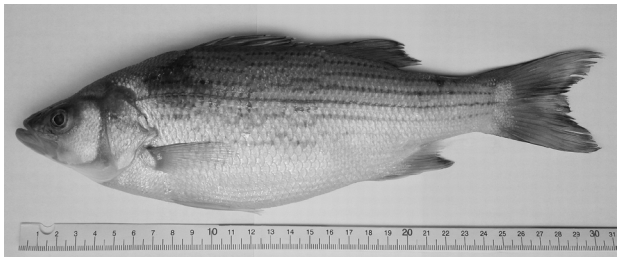

Fig. 1. Palmetto bass from Danube River (*Morone saxatilis* x *M. chrysops*)

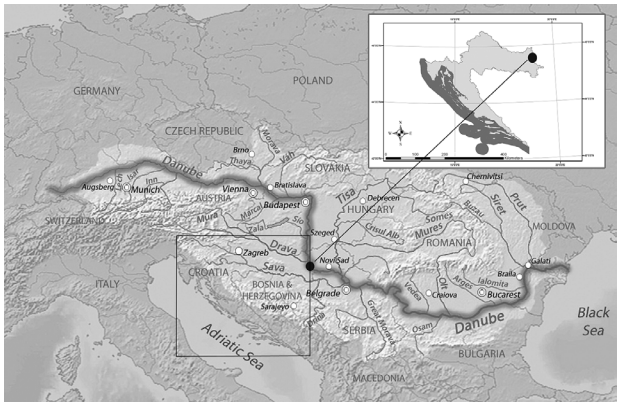

Fig. 2. Location of found specimen

where W = weight in grams and L = length in cm. In calculating CF both, total (TL) and standard (SL) lengths were used, in order to make the comparison with other results possible.

RESULTS AND DISCUSSION

The caught specimen of palmetto bass (302 mm TL and 331 g) appeared elongated, with horizontally extended dark lateral stripes, which were broken only in the area behind the pectoral fin and below the lateral line. This clearly distinguishes this hybrid from both the striped and the white bass. In the striped bass, the stripes are solid while in the white bass they are faint with the first stripe below the line and not distinct or complete towards the tail (Hubbs et al., 1991; Etnier and Starnes, 2001; Füllner, 2007). Scale annuli were distinct and easy to identify. Striped bass scales, on the contrary, are often irregularly laid down with uneven or ragged margins and the true annuli are hard to identify making age determination difficult (Bryce and Shelton, 1982). Furthermore, the number of rays in the second dorsal and pectoral fins were identical to those of the white bass, while tooth patches on the tongue, one sharp spin on the edge of each gill cover and the number of rays in the anal fin matched those of striped bass. These data coincide with the investigation of palmetto bass by (Kerby, 1979; Harrell and Dean, 1988). The morphometric and meristic values for the Danube specimen (Table 1) agree with the description of hybrid bass in the literature (Waldman, 1986; Harrell and Strand, 1995; Steiner, 2000; Froese and Pauly, 2010; Hodson,1999).

The condition factor (CF) of the specimen caught was 1.20 based on the total length and 2.11 based on the standard length. These values are higher than those of CF for both *M. saxatilis* and *M. chrysops* from open waters, counted from median records of L-W relationships from the FishBase (Froese and Pauly, 2010), which are 1.03 and 1.63, respectively. However, the CF based on the total length is lower than the one of 1.59 obtained for palmetto bass from a tank culture system (Jenkins et al., 1998). This could indicate that the investigated specimen at some point either escaped from an aquaculture facility or was even hatched in the wild. It belonged to the age group 2+. The achieved total length of 302 mm is close to that of wild *M. chrysops* but smaller than that of wild *M. saxatilis* of the same age (calculated by von Bertalanffy growth functions based on FishBase data) (Froese and Pauly, 2010). Gonad analysis showed that this was a male specimen. The gut content was filled with six fish specimens. One of them was a bream (*Abramis brama*), there were two bleak (*Alburnus alburnus*) and three of them were unrecognizable. The standard length of all eaten specimens varied between 4.0 and 6.4 cm. They altogether weighed 22.97 g. These data confirm that this palmetto bass was well adapted to living conditions in the Danube. However, although these hybrids are fertile they can produce only a few offspring (Kottelat and Freyhof, 2007). Therefore, one can assume that they are not a serious threat to the present fish community.

Table 1. Morphometric and meristic characters of palmetto bass *(Morone saxatilis x M. chrysops)* from the river Danube (302 mm TL and 331 g)

measures	mm	% of total length
fork length	278	92
standard length	250	82.8
head length	75	24.8
dorsal head length	31	10.3
head width	22	7.3
predorsal distance	143	47.3
prepectoral distance	65	21.5
prepelvic distance	78	25.8
preanal distance	174	57.6
length of dorsal fin	35	11.6
first dorsal fin base length	57	18.9
second dorsal fin base length	43	14.2
pectoral fin length	42	14.0
length of pelvic fin	46	15.4
length of anal fin	47	15.6
anal fin base length	32	10.5
caudal fin length	57	18.7
depth of caudal peduncle	16	5.3
length of caudal peduncle	54	17.8
	mm	% of head length
head height	33	44.0
eye diameter	12	16.0
snout length	22	29.3
post-orbital length	42	56.0
interorbital width	20	26.7
	number	-
spines in the first dorsal fin	9	-
soft rays in the second dorsal fin	14	-
spines in anal fin	3	-
soft rays in anal fin	11	-
spines in pectoral fin	2	-
soft rays in pectoral fin	14	-
soft rays in caudal fin	17	-
spines in ventral fin	1	-
soft rays in ventral fin	5	-
scales in lateral line	53	-
scales above lateral line	9	-
scales below lateral line	13	-

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REFERENCES

Bryce, T. D., and *W. L. Shelton* (1982). Dimorphic Growth Patterns on Scales of Striped Bass and *Morone* Hybrids from a Central Alabama River. *Proc. Annu. Conf. Southeast. Assoc. Fish and Wild. Agencies* **36**, 42-47

Etnier, D., and *W. Starnes* (2001). The Fishes of Tennessee.(2nd ed.) 389 – 396. The University of Tennessee Press. Knoxville, USA

Froese, R., and *D. Pauly* (Eds) (2010). FishBase 2010. http://www.fishbase.org, Accessed on: November, 2010.

Füllner, G., Gottschalk, T., and *Pfeifer, M.* (2007). Experiments for the production of hybrid striped bass in in-pond circulation systems. *Aquaculture Int.*, **15**, 241-248

Güner, Y., Özden, O., Kizak, V., Altunok, M., Toksen, E., and *A. Alpbaz* (2006). Culture applications of Hybrid striped bass (*Morone chrysops* x *Morone saxatilis*) I. Symposium of fish stocking and reservoir management, Antalya

Harrell, R. M., and *J. M. Dean* (1988). Identification of Juvenile Hybrids of Morone Based on Meristics and Morphometrics. *Transactions of American Fisheries Society*; **117,** 529-535

Harrell, R. G., and *I. E. Strand,* (1995). Differentiation of striped bass, *Morone saxatilis* (Walbaum), from a hybrid: effectiveness of training. *Fisheries Management and Ecology*, **2**, 53-60

Hodson, R. G. (1999). *Hybrid striped bass biology and life history. SRAC publication no. 300. Arkansas cooperative extension service fact sheet.* from - GAQF 5210 Advanced Aquaculture Course. *http://*www.uaex.edu/pperschbacher/Fish/Hybrid-striped-bass.htm*, Accessed on: November, 2010.*

Hubbs, C. Edwards, R. J., and *G. P. Garrett* (1991). An annotated checklist to the freshwater fishes of Texas, with keys to identification of species. *Texas Journal of Science*, Supplement **43**, 1-56

Innal, D., and *F. Erk'akan* (2006). Effects of exotic and translocated fish species in inland waters of Turkey. *Rev Fish Biol Fisheries* **16**, 39-50

Jenkins, W. E., Heyward, L. D. Sr., and *T. I. J. Smith* (1998). Performance of domesticated striped bass *Morone saxatilis*, palmetto bass and backcross hybrid striped bass (Sunshine Bass x Striped Bass) raised in a tank culture system. *Journal of the World Aquaculture Society*, **29**, 505-509

Kerby, J. H. (1979). Meristic Characters of two Hybrids. *Copeia*, **3**, 515-518

Kottelat, M., and *J. Freyhof* (2007). Handbook of European Freshwater Fishes. 520 – 521. Kottelat, Cornol, Switzerland and Freyhof, Berlin, Germany, 646 pp.

Nelson, J. S. (1994). Fishes of the World, 3rd edition. New York: John Wiley & Sons.

Roncarati, A., Dees, A., Pignata, S., Merluzzi, A., Sirri, F., Mordenti, O., Fortini, L., and *A. Felici* (2009). Comparisons of zootechnical performances, welfare condition and quality traits of hybrid striped bass (*Morone chrysops* X *Morone saxatilis*) reared in different Italian farms. *Ital. J. Anim. Sci.*, **8**, 872-874

Steiner, L. (2000). Pennsylvania Fishes. Pennsylvania Fish & Boat Commission, Harrisburg 170 pp.

Waldman, J. R. (1986). Diagnostic Value of Morone Dentition. Transection of the American Fisheries Society, **115**, 900-907