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B. Glamuzina, V. Bartulović: Some characteristics of the endemic dentex trout

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## SOME CHARACTERISTICS OF THE ENDEMIC DENTEX TROUT, *Salmo dentex* (Heckel, 1851) FROM THE NERETVA RIVER, BOSNIA–HERZEGOVINA

B. Glamuzina, V. Bartulović

### Summary

The paper confirms the presence of endemic dentex trout, *Salmo dentex* population in the Neretva River, Bosnia–Herzegovina. All catches were limited to main flow of the Neretva River close to town of Čapljina and colder areas of Hutovo Blato wetlands. All caught specimens of dentex trout fed on smaller fish. But, without preference to particular fish species.

Key words: dentex trout, *Salmo dentex*, Neretva River, Bosnia–Herzegovina

### INTRODUCTION

It is well known that western part of Adriatic–Mediterranean area possesses high degree of endemism of salmonid species (Benhke, 1973). At least, this area has most diverse phenotypic diversity among trout populations (Bernatchez, 2001). This great phenotypic diversity of local trout populations leads to recent scientific reports for total of 21 salmonid fish species and seventeen among them belong to genus *Salmo* (Teskeredžić et al., 1993; Kottelat, 1997). However, recent findings based on biochemical research pointed to conclusion that all of these seventeen belong to only one species, *Salmo trutta* (Apostolidis et al., 1996). The origin and distribution of salmonid species on Balkan Peninsula is recently discussed by Georgiev (2003), and he also accepted theory of »only one« trout species in the area.

However, the question of status of several *Salmo* species among above mentioned seventeen, still needs to be clarified. One of the most interesting and under investigated is dentex trout, *Salmo dentex* (Heckel, 1851). The

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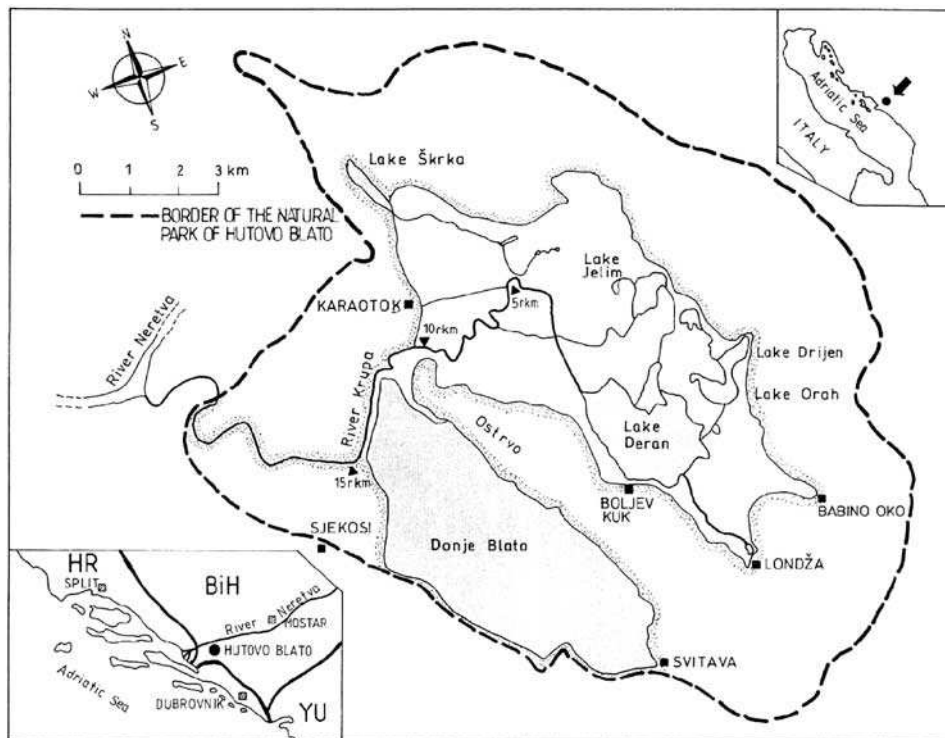


Fig. 1. Map of sampling sites  
Slika 1. Karta područja uzorkovanja

latest list of Northern Mediterranean endemic fish species (Crivelli, 1996) includes dentex trout under its old Heckel's name, *Salmo dentex*, with remark that its systematic status is not resolved yet. Also in the list of [www.fish-base.org](http://www.fish-base.org) the fish is cited as *Salmo dentex*. The recent genetic survey of Neretva salmonids describes it as distinct Neretva phylogeographic lineage of *Salmo trutta* (Razpet and Snoj, 2004).

Dentex trout is relatively unknown endemic trout (whether species or subspecies) of rivers entering south-eastern Adriatic coast. The reports about this species are very scarce, and are limited to original description of the species by Heckel (1851) and report of catch in the Neretva River (Čurčić, 1938). The species also lives in Montenegro rivers (Sorić, 1990). Mrakovcic et al. (1995) reported that dentex trout is extinct from Croatian rivers, Cetina and Krka. Some reports indicate its presence in the rivers of Livanjsko polje in Bosnia–Herzegovina (Vuković and Ivanović, 1971) and in river Aaos in Greece (Delling, 2003).

Intensive research of Neretva River in Bosnia–Herzegovina during last 40-years didn't give new results about species. In fact, the authors (Kosorić,

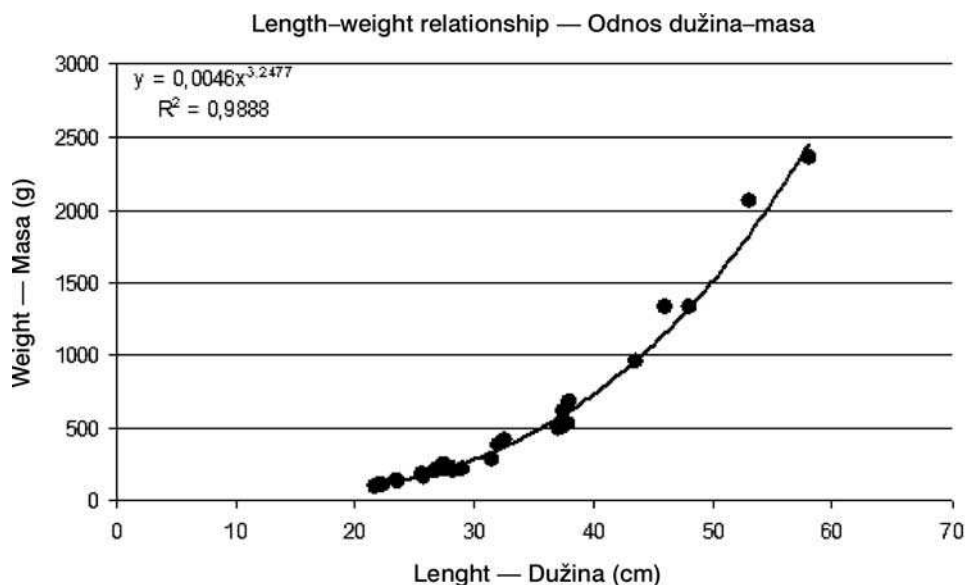


Fig. 2. Length–weight relationship of dentex trout, *Salmo dentex* from the Neretva River and Hutovo blato wetlands.

Slika 2. Duljinsko–težinski odnos zubatka, *Salmo dentex*, iz rijeke Neretve i močvara Hutova blata.

1978) only mentioned that species is very interesting, but did not record it. This means that during last 70 years, no presence of dentex trout was scientifically reported in Neretva River. In this paper results of new findings and description of some biological parameters of dentex trout are reported.

## MATERIAL AND METHODS

The fish were caught in the Neretva River and Hutovo blato wetlands in southern part of Bosnia–Herzegovina (Fig. 1). The samplings were performed by electro–fishing and drift–nets at irregular intervals from 2001–2004. During 2004 specimens fished out in the Neretva River were purchased from fishermen. Some data reported in this text were collected from sport fishermen and guards in the Park of Nature, but were not verified scientifically. Species identification was made according to Heckel (1851) description and Vuković and Ivanović (1971). The main characteristics for distinguishing dentex trout from relative species living in same river, mainly brown trout, *Salmo trutta* are small red and orange spots along the whole thin and elongated body.

Sampled fish were frozen or analyzed on site. Length and weight were measured using digital balance and calliper. Stomach of each specimen was



*Fig. 3. Dentex trout, Salmo dentex from the Neretva River and Hutovo blato wetlands streams.*

*Slika 3. Zubatak, Salmo dentex, iz rijeke Neretve i močvara Hutova blata.*

dissected and composition was analyzed under stereo-microscope. Water temperature was measured each time when dentex trout was caught.

### *RESULTS AND DISCUSSION*

During survey in the Neretva River and Hutovo blato wetlands we caught 30 specimens in total. We caught eight specimens by electro-fishing and eight with driftnets in Hutovo blato wetlands. In 2004 fourteenth new specimens fished out in the Neretva River were purchased from fishermen. The average weight of total sample was  $525.23 \pm 565.1047$  g, ranging from 95.9 g to 2360 g. Average total length was  $32.94 \pm 9.54$  cm ranging from 21.7 cm to 58.2 cm. The length-weight relationship is presented in Fig. 1, with power growth curve as best descriptor of growth characteristics.

All catches were limited to the main flow of the Neretva River close to town of Čapljina and colder areas of Hutovo Blato wetlands (Fig. 1). Park guards also reported catch of nine specimens (average weight around 1 kg)

by drift-net in Orah Lake. Sporadically, the smaller specimens were caught in traps for eel positioned in Krupa River by guardians, but these specimens were unavailable to researchers. Water temperature at sampling sites varied between 13.2°C and 14°C throughout the year.

All caught specimens of dentex trout fed on smaller fish. Fish from Škrka Lake fed on bleak, *Alburnus alburnus* juveniles ranged from 6–7 cm in length. Dentex trouts from streams (Londža and Jelinski streams) fed almost exclusively with native roach, *Rutilus basak* fingerlings, ranging from 6–9 cm. Middle length class fish (around 20–24 cm) fed on native roach fingerlings ranging 6–7 cm, while older dentex trout (500 grams) fed on bigger specimens, from 8–10 mm. The stomach content of 31.5 cm long dentex trout caught in lake Jelim was composed of two specimens of *Gasterosteus aculeatus* (3.2 and 3.2 cm) and two specimens of small rudd, *Scardinius scardafa* (6 and 8 cm in length). The diet is in strong relationship with the composition of ichthyofauna described earlier (Glamuzina and Conides, 2000), and is composed of dominant prey juvenile populations. But, seems that there is no preference to particular fish species.

These findings confirm existence of enigmatic »endemic dentex trout« in the Neretva River water complex and indicate need for more research on systematic status, biology and ecology, as well on artificial reproduction and rearing for stock enhancement and re-population.

### Sažetak

## NEKE ZNAČAJKE ZUBATKA, *Salmo dentex* (HECKEL, 1851), ENDEMIČNE PASTRVE IZ NERETVE U BOSNI I HERCEGOVINI

B. Glamuzina, V. Bartulović

U radu se potvrđuje postojanje populacije endemičnog zubatka, *Salmo dentex*, u rijeci Neretvi u Bosni i Hercegovini. Svi primjerci zubatka ulovljeni su u glavnom toku Neretve ispod grada Čapljine i u hladnijim vodama močvare Hutovo blato. Opisane su neke biološke značajke ulovljenih primjeraka. Svi su se ulovljeni primjerci hranili primjercima manjih riba, ali bez preferencije prema nekom posebnom plijenu.

Ključne riječi: zubatak, *Salmo dentex*, rijeka Neretva, Bosna i Hercegovina

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