

## REINTRODUCTION OF THE BURBOT TO THE HUNGARIAN AQUACULTURE (PRELIMINARY RESULTS)

ZOLTÁN BOKOR<sup>1\*</sup>, ISTVÁN ITTZÉS<sup>1</sup>, ZOLTÁN SZABÓ<sup>2</sup>, PÉTER PALOTÁS<sup>3</sup>,  
TAMÁS SZABÓ<sup>1</sup>, ÁDÁM STASZNY<sup>1</sup>, DANIEL ŻARSKI<sup>1</sup>, SŁAWOMIR KREJSZEFF<sup>4</sup>,  
BÉLA URBÁNYI<sup>1</sup>, KATARZYNA PALIŃSKA-ŻARSKA<sup>4</sup>

<sup>1</sup>*Department of Aquaculture, Szent István University, Gödöllő, Hungary*

<sup>2</sup>*Self entrepreneur, Nagykarácsony, Hungary*

<sup>3</sup>*Department. of Refrigeration and Livestocks' Products Technology,  
Corvinus University of Budapest, Hungary*

<sup>4</sup>*Department of Lake and River Fisheries, University of Warmia and Mazury, Olsztyn,  
Poland*

*Email: Bokor.Zoltan@mkk.szie.hu*

## PONOVO UVOĐENJE MANIĆA U AKVAKULTURU MAĐARSKE (PRELIMINARNI REZULTATI)

### *Apstrakt*

Manić (*Lota Lota*) je nativna vrsta ribe u Mađarskoj i poznato je da on živi skoro u svim našim rekama. Među pecarošima, ova vrsta je veoma popularna mada je retka kada je reč o ulovu. Dužina većih jedinki varira između 40 i 50 santimetara, retko dostiže dužinu od 60 santimetara, a državni rekord od 3,56 kg dostignut je 2001. godine (Harka and Sallai, 2007). Mađarska industrija za akvakulturu je zainteresovana za gajenje ove vrste već neko vreme, međutim uprkos činjenici da su neki strani istraživački timovi počeli da rade na istraživanju metoda za gajenje manića (Żarski et al., 2010; Trabelsi et al., 2011; Lahnsteiner et al., 2012;), ova vrsta nema detaljno razvijenu tehnologiju za reprodukciju i uzgoj. Prethodna istraživanja na nivou države (e.g. Keresztessy and Rideg, 2001) i povećane potrebe potrošača i pecaroša podstakli su nas da ponovo započnemo uzgoj i reprodukciju manića.

Nedavno su u Mađarsku dostavljene 2 populacije manića gajene u Poljskoj u RAS sistemu: 08.10.2014 dostavljeno je 1000 larvi prosečne težine 15g, a 15.12.2014 dostavljeno je 100 matica prosečne težine od 210g iz laboratorija Univerziteta Warmia i Mazury. Ribe su i u Mađarskoj uvedene u RAS sistem, na privatnom ribnjaku Zoltána Szabó. Larve su hranjene sa Scretting hranom za pastrmke (proteina: 42%, masti: 14%), na početku sa 140 g/

dnevno, a kasnije i do 13.04.2015 sa 280 g/dnevno. Do tog datuma, prosečna težina jedinki dostigla je 62 g, a ukupno 96 jedinki je uginulo (stopa preživljavanja: 90,4%).

Ista hrana, Scretting, korišćena je i za hranjenje matica za reprodukciju, međutim posle mesec dana, promenili smo je i počeli da koristimo Aquabio (proteina: 54%, masti: 17%). Do 13.04.2015 prosečna težina dostigla je 300 g, a stopa preživljavanja bila je 50% zbog bakterijske infekcije. Temperatura vode bila je konstantna: 14°C.

Da bi izvršili reprodukciju, stavili smo 40 ženki u tank od 700 l, u kome smo za jako kratak vremenski period snizili temperaturu na 2-2,5 °C. Uspeli smo da istisnemo ikru od 13 jedinki u tri različita dana (20.03, 24.03, i 26.03) sa stopom uspeha od PGSI: 11,75 %  $\pm$ 11,75; 24,43 %  $\pm$ 4,40; 12,92%  $\pm$ 3,62).

Osim tehnoloških eksperimenata za gajenje i reprodukciju, izvršili smo preliminarni ekperiment prerade ribe, u kome smo testirali sledeće parametre: težinu creva, jetre, glave, kičme i mesa, karakteristike ribljeg mesa, reakcije u toku pripreme u kuhinji i ukus nakon pripreme.

Rad je podržan projektom 8526-5/2014/TUDPOL Ministarstva Ljudskih Resursa Mađarske.

### *Abstract*

Burbot (*Lota Lota*) is a native species in Hungary and is known to live in most of our rivers. It is a popular but slightly rare catch among anglers. The length of the larger sized individuals varies between 40 and 50 centimeters, rarely reaches 60 cm, the national record is 3,56 kg from 2001 (Harka and Sallai, 2007). The Hungarian aquaculture industry is interested in rearing this species for a while, however in spite of some foreign research teams having started to work on investigating the rearing of burbot (Žarski et al., 2010; Trabelsi et al., 2011; Lahnsteiner et al., 2012;), this species does not have a developed and detailed reproduction and rearing technology. The previous national studies (e.g. Keresztessy and Rideg, 2001) and the increasing consumer and angler needs made us to begin the rearing and reproduction of burbot again.

Two Polish, RAS reared burbot population delivery arrived to Hungary lately: 1000 pcs larvae with 15 g average weight on 08.10.2014 and 100 pcs broodstock with 210 g average weight on 15.12.2014 from the laboratory of the Warmia and Mazury University. The fish were introduced to RAS system here as well, in the fish farm of Zoltán Szabó self-entrepreneur. Larvae were fed with Scretting trout feed (protein: 42%, fat: 14%), at the start in an amount of 140 g/day, later, until 13.04.2015 in an amount of 280 g/day. By this time, the average weight reached 62 g, and altogether 96 individuals died (survival rate: 90,4%)

For feeding the broodstock intended for reproduction, the feed was the same Scretting feed, and after one month, we have changed to Aquabio (protein: 54%, fat: 17%). By 13.04.2015 the average weight reached 300 g, survival rate is 50% due to a bacterial infection. The water temperature was constant 14°C.

For the purpose of reproduction, we have placed 40 females into a 700 l tank, where we have reduced the water temperature to 2-2,5 °C in a very short time. We could strip eggs from 13 individuals at 3 different dates (20.03, 24.03, and 26.03) and success rates (PGSI: 11,75 %  $\pm$ 11,75; 24,43 %  $\pm$ 4,40; 12,92%  $\pm$ 3,62).

In addition to the rearing and reproduction technology experiments, we have conducted a preliminary fish processing experiment as well, where we tested the following param-

ters: weight of intestines, liver, head, spine, and meat, the characteristics of the fish meat, reactions during kitchen preparation and taste after preparation.

The work was supported by the project number 8526-5/2014/TUDPOL of the Ministry of Human Resources of Hungary.

## REFERENCES

Ákos Harka, Zoltán Sallai (2004). *Magyarország Halfaunája*. 192.

Daniel Źarski, Dariusz Kucharczyk, Wojciech Sasinowski, Katarzyna Targońska, Andrzej Mamcarz (2010). The influence of temperature on successful reproductions of burbot *Lota Lota* (L.) under hatchery conditions, *Polish Journal of Natural Sciences*. Vol. 25(1): 93-105.

Lahnsteiner, F., M. Kletzl and T. Weismann (2012). The effect of temperature on embryonic and yolk-sac larval development in the burbot *Lota lota*. *Journal of Fish Biology* Vol 81(3) 977–986.

Katalin Keresztessy, Árpád Rideg (2001). Evaluating the endangeredness of burbot (*Lota lota* L. 1758) and its artificial propagation. *Hungarian Agricultural Research* Vol 4: 16-19.

Awatef Trabelsi, Jean-Noël Gardeur, Fabrice Teletchea, Pascal Fontaine (2011). Effects of 12 factors on burbot *Lota lota* (L., 1758) weaning performances using fractional factorial design experiment. *Aquaculture* 316. 104-110.