LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH TERINDEKS SCOPUS

Judul Karya Ilmiah/Artikel	:	Spatial distribution and heavy metal pollution analysis in the sediments of Garang watershed, Semarang, Central Java, Indonesia		
Jumlah Penulis	:	5 (lima)		
Status Pengusul		~~Penulis pertama~~/ penulis ke 4/ ~~penulis korespodensi**~~		
Penulis Karya Ilmiah	:	Haeruddin, Supriharyono, Arif Rahman, Abdul Ghofar, Sigit B.I.		
Identitas Karya Ilmiah	a.	Nama jurnal	:	AACL Bioflux, 2020
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	c.	Vol, No, Bln, Thn	:	2020, Volume 13, Issue 5
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		URL	:	http://www.bioflux.com.ro/docs/2020.2577-2587.pdf
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	g.	Terindeks di	:	SCOPUS, Q3 SJR: 0.28

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Spatial distribution and heavy metal pollution analysis in the sediments of garang watershed, Semarang, Central Java, Indonesia

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Abstract

Author keywords

SciVal Topics

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Abstract

Garang watershed is located in Central Java, Indonesia. Various activities around the Garang watershed cause river pollution, by producing heavy metal waste, which can accumulate in the sediment, being absorbed from the water by organisms. This study was conducted to determine the concentration of heavy metals in the sediments, map the spread in the Garang watershed (Banjir Kanal Barat River, Garang River, Kreo River), and to determine the state of sediment pollution with heavy metals. The sediment samples were collected from 7 stations, with 3 replicates for each station. Samples of sediment were analyzed with Atomic Absorption Spectrophotometry (AAS), then the concentration of metals was mapped according to the sampling location. The sediment pollution index was determined. The results showed that the metal concentrations in sediment varied, from concentrations below the detection limit to tens of thousands of ppb. Lead had the highest concentration, followed by Cr and Cu. Cd and Zn were under the detection limit. The highest lead concentrations were recorded in the Banjir Kanal Barat (BKB) River and the lowest in the Kreo River. The highest Cu concentrations were in the Garang River and the lowest in the Kreo River. The highest concentrations of Cr were in the BKB River and the lowest in the Kreo River. Pb and Cr have similar spatial distribution patterns and differ from the spatial spread of Cu. The sediment pollution index indicated that the sediments of Garang watershed, BKB River, Garang River, and Kreo River had not been contaminated with heavy metals. © 2020, BIOFLUX SRL. All rights reserved.

Author keywords

Banjir Kanal Barat; Garang; Kreo; River; Sediment pollution index

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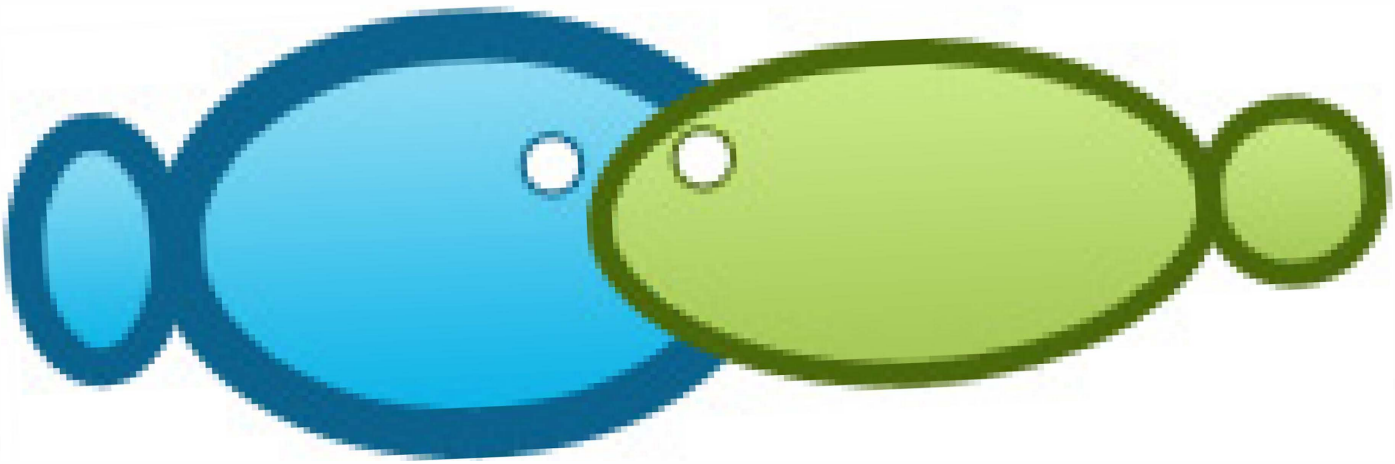

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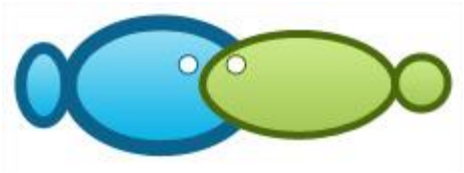

Biology of the endangered queen loach (*Botia dario)* collected from wild sources in Bangladesh

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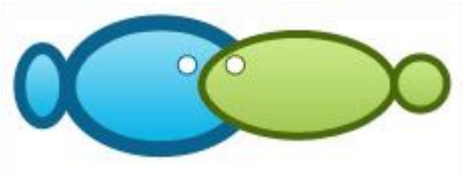
Abstract. The study was conducted with the aim of evaluating the food and feeding habit of *Botia dario*, collected from wild sources of north-eastern Bangladesh from January to June 2019, by calculating the: Gastrosomatic Index (GaSI), Relative Gut Length (RGL), Gonadosomatic Index (GSI) and Hepatosomatic Index (HSI). Food and feeding habit were evaluated based on the gut content analysis followed by the percent of numerical method and the frequency of occurrence method. Observation of feeding habit of *Botia dario* revealed that it is a carni-omnivorous and bottom feeder fish having a preference for animal materials (89.06%) over plant materials (2.67%). By percent of numerical method, the main contributors to their diet were worms (46.40%), followed by fish particles (28.80%), crustaceans (5.60%), insects (5.33%), detritus (3.20%), molluscs (2.40%), algae (1.87%), plant parts (0.80%) and water mites (0.53%). By frequency of occurrence method, worms and fish particles had a similar contribution (94.44%) to *B. dario* diet, followed by insects (66.67%), crustaceans (55.56%), algae (38.49%), detritus (33.33%), molluscs (22.22%), plant parts (16.67%) and water mites (11.11%). Average RGL value of *B. dario* was 1.08±0.16 which also demonstrates the carni-omnivorous nature of the species. Maximum GSI value was found in the month April (11.29±1.53), and HSI value was lowest in April for both female (1.69±0.77) and male (1.85±0.18). The highest GSI value and lowest HSI values in April indicate that it is the spawning period for this species, because the liver has a weight loss during reproduction which may imply the mobilization of the hepatic reserve for the maturation of gonads. Moreover, the lower RGL (0.98±0.03) and GaSI (0.91±0.56) values in April indirectly confirmed that April is the spawning period for *B. dario*. The findings might be useful as baseline information on the biological characteristics of *B. dario*.

Key Words: food and feeding habit, GaSI, GSI, HSI, carni-omnivorous, biological characteristics.

Introduction. *Botia dario* (Hamilton 1822), also known as Queen loach or Bengal loach or Necktie loach, has yellow golden stripes on a black background. The species is one of the most active loaches living in South East Asian countries including Bangladesh, India, Bhutan and Nepal (Siddiqui 2007). It is one of those few Small Indigenous Species (SIS) having both edible as well as ornamental values (Dey et al 2015). In Bangladesh, it is regarded mainly as a table fish due to its excellent flesh quality (Hussain et al 2007) with remarkably higher amount of fat and minerals content (calcium, phosphorus etc.), as compared with large freshwater fishes (Hossain et al 1999). A moderate demand for this species originates among the aquarium fish hobbyists due to its brilliant color pattern (Gupta & Banerjee 2012). *B. dario* also started being exported to different countries (Gupta & Banerjee 2014). Although this fish species was previously abundant in the rivers, streams and beels (seasonal low-lying floodplain) throughout Bangladesh, serious declines in its populations and abundances have been recently reported (Hossain et al 2015). It is inferred that the natural population of *B. dario* declined by about 60% over the last 20 years (IUCN 2015) due to a number of factors like: habitat loss resulting from the use of insecticides in paddy fields, siltation of upland rivers, lifting of stones and sands from river beds and construction of flood control dams, ecological changes, over exploitation, destruction of breeding ground and lack of proper management (IUCN 2015;



Impact of hormonal manipulation on egg quality of *Diplodus sargus*: comparative ultrastructural changes

Amal F. Fahmy, Zeinab A. El-Greisy, Samia G. Moharram

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Abstract. This study was carried out to examine the potential of using either gonadotropin-releasing hormone analog (GnRHa) or mixture of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) (Epigonal) to induce ovulation of white sea bream *Diplodus sargus* during the pre-spawning season. In addition, the effects of different hormonal injections on egg quality by using scanning and transmission microscopy were described. It investigates the differences in the oocyte size and ultrastructural changes of the oocytes surface and zona radiata (ZR) thickness between the two different hormonal therapies. Captured mature females with oocytes diameters > 680 µm were injected twice with two different hormonal protocols. The first group of females was injected intramuscularly with two doses of GnRHa (0.05 µg kg^{-1}) at 24 hrs interval; the second group were injected intramuscularly with two doses of Epigonal (75 IU) at 24 hrs interval. The results revealed that better induction of the egg ovulation with a significant positive correlation between zona radiata (ZR) thickness and oocyte diameters after 12 hrs from the first injection of Epigonal. On the other hand, after the same time of the first injection of GnRHa, the females possessed over-ripening eggs and a gradual onset of residual yolky oocytes. Interestingly, after the second injection of both protocols the oocytes deteriorated, lost their viability and were characterized by stretched egg surfaces with significant differences ($p < 0.05$) between pore diameters and distance between pores. ZR thickness and oocyte diameter showed a reciprocal relationship. This study concluded that the first injection of Epigonal is more effective to induce ovulation of *D. sargus* than GnRHa injection. It is essential to determine the stage of oocyte development, type and doses of hormone injection, the onset of ovulation and the best time for manual stripping to prevent over-ripening eggs in the ovarian cavity that affects egg quality.

Key Words: *Diplodus sargus*, induced ovulation, ultrastructure, over-ripening egg, zona radiata.

Introduction. White sea bream *Diplodus sargus* is one species of highly valued family (Sparidae) in the aquaculture industry of the world. This family is one of the most economically important marine fish families that inhabit the Egyptian coast; it is well represented by a diversity of species and as well both in total landings and high commercial value. Due to the economic importance of this species, it was made the subject of various scientists in different countries (Gonçalves & Erzini 2000; Vigliola & Harmelin 2001; Morato et al 2003; Pajuelo & Lorenzo 2004; Mahmoud et al 2010).

Hormonal manipulation is an important key factor for the sustainability of commercial aquaculture production of wild captive fish. Many different hormonal induction protocols are used efficiently to induce ovulation during artificial propagation of farmed fish species. Hormonal artificial manipulation of the endocrine system acts at different levels in the hypothalamic–pituitary–gonadal axis (Zohar & Mylonas 2001). Gonadotropins secretions have been controlled by gonadotropin-releasing hormone (GnRH) secreted from hypothalamic neurons and is responsible directly of synthesis and release of luteinizing hormone (LH) and follicle-stimulating hormone (FSH) from the pituitary (Gore 2002) and consequently a gonadal secretion of the sex steroids (Poortenaar & Pankhurst 2000). Gonadotropin-releasing hormone analog (GnRHa) injection is used for artificial induced ovulation to mimic the natural secretion of GnRH from the hypothalamus to release LH hormone from the pituitary gland (Pagelson & Zohar 1992). Levavi-Sivan et al (2004) reported that GnRHa injections used to induce ovulation of multiple-batch group-synchronous ovarian development. Hormonal induction