Biodiversity Journal, 2018, 9 (4): 425–428 DOI: 10.31396/Biodiv.Jour.2018.9.4.425.428

Fecundity and length-weight relationship of cyprinid fish, *Rasbora rubrodorsalis* Donoso-Büchner et Schmidt, 1997 (Pisces Cyprinidae) in the tributary of Sieo River, Roi Et Province, Northeast Thailand: a preliminary report

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ABSTRACT The present paper reports on fecundity and length-weight relationship of cyprinid fish, *Rasbora rubrodorsalis* Donoso-Büchner et Schmidt, 1997 (Pisces Cyprinidae) in the tributary of Sieo River, Mun Basin, Roi Et Province, Northeast Thailand. This study indicates that length-weight relationship is related by the equation, $W = 0.0025SL^{1.52}$, ($R^2 = 0.85$). Fecundity ranged from 155–784 eggs. Fecundity-length relationship was related by the equation, $Fe = 2.2014SL^{1.56}$; ($R^2 = 0.85$) and Fecundity–weight by $Fe = 901.0637W^{0.91}$; ($R^2 = 0.78$).

KEY WORDS *Rasbora rubrodorsalis*; Fecundity; length-weight relationship; Thailand.

Received 12.11.2018; accepted 19.12.2018; printed 30.12.2018; published online 07.01.2019

INTRODUCTION

The Sieo River is a tributary of Mun River Basin. Sieo River originates at Nong Bor reservoir, Borabu District, Maha Sarakham Province, Northeast Thailand. This river system runs through several district, including Wapi Pathum District, Pathum Rat District, Kaset Wisai, Suvarnabhumi, Phon Sai, and Phanom Prai. In addition, the river flows to the Mun River Basin at Rasi Salai District, Si Sa Ket Province, Northeast Thailand with a total length of about 250 kilometers. Sieo River is one of the major rivers of Roi Et Province and a very important river basin, but very little is known about aquatic resources in this area, including biological data of fish populations.

The freshwater cyprinid fish genus, *Rasbora* Bleeker 1859 (order Cypriniformes Bleeker, 1859, family Cyprinidae Cuvier, 1817) has been reported from Indian Subcontinent to Southeast Asia (Blyth, 1860; Talwar & Jhingran, 1991; Doi, 1997; Kottelat, 2013). *Rasbora rubrodorsalis* Donoso-Büchner et Schmidt, 1997 is a small cyprinid fish widely distributed in Southeast Asia. In Thailand, the fish is reported from Chao Phraya Basin, Mekong Basin, Meklong-Petchaburi Basin, Southeast Basin, and Peninsular Basin (Vidthayanon et al., 1997). In this region, its biological data are poorly known in the natural habitat, such as feeding habit, spawning season, growth rate, fecundity, and others.

A survey project aimed at studying freshwater fishes in the tributary of Sieo River, Mun Basin, Roi

Et Province, Northeast Thailand was carried out in October 2018. *Rasbora rubrodorsalis* specimens were collected, using beach seine, along with other fishes including *Amblypharyngodon chulabhornae* Vidthayanon et Kottelat, 1990, *Esomus metallicus* Ahl, 1923, *Rasbora borapetensis* Smith, 1934, *Puntius brevis* (Bleeker, 1849), *Oryzias songkhramensis* Magtoon, 2010, *Trichopsis schalleri* Ladiges, 1962, *Trichopsis vittata* (Cuvier, 1831), *Trichopodus trichopterus* (Pallas, 1770), *Anabas testudineus* (Bloch, 1792), and others. The purpose of this study is to provide new preliminary data on the biology of *R. rubrodorsalis*.

MATERIAL AND METHODS

Field study was carried out October 2018. Thirty-three specimens of mature female cyprinid fish, *R. rubrodorsalis*, were collected using beach seines (1x1 mm) in an irrigation canal, a tributary of Sieo River, Mun River Basin at Pathum Rat District, Roi Et Province, Northeast Thailand (Fig 1). The length-weight relationship and the fecundity have been studied as reported by Krebs (1998).

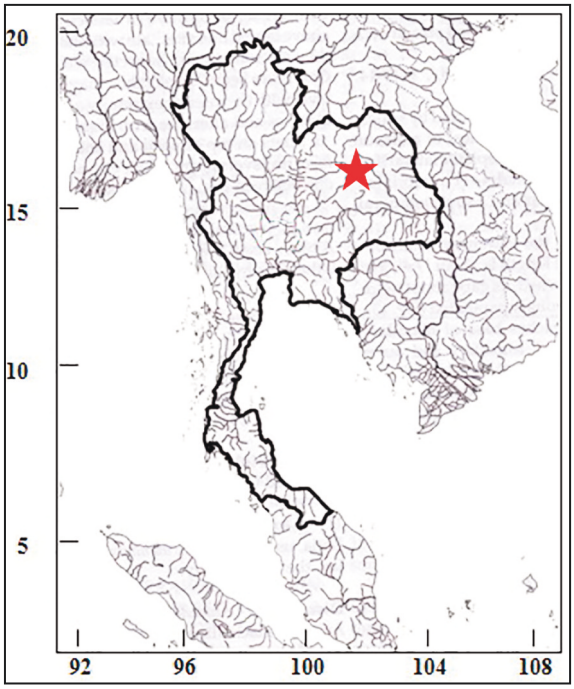

Figure 1. Study area: tributary of Sieo River, Roi Et Province, Northeast Thailand.

RESULTS AND DISCUSSION

Length-Weight relationship

From all specimens, 33 mature females (Fig. 2) have been collected. Standard length ranged from 17 mm to 39 mm (mean ± *SD*: 25.49 ± 6.22) and weight from 0.2 to 0.7 grams (mean ± *SD*: 0.36 ± 0.17). The length–weight relationship equation (mature females) was: $W = 0.0025SL^{1.52}$, ($R^2 = 0.85$) where, *W* = weight of specimens (g); *SL* = standard length of specimens (mm)

Fecundity

Data from 33 mature females have been collected. Fecundity ranged from 155–784 eggs (mean ± *SD*: 360.24 ± 157.88). Relationships were estimated between fecundity and standard length and weight, respectively. Fecundity–Length relationship: $2.2014SL^{1.56}$; (R^2 = 0.85) where *Fe* = fecundity of specimens (eggs); *SL* = standard length of specimens (mm). Fecundity–Weight relationship: $Fe = 901.0637W^{0.91}$; ($R^2 = 0.78$) where, *Fe* = fecundity of specimens (eggs); W = weight of specimens (g).

According to this study, it has been found that October, 2018, was the period of time when *R. rubrodorsalis*, during their reproductive period, had been easily found and there were a lot of them living in Sieo River. The general characteristics of the water source where they have been found is a small canal with a water level of more than 1 meter in rainy season, whereas there would be quite less water in other seasons. During the time when the samples have been collected, the water source in the studying area was characterized by being transparent, with the depth of about 30 centimeters, a lot of water plants were found. It was also the living site of many kinds of small freshwater fishes. Most of them were *A. chulabhornae*, secondly *O. songkhramensis*, followed by *R. borapetensis*. This is consistent with the study of Petsut et al. (2016), who found that during September–October of every year, *R. rubrodorsalis* often move from the main river into the small water source or temporary water source such as rice field districts, or small irrigation canals. Most of them are found in the area filled with water plants, as it is appropriate for them to lay eggs. The properties of water that is appropriate as the living site of *R. rubrodorsalis* according to

Figure 2. *Rasbora rubrodorsalis*, mature females, 34 mm SL, from tributary of Sieo River, Northeast Thailand.

the report of Petsut et al. (2016) are as follows: temperature of 31.0–33.5 Degree Celsius, pH of 6.35–7.32, total ammonia amount of 0.043–0.045 milligram/liter, nitrite of 0.160–0.616 milligram/liter, nitrate of 0.461–0.499 milligram/liter, and orthophosphate of 0.020–0.022 milligram/liter.

Morioka et al. (2014) reported the study result related to growth rate, age, and reproduction of *R. rubrodorsalis* in Laos and that the *R. rubrodorsalis*'s reproduction is "size sexual dimorphism". This means that when it is smaller, the *R. rubrodorsalis* would be male, but when it grows, it would become female. Therefore, the female samples include only the large-size samples. This indicates that females grow larger than males. In this study, it was found that the female fish's size during the reproductive period would be 17 millimeters to 39 millimeters (mean ± SD: 25.49 ± 6.22) and weight from 0.2 to 0.7 grams (mean ± SD: 0.36 ± 0.17) with fecundity ranged from 155–784 eggs (mean ± SD: 360.24 ± 157.88). This is similar to the study results in Laos. Also, Morioka et al. (2014) reported that *R. rubrodorsalis* in natural water sources are omnivorous, as their main feed includes zooplankton (copepods, rotifers and daphnids) and aquatic insects.

CONCLUSIONS

Preliminary data discussed herein suggest that length and weight of cyprinid fish, *R. rubrodorsalis* in Roi Et Province, Northeast Thailand is related. Fecundity (155–784 eggs) was found to be related to body length and weight.

ACKNOWLEDGEMENTS

We wish to thank the anonymous reviewers for their invaluable editorial advices. A very special thanks to the Save Wildlife Thailand Team for collecting some specimens used in this study. Finally, we are grateful to all our partners for their support.

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