

Endemic fishes in the Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province, Thailand

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ABSTRACT

In the present paper, 9 endemic fishes - *Devario cf. regina* (Fowler, 1934) (Teleostei Danionidae); *Poropuntius melanogrammus* Roberts, 1998 (Teleostei Cyprinidae); *Garra surinbinnani* Page, Ray, Tongnunui, Boyd et Randall 2019 (Teleostei Cyprinidae); *Schistura balteata* (Rendahl, 1948) (Teleostei Nemacheilidae); *Schistura cf. aurantiaca* Plongsesthee, Page et Beamish, 2011 (Teleostei Nemacheilidae); *Paracanthocobitis nigrolineata* Singer, Pfeiffer et Page, 2017 (Teleostei Nemacheilidae); *Lepidocephalichthys cf. berdmorei* (Blyth, 1860) (Teleostei Cobitidae); *Batasio tigrinus* Ng et Kottelat, 2001 (Teleostei Bagridae); *Amblyceps variegatum* Ng et Kottelat, 2000 (Teleostei Amblycipitidae) - are recorded from the Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province, Western Thailand. Biological and taxonomic observations on these species are provided.

KEY WORDS

Endemic fishes; Cyprinidae; Suan Phueng; Ratchaburi Province.

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INTRODUCTION

The Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province, Western Thailand, covers a total area of approximately 21,264.8 hectares and consists of a nature information center, a nature study trail, and a forest area. The Royal Initiative Natural Science Park provides services and disseminates natural science knowledge to children, youth, and the general public interested in studying nature. The Royal Initiative Natural Science Park's topography consists mostly

of mountains and plateaus. The water sources in the area originate from several streams in the Tenasserim Mountain Range in Suan Phueng District, Ratchaburi Province. These streams converge to form Kao Chan Waterfall and Boa Wee Waterfall. Both waterfalls are part of the headwaters of the Hui Phak Stream and Lam Pha Chi Stream in Suan Phueng District. Water from Suan Phueng District flows into Mae Kwae Noi and then into Mae Klong River in Mueang District, Kanchanaburi Province, Western Thailand.

In a survey project of freshwater fishes at the

Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province, Western Thailand, carried out in May 2023–March 2024. The authors found several specimens of 9 endemic fishes (Figs. 7–15) in the hill stream and waterfall ecosystems of The Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province, Western Thailand, which is a record of 9 endemic fishes in this region.

RESULTS

Endemic fishes in the Royal Initiative Natural Science Park Project Suan Phueng

Devario cf. *regina* (Fowler, 1934)

The genetic data examination of *Devario* cf. *regina* in study areas found that its genetic characteristics differ from those of other *Devario regina* in Thailand. It is possible that it is a new species. Moreover, data and further verification are currently being collected. In addition, the *Devario* cf. *regina* is a good indicator of water quality and has the potential to be developed into a commercial ornamental fish. We found many specimens of the fish at Kao Chan waterfall (Fig. 1) and Boa Wee waterfall (Fig. 2).

Poropuntius melanogrammus Roberts, 1998

This species was reported only in Mae Khlong basin (Kanchanaburi and Ratchaburi Province, Thailand). In a survey project of freshwater fishes at the Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province, Western Thailand, we found many specimens of the fish at Lam Pha Chi stream in Boa Wee village (Fig. 4), Lam Pha Chi stream in Tha Kula village (Fig. 5) and Hui Phak stream (Fig. 6). The fish are rarely found in Thailand, but they have the potential to be developed into commercial ornamental fish.

Garra surinbinnani Page, Ray, Tongnunui, Boyd et Randall 2019

This species was reported only in Mae Khlong basin (Kanchanaburi and Tak Provinces, Thailand). In a survey project of freshwater fishes at the Royal

Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province, Western Thailand, we found many specimens of the fish at Kao Chan waterfall (Fig. 1) and Boa Wee waterfall (Fig. 2). The fish is highly sensitive to environmental changes, so it can also be used to indicate good water sources. In Suan Phueng District, this fish is found only in waterfall and mountain stream ecosystems.

Schistura balteata (Rendahl, 1948)

The fish is endemic to the Mae Klong hill stream in Kanchanaburi and Ratchaburi province. It was collected from natural water sources in Kanchanaburi province in large quantities to be exported as ornamental fish to foreign countries, but it has not yet been commercially cultivated. As a result, the fish population in natural water sources has significantly decreased. We found many specimens of the fish at Kao Chan waterfall (Fig. 1), Boa Wee waterfall (Fig. 2) and Boa Wee hill stream (Fig. 3).

Schistura cf. *aurantiaca* Plongsesthee, Page et Beamish, 2011

Schistura aurantiaca has been reported to be found only in the watershed in Sangkhla Buri District, Kanchanaburi Province, Western Thailand. However, genetic testing of samples of *Schistura* cf. *aurantiaca* from the study area (Kao Chan waterfall, Fig. 1) found it different from the fish in Kanchanaburi and other fish in Thailand. It is possible that this may be a new species and is currently in the process of collecting data and further verification.

Paracanthocobitis nigrolineata Singer, Pfeiffer et Page, 2017

This fish is endemic to the Mae Klong River Basin and is adaptable. In the Royal Initiative Natural Science Park, it can be found in every ecosystem, from the mountains to the stream.

Lepidocephalichthys cf. *berdmorei* (Blyth, 1860)

The genetic examination of *Lepidocephalichthys* cf. *berdmorei* in Hui Phak stream (Fig. 6) found genetic differences between *Lepido-*



Figures 1–6. Habitats of endemic fishes in the Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province; Kao Chan waterfall (Fig. 1), Boa Wee waterfall (Fig. 2), Boa Wee hill stream (Fig. 3), Lam Pha Chi stream in Boa Wee village (Fig. 4), Lam Pha Chi stream in Tha Kula village (Fig. 5), Hui Phak stream (Fig. 6).

cephalichthys bermorei in Burma and India. This may be a new species. Moreover, there is currently little information about this species in Thailand. We are currently in the process of collecting data and further verification.

Batasio tigrinus Ng et Kottelat, 2001

The fish is endemic to the Mae Klong hill stream in Kanchanaburi and Ratchaburi provinces.

It is considered a good indicator of water resources and is sensitive to environmental changes. It also has beautiful colors, so it has the potential to be developed as a commercial ornamental fish. We found many specimens of the fish at Lam Pha Chi stream in Boa Wee village (Fig. 4), Lam Pha Chi stream in Tha Kula village (Fig. 5) and Hui Phak stream (Fig. 6).

Amblyceps variegatum Ng et Kottelat, 2000

The fish is endemic to the Mae Klong and Phetchaburi hill streams. The fish is considered a good indicator of water resources and is sensitive to environmental changes. In the Royal Initiative Natural Science Park, this fish can be found in Kao Chan waterfall (Fig. 1) and Hui Phak stream (Fig. 6).

Water quality in habitats of endemic fishes in the Royal Initiative Natural Science Park Project Suan Phueng

A comparison of the study area's water quality with the standard criteria of the National Bureau of Agricultural Commodity and Food Standards (ACFS), Ministry of Agriculture and Cooperatives of Thailand, found that the overall water quality of the study areas was good and suitable for aquatic

animal survival. The accumulation of primary nutrients in water sources, namely ammonia, nitrite, nitrate, orthophosphate, and phosphate, was appropriate and did not negatively affect aquatic animals (ACFS, 2016).

Considering the average water quality each month, it was found that water sources in the area have an average water temperature that is relatively low almost all year round, with values between 25–29 degrees Celsius. Most water sources have a transparency that reaches the water bottom, an average depth from the water surface of 34–58 centimeters, an average pH of neutral to slightly acidic, between 6.37–6.93, and a high dissolved oxygen value all year round, with an average value between 5.99–7.55 milligrams per liter. These water quality factors indicate that the water source is good and has suitable characteristics for being

Parameter	Water quality					
	May	July	September	November	January	March
Temperature (°C)	29.17±1.78	29.59±1.35	26.77±2.08	25.90±2.63	25.11±1.97	27.47±2.88
Transparency (cm)	43.50±35.38 (bottom)	40.00±36.95 (bottom)	58.00±39.60 (bottom)	52.00±36.99 (bottom)	40.00±0.85 (bottom)	34.50± 4.12 (bottom)
Dissolved oxygen (mg/L)	6.90±3.08	6.36±2.94	7.55±2.67	7.09±2.60	5.99±2.41	6.04±2.88
pH	6.78±0.58	6.37±0.31	6.74±0.37	6.56±0.28	6.85±0.40	6.93±0.57
Alkalinity (mg/L)	69.00±43.79	55.00±37.71	35.00±28.55	31.00±20.74	58.00±1.72	68.00±40.28
Ammonia (mg/L)	0.080±0.055	0.070±0.063	0.006±0.004	0.046±0.050	0.048±0.033	0.040±0.036
Nitrite (mg/L)	0.004±0.002	0.003±0.002	0.004±0.002	0.002±0.001	0.003±0.001	0.004±0.004
Nitrate (mg/L)	0.122±0.093	0.110±0.056	0.105±0.036	0.080±0.034	0.096±0.029	0.023±0.023
Orthophosphate (mg/L)	0.043±0.036	0.038±0.030	0.031±0.032	0.031±0.033	0.041±0.098	0.034±0.015
Phosphate (mg/L)	-	0.087±0.127	0.043±0.012	0.030±0.007	0.042±0.027	0.071±0.059

Table 1. Average and standard deviation of water quality in habitats of endemic fishes in the study areas, carried out in May 2023–March 2024.



Figures 7–14. Endemic fishes in the Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province: *Devavio* cf. *regina* (Fig. 7), *Poropuntius melanogrammus* (Fig. 8), *Garra surinbinnani* (Fig. 9), *Schistura balteata* (Fig. 10), *Schistura* cf. *aurantiaca* (Fig. 11), *Paracanthocobitis nigrolineata* (Fig. 12), *Lepidocephalichthys* cf. *berdmorei* (Fig. 13), *Batasio tigrinus* (Fig. 14).



Figure 15. Endemic fishes in the Royal Initiative Natural Science Park Project Suan Phueng, Ratchaburi Province: *Amblyceps variegatum*.

a watershed ecosystem. Furthermore, from examining the amount of nutrient accumulation in the water source, including ammonia, nitrite, nitrate, orthophosphate, and phosphate, it was found that all year round, the water sources in the study area had low primary nutrients, which are very suitable for the survival of aquatic animals. The total alkalinity value in this study was in the appropriate range, set at 50–200 mg/l. In open water sources where water is circulated constantly, the alkalinity value will vary according to the season, rainfall, topography, etc. (Srisaphum et al., 2016). The results of water quality in each month are shown in Table 1.

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