



First Record of Macedonian Vimba *Vimba melanops* (Heckel, 1837) (Actinopterygii: Cyprinidae) in the Bulgarian Stretch of the Mesta (Nestos) River

Tihomir Stefanov¹ & Apostolos Apostolou²

¹National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd., 1000 Sofia, Bulgaria;
E-mail: tishos@gmail.com

²Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd., 1000 Sofia;
E-mail: apostolosfish@abv.bg

Abstract: One specimen of *Vimba melanops* (Heckel, 1837) has been collected in the Bulgarian stretch of the Mesta River near the village of Hadzhidimovo (south of the town of Gotse Delchev) in August 2019. This is the first documented record of the species in the basin of Mesta (Nestos) River. Its origin is probably due to stocking activities in the Potamoi Reservoir in Greece.

Key words: *Vimba melanops*, Cyprinidae, Mesta River, stocking.

Introduction

The Macedonian vimba *Vimba melanops* (Heckel, 1837) is a medium-sized cyprinid fish endemic to the Northern Aegean Sea basin. It has been recorded from Maritsa (Evros) River near Plovdiv in Bulgaria; its distribution covers the lower and middle reaches, from the basin of Maritsa River west to the Pinios drainage (KOTTELAT & FREYHOF 2007), with a surprising disjunction representing the basin of Mesta River. In Bulgaria, *V. melanops* is well known in the Maritsa River drainage (KOVATCHEFF 1921, 1923, CHICHKOFF 1939, DRENSKY 1948, 1951, MICHAILOVA 1965a, KARAPETKOVA & ZIVKOV 1995, PEHLIVANOV 2000, STEFANOV & TRICHKOVA 2004, VASSILEV & PEHLIVANOV 2005, KOLEV 2013, 2014) as well as in the Struma (Strymon) River basin (KOVATCHEFF 1923, MICHAJLOVA 1965b, STEFANOV 2001, VASSILEV & PEHLIVANOV 2002, 2005).

The presence of Macedonian vimba in both Bulgarian and Greek parts of the Mesta River has remained doubtful until now. The first information

published by DRENSKY (1930) stated without providing any evidence that the species might occur in the Mesta River. CHICHKOFF (1939) assumed that, based on its distribution in Maritsa, Vardar (Axios) and Pinios rivers, this species should also occur in Mesta and Struma but most likely only in their lower courses. DRENSKY (1948, 1951) also believed that *V. melanops* might be found in the Mesta River. Probably based on this vague information, VASSILEV & PEHLIVANOV (2005) included Mesta River in the geographical range of the species; however, no specimens were collected to prove this statement. There is no published evidence for the presence of *V. melanops* in the Greek stretch of the river. ECONOMIDIS (1974, 1991) also stated that the species might occur in this stretch based on the above-mentioned sources but he did not find it during his detailed survey. Recently, BARBIERI et al. (2015) mentioned that the species has not been recorded in Nestos and Vistonis-Filiouris drainages.

In the present article, we report the first documented record of *Vimba melanops* from the Mesta (Nestos) River.

Materials and Methods

On 14 August 2019, one adult specimen of *V. melanops* (208 mm *TL*) was caught in the Bulgarian stretch of Mesta River near the village of Hadzhidimovo (Fig. 1), south of the town of Gotse Delchev (GPS coordinates: N 41.51586°; E 23.89091°). The specimen was caught in a fast flowing part of the river using electrofishing equipment Hans Grassl IG200-2. The habitat corresponded very well with the typical environmental requirements of the species, i.e. river

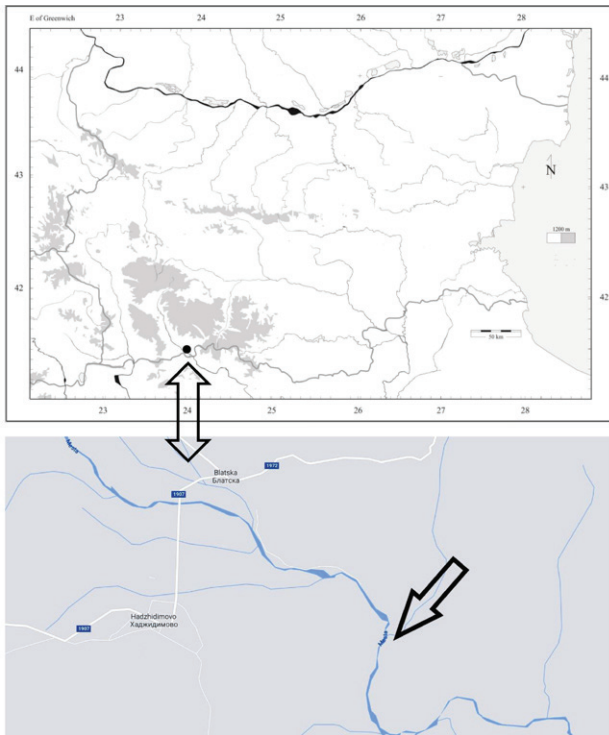


Fig. 1. Locality where *Vimba melanops* was found in the Bulgarian stretch of the Mesta River near Hadzhidimovo village.



Fig. 2. Habitat where *Vimba melanops* was found in the Bulgarian stretch of Mesta River.

with fast current and bottom substrate formed by sand, stones and gravel (Fig. 2). The specimen was initially stored in formalin and then moved to 70% ethanol. Later, it was deposited in the ichthyological collections of the National Museum of Natural History, Sofia (AN 2021/0382).

The method for counting fin rays and lateral line scales as well as all methods for measurements follow KOTTELAT & FREYHOF (2007). All measurements were made point-to-point with a digital calliper and recorded to the nearest of 0.1 mm. Standard length (*SL*) was measured from the tip of the snout to the posterior margin of the hypurals.

Results

The collected specimen possessed all typical features for *V. melanops*, i.e. the back behind the dorsal fin not keeled, 53 scales in the lateral line, 17½ branched rays in anal fin and 7½ in the dorsal fin. The coloration was typical but the characteristic black midlateral stripe was not prominent as it was caught at the end of the spawning period (Fig. 3). The specimen had small differences in some of the body proportions compared to those from the Struma and Maritsa rivers in Bulgaria and Greece (Table 1). It had slightly smaller dorsal and anal fins compared to the specimens from Greek part of the Maritsa River – *lD* in % of *SL* 11.7 versus 11.8–14; *hD* in % of *SL* 20.9 versus 22.1–26.8; *hA* in % of *SL* 13.3 versus 14.4–17.5. The caudal peduncle was more elongate compared to the specimens from Greek part of the Maritsa River (*lpc* in % of *SL* 17.4 versus 11.5–15.5) and slightly more stumpy (*h* in % of *SL* 10 versus 10.1–11.7). The body depth was smaller compared to the specimens from Maritsa River in both parts in Bulgaria and Greece – *H* in % of *SL* 24.5 versus 24.7–32.6 (summarized range for both parts). Postdorsal length was bigger compared to the specimens from Maritsa River in Greece (*poD* in % of *lc* 39.8 versus 34.2–38.4).

Discussion

This is the first record of *V. melanops* in the Bulgarian part of the Mesta River and first record in Bulgaria outside Maritsa and Struma drainages. It is not yet known how *V. melanops* appeared in the Mesta River basin and what is the recent number and biomass of its population. Possible vector of its origin is probably fish stocking activities in the Potamoi Reservoir in Greece. There is still not clear evidence for official aquaculture activities involving this species by the fishery authorities in both Bulgaria and Greece. *Vim-*



Fig. 3. *Vimba melanops* (208 mm TL) caught in the Bulgarian stretch of Mesta River near Hadzhidimovo Village.

Table 1. Body proportions of *Vimba melanops* from Struma and Maritsa River (presented as the range followed by the mean in parentheses) and the specimen from the Mesta River. Abbreviations for the measurements used are as follows: TL – total length, SL – standard length, lc – head length, pD – predorsal length, poD – postdorsal length, pA – preanal length, lpc – length of caudal peduncle, lD – length of dorsal fin base, hD – height of dorsal fin, lA – length of anal fin base, hA – height of anal fin, H – maximum body depth, h – least depth of caudal peduncle, prO – snout length, do – horizontal diameter of eye, poO – postorbital length, io – interorbital width.

Locality Source	Mesta River Present study	Struma River Present study	Maritsa River CHICHKOFF (1939)	Maritsa River ECONOMIDIS (1974)
n	1	50	14	21
% of SL				
lc	24.5	22.4 – 26.2 (24.4)	24.5 – 26.5 (25.2)	23.8 – 26.2 (23.6)
pD	51.7	50.5 – 55.1 (52.4)	51.3 – 52.8 (51.8)	51.6 – 56.3 (54.4)
poD	39.8		39.2 – 41.1 (40.3)	34.2 – 38.4 (36.3)
lpc	17.4	14.9 – 19.2 (16.9)	16.8 – 18.5 (17.7)	11.5 – 15.5 (13.9)
lD	11.7	9.8 – 12.8 (10.7)	11.3 – 12.6 (11.8)	11.8 – 14 (12.6)
hD	20.9	18.2 – 23.8 (20.8)	19.9 – 21.9 (20.9)	22.1 – 26.8 (24.7)
lA	17.9	14.2 – 19.1 (16.7)	16.2 – 19.5 (17.5)	15.9 – 20.7 (18.8)
hA	13.3	11.5 – 15.4 (13.2)	12.5 – 14.2 (13.3)	14.4 – 17.5 (16.2)
H	24.5	23.9 – 29.8 (26.9)	24.7 – 28.9 (25.8)	28.7 – 32.6 (30.6)
h	10	8.9 – 10.3 (9.6)	9.5 – 10.5 (9.9)	10.1 – 11.7 (11)
% of lc				
prO	36.1	30.0 – 36.9 (33.3)	34.3 – 38.1 (36.8)	31.5 – 36.9 (33.7)
do	22.5	22.2 – 32.7 (26.2)	20.5 – 23.7 (22.2)	20.4 – 25.1 (22.9)
poO	48.7	42.0 – 46.7 (44.5)	45.2 – 48.3 (46.7)	43 – 49.7 (46.4)
io	33.8	-	32.2 – 36.2 (33.9)	31.3 – 35.3 (33.3)

ba melanops was probably introduced accidentally together with the stocking material of other species of economic importance by local fishermen in the area.

The species is included in the Bulgarian Red Data Book as “Vulnerable” and the present finding is important in order to expand the knowledge on its geographical range in the country. Invasive biology in most of the cyprinid fish endemic for the Aegean Sea watershed is not known yet, and an invasive behaviour is yet not described for *V. melanops*. It would be interesting to follow whether the species will expand its range and increase in number in the Mesta River basin or not.

References

- APOSTOLOU A. 2005. The ichthyofauna from the Bulgarian sector of the Mesta River. *Acta Zoologica Bulgarica* 57 (2): 191–196.
- APOSTOLOU A., KOUTRAKIS M., PEHLIVANOV L., VASSILEV M., STEFANOV T. & VELKOV B. 2010. Notes on the fish fauna composition of Mesta (Nestos) River in regard to management and conservation. *Acta Zoologica Bulgarica* 62 (3): 271–276.
- BARBIERI R., ZOGARIS S., KALOGIANNI E., STOUMBOUDI M. TH., CHATZINIKOLAOU Y., GIAKOUMI S., KAPAKOS Y., KOMMATAS D., KOUTSIKOS N., TACHOS V., VARDAKAS L. & ECONOMOU A. N. 2015. Freshwater Fishes and Lampreys of Greece: An annotated checklist. *Monographs on Marine Sciences* No.

8. Hellenic Centre for Marine Research, Athens, Greece, 130 p.
- CHICHKOFF G. 1939. Poissons nouveaux et peu connus des eaux douces de la Bulgarie. *Annuaire de l'Universite de Sofia, Faculté de Sciences* 35 (3): 91–199. (In Bulgarian).
- ECONOMIDIS P. S. 1974. Etude morphologique, systematique et zoogeographique de poissons d'eau douce de Macedoine d'Est et de Thraki. PhD Thesis. University of Thessaloniki, Greece, 598 p. (In Greek)
- ECONOMIDIS P. S. 1991. Check List of freshwater fishes of Greece: Recent status of threats and protection. Hellenic Society for the Protection of Nature, Special Publication, Athens, 48 p.
- ECONOMIDIS P. S., KOUTRAKIS M., APOSTOLOU A., VASSILEV M. & PEHLIVANOV L. 2009. Atlas of the fish fauna of Mesta River. NAGREF Institute of Fisheries Research, Kavala, Greece and Bulgarian Academy of Sciences, Sofia, Bulgaria, 300 p. (In Bulgarian and Greek).
- DRENSKY P. 1930. Zur Kenntnis des Süßwasserfischfauna Bulgariens. *Zoologische Jahrbücher, Abteilung für Systematik, Ökologie und Geographie der Tiere* 59: 63–680.
- DRENSKY P. 1948. Synopsis and distribution of fishes in Bulgaria. *Annuaire de l'Universite de Sofia, Faculté de Sciences* 44 (3): 11–71. (In Bulgarian)
- DRENSKY P. 1951. Fishes of Bulgaria. Fauna of Bulgaria. II. BAS, Sofia, 270 p. (In Bulgarian)
- KARAPETKOVA M. & ŽIVKOV M. 1995. [The fishes of Bulgaria]. Gea Libris, Sofia, 246 p. (In Bulgarian)
- KOLEV V. 2013. Species Composition of the Ichthyofauna of Some Tributaries of the Maritza River. *Forestry Ideas* 19 (2): 129–139.
- KOLEV V. 2014. Research on the Ichthyofauna in the Lower Tundja River in Relation to Alternative Forms of Tourism in the Region of Yambol and Elhovo. *Management and Sustainable Development* 49: 94–102.
- KOTTELAT M. & FREYHOF J. 2007. Handbook of European Freshwater Fishes. Kottelat, Cornol Switzerland and Freyhof, Berlin, Germany. 646 p.
- KOVATCHEFF V. 1921. [An attempt for studying the fish fauna of Maritsa and its tributaries.] *Travaux de la Societe Bulgare des sciences naturelles*, Sofia, 9: 90–94. (In Bulgarian)
- KOVATCHEFF V. 1923. Faune des poissons d'eau douce en Bulgarie. *Archives du Ministere de l'Agriculture et des Domaines du Royaume de Bulgarie* 3: 1–164. (In Bulgarian)
- MICHAILOVA L. 1965a. Über die Ichthyofauna Thrakiens. In: PASPALEV G. (Ed.): *Die Fauna Thrakiens. II*. Verlag der Bulgarischen Akademie der Wissenschaften, Sofia, pp. 265–288. (In Bulgarian)
- MICHAILOVA L. 1965b. Untersuchungen über die fischfauna des Struma-flusses. *Bulletin de l'Institut de Zoologie et Musee* 19: 55–71. (In Bulgarian)
- PEHLIVANOV L. 2000. Ichthyofauna of the East Rhodopes (South Bulgaria): composition and distribution. *Acta Zoologica Bulgarica* 52 (3): 45–53.
- PENCZAK T., JANKOV J., DIKOV Ts. J. & ZALEWSKI M. 1985. Fish Production in the Mesta River, Rila Mountain, Samokov Bulgaria. *Fisheries Research* 3: 201–221.
- STEFANOV T. 2001. Ichthyofauna of Struma River in the part between Kocherinovo railway station and the mouth of Strumeshnica River. In: BERON P. (Ed.): *Biodiversity of Kresna Gorge (SW Bulgaria)*. pp. 289–296. (In Bulgarian).
- STEFANOV T. & TRICHKOVA T. 2004. Fish species diversity in the Eastern Rhodopes (Bulgaria). In: BERON P. & POPOV A. (Eds.): *Biodiversity of Bulgaria 2. Biodiversity of Eastern Rhodopes (Bulgaria and Greece)*. Pensoft & Nat. Mus. Natur. Hist., Sofia, pp. 849–861.
- VASSILEV M. & PEHLIVANOV L. 2002. The ichthyofauna of the Bulgarian part of the Struma River. *Historia Naturalis Bulgarica* 14: 103–108. (In Bulgarian).
- VASSILEV M. & PEHLIVANOV L. 2005. Checklist of Bulgarian freshwater fishes. *Acta Zoologica Bulgarica* 57 (2): 161–190.

Received: 04.02.2020

Accepted: 25.04.2021