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Cobitis (Bicanestrinia) rhodopensis, spec. nov. from Bulgaria

(Pisces, Cobitidae)

Milen Vassilev

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Cobitis rhodopensis, spec. nov. is described established from the Krumovitsa and the Biala Rivers, East Rhodope Mountain, Aegean Sea basin. This is the second representative of the subgenus *Bicanestrinia* in Bulgaria. The description of the new species, the biometrical characteristics of its morphological features, and the comparison with related species are given.

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Introduction

In this paper a new species of the genus *Cobitis* Linnaeus (1758) is described from the rivers Krumovitsa and Biala (South-Eastern Bulgaria, East Rhodope Mountain, Aegean Sea basin) that is included in the subgenus *Bicanestrinia* Bacescu (1961). The new species is compared with the two already known species of the subgenus *Bicanestrinia* in the European waters, namely *Cobitis trichonica* Stephanidis, 1974 from the lakes of Etolo-Acarmania (western part of mainland Greece) and *Cobitis peshevi* Sivkov & Dobrovolov, 1984 from main part of Eastern Bulgaria (Black Sea basin) and some tributaries of the Struma and the Maritsa Rivers (Aegean Sea basin).

The typical species of the subgenus *Bicanestrinia*, *Cobitis simplicispina* Hanco, 1924 was described from Asia Minor, together with *C. phrygica* Battalgi, 1944 and *C. battalgili* Bacescu. 1961. Bianco & Nalbant (1980) further added to that group the species *C. linea* Heckel, 1846 from Iran.

Material and methods

The material (35 specimens) was collected during summer 1995 in the Biala and the Krumovitsa Rivers (Aegean Sea basin). The samples have been taken from the middle and the lower sections of the rivers using ichthyological sacs.

Some measurements and descriptions of specimens were done in the field with fresh material. The further processing of material was carried out in the laboratory with samples fixed in 4 % formaldehyd. The morphological description is based on 8 meristic and 24 metric characters (Tab. 1). Comparisons with other species are based on data from the literature (Pellegrin 1928, Battalgi 1944, Berg 1949, Bacescu 1961, Stephanidis 1974, Bianco & Nalbant 1980, Sivkov & Dobrovolov 1984, 1986). The biometrical characters of the morphological features of *Cobitis rhodopensis* in tab. 1 are given for both males and females together, since there are no reliable differences in the average values of the measuring characters between sexes, except for the body length.

In the statistical processing of data the CD of Mair (1971) and t-criterion of Student (Zaitsev 1984) are used.

Cobitis rhodopensis, spec. nov.

(Figs 1a, b)

Types. Holotype: ♂, 73 mm SL, caught on 28.08.1995. in the middle flow of the Biala River (a tributary of the Maritsa River), downstream of the Meden buk village. Collected by the author and deposited in his collection No 199501C in the Department of Hydrobiology, Institute of Zoology, BAS, Sofia. – Paratypes: 34 specimens (18♂♂, 10♀♀, 6 juv.), caught in June and August 1995 in the Krumovitsa River (a tributary of the Arda River) and the Biala River (in same collection as holotype).

Diagnosis. A species of the genus *Cobitis* (subgenus *Bicanestrinia*) with two scales of Canestrini on the two first rays of the pectoral fin in males. Body colouring similar to that of *C. taenia* (Berg 1949, Drenski 1951), differs by two (rarely one) black spots at the caudal base; the dark stripes on both sides of head do not extend behind the eyes. Males are smaller than females.

Tab. 1. Biometrical characteristic of the morphological features of *Cobitis rhodopensis*, spec. nov.

| Characters | lim | x | S | n |
|---------------------------------|-------------|-------|-------|----|
| SL(standard length) mm | 55.0-85.5 | 66.10 | 10.11 | 24 |
| D (dorsal fin rays) | 7-8 | 7.25 | 0.45 | 24 |
| A (anal fin rays) | 5-6 | 5.33 | 0.49 | 24 |
| P (pectoral fin rays) | 8 | 8 | 0.00 | 24 |
| V (ventral fin rays) | 5-7 | 5.33 | 0.65 | 24 |
| C (caudal fin rays) | 16 | 16 | 0.00 | 24 |
| sp. br. (gill rakers) | 13-14 | 13.33 | 0.47 | 19 |
| vt. (vertebrae) | 39-41 | 39.62 | 0.78 | 20 |
| In % to the body length SL | | | | |
| IC (head length) | 18.18-20.53 | 19.14 | 0.62 | 24 |
| H (body depth) | 14.54-16.96 | 16.05 | 0.85 | 24 |
| mH (body width) | 8.77-11.92 | 10.45 | 0.94 | 24 |
| h (caudal peduncle depth) | 9.09-11.02 | 10.04 | 0.46 | 24 |
| mh (caudal peduncle width) | 4.43- 5.93 | 4.88 | 0.43 | 24 |
| AD (predorsal distance) | 50.0 -52.27 | 50.88 | 0.89 | 24 |
| PD (postdorsal distance) | 40.43-42.02 | 41.42 | 0.55 | 24 |
| AV (preventral distance) | 50.36-52.98 | 51.50 | 0.84 | 24 |
| AA (preanal distance) | 75.45-78.95 | 76.85 | 1.11 | 24 |
| lc (caudal peduncle length) | 14.85-18.77 | 16.58 | 1.14 | 24 |
| ID (basic dorsal length) | 8.47- 9.94 | 9.32 | 0.44 | 24 |
| HD (dorsal height) | 15.20-17.80 | 16.38 | 0.83 | 24 |
| IA (basic anal length) | 6.85- 8.33 | 7.61 | 0.51 | 24 |
| HA (anal height) | 10.55-15.0 | 13.02 | 1.27 | 24 |
| IP (pectoral length) | 11.46-17.09 | 13.91 | 1.60 | 24 |
| IV (ventral length) | 10.99-14.18 | 12.32 | 1.12 | 24 |
| P-V (pectoral-ventral distance) | 29.67-32.76 | 31.26 | 0.96 | 24 |
| V-A (ventral-anal distance) | 23.97-27.64 | 25.84 | 1.24 | 24 |
| In % to the head length IC | | | | |
| r (snout length) | 35.03-43.64 | 39.84 | 2.82 | 24 |
| o (diameter of eye) | 15.89-19.23 | 17.48 | 1.16 | 24 |
| po (postorbital distance) | 44.44-57.66 | 47.36 | 3.74 | 24 |
| io (interorbital distance) | 16.06-25.0 | 18.94 | 2.53 | 24 |
| HC (head depth) | 59.83-66.24 | 63.55 | 1.92 | 24 |
| mC (head width) | 47.0 -60.58 | 52.76 | 4.18 | 24 |

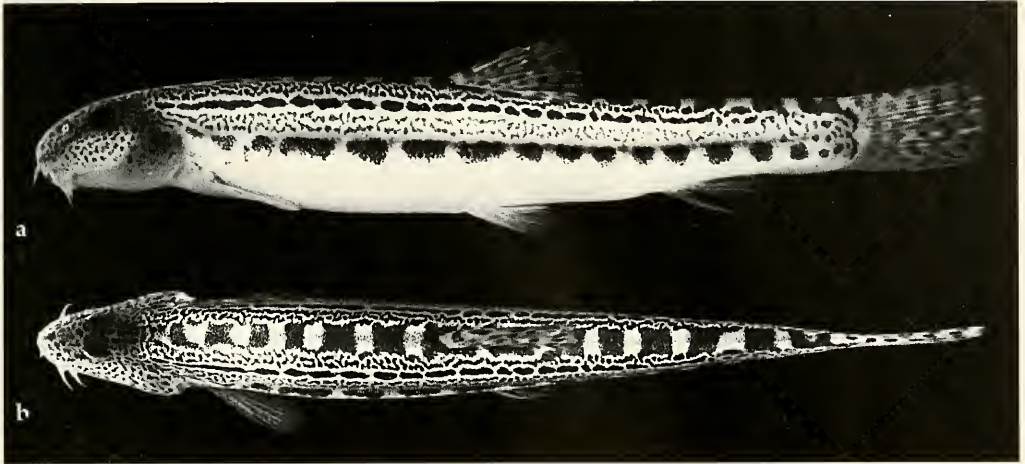


Fig. 1. *Cobitis rhodopensis*, spec. nov. (Biala River, 28.08.1995, SL=73 mm). a. Lateral view. b. Dorsal view.

Description

Dimensions. Males: 55.0-79.0 mm SL; females: 65.0-85.5 mm SL.

Fins. D II-III 7-8, A II-III 5-6, P I 8, V I 5-6 (7) I, C I 14 I; branchial spines 13-14, vertebrae 39-41.

Body elongated, laterally flattened, covered with minute rounded scales. Body depth (height) 5.9-6.9 times in SL, body width 8.4-11.4 times in SL. Head rounded in front, small (4.9-5.5 times in SL), triangular. Head depth larger than head width. Mouth lower with flesh lips. Lower lip bilobate, each lobe divided into two parts. Barbels longer and thinner in males than in females. Suborbital spin bifid, curved inwards. Diameter of eye smaller than or equal to the interorbital distance. Peduncle length 5.3-6.7 times in SL, peduncle depth about two times larger than peduncle width. Caudal peduncle with dermal keel on dorsal and ventral edges. Dorsal fin begins slightly before the ventral base. Caudal fin distinct, with rounded borders. Pectorals equally long in males and females. Males bear on each of the first two pectoral rays one scale of Canestrini. It is semi-circular, triangularly shaped (viewed over the pectoral fins), and covered by the membrane of the fin (Fig. 2a). The detached scales of Canestrini are irregularly-oval shaped with tentacles towards the base of the pectorals (Figs 2b, c). The first scale attached to the first ray, it is two times smaller than the second scale which is attached on the second ray. First scale partially overlaps the second one. In a single specimen only the third scale of Canestrini was found (under the second scale); it is attached to the second ray, is semi-circular and smaller and thinner than the other scales of Canestrini.

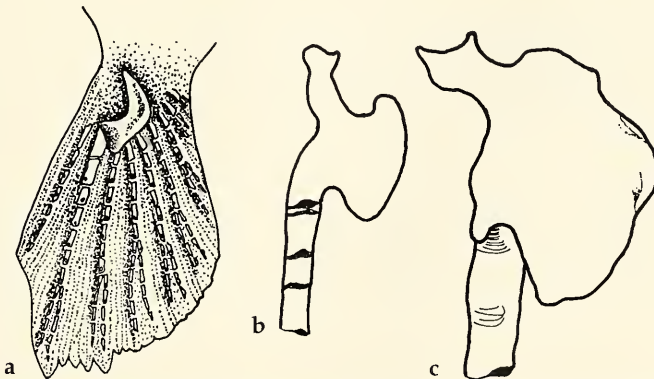


Fig. 2. *Cobitis rhodopensis*, spec. nov. Scales of Canestrini. a. The two scales on the pectoral fin. b. First scale of Canestrini. c. Second scale of Canestrini.

Coloration. Similar to those of *C. taenia*, *C. trichonica*, and *C. peshevi*. Basic colour yellowish. Zones of Gambetta well delineated. On the back 13-19 dark brown spots, mainly rectangularly shaped. The first and the third lines on each body side formed by numerous minute dark spots. The second and the fourth (lateral) lines consist of bigger, well separated, ellipsoidal or irregularly shaped brown spots. There are 13-18 spots in the lateral line. Usually two well delimited black spots (rarely one) at the caudal base. Spots usually dash shaped, one above the other, and the upper one sloping ahead. The upper black spot denser and larger than the lower one. Sometimes, the upper spot even almost two times larger than the lower one. Only one specimen had a single upper spot. The black spots at the caudal base well delimited even in the juvenile specimens. Head with many dots and speckles and with a dark line extending from the snout tip to the eye. Dorsal and caudal fins with 5-6 irregular rows of dark spots. Other fins usually without spots, light coloured.

Sexual dimorphism. Body length of males smaller than in females. No reliable differences in the length of the pectorals between males and females. Males have two scales of Canestrini. Barbels of males thinner and longer than those of females. In males the third pair of barbels (at the corner of the mouth) reach the vertical from the middle of the eye. In females they do not reach the vertical from the anterior border of the eye.

Distribution. So far, *Cobitis rhodopensis*, spec. nov. was found in the middle and the lower reaches of the Krumovitsa River, and along the Biala River (Aegean Sea basin). The first more complete ichthyological investigations in this region (East Rhodope Mountain) were carried out in 1995. *C. rhodopensis* is the only representative of the genus *Cobitis* in both rivers.

Discussion. Comparison with related species: *Cobitis rhodopensis*, spec. nov. is the third representative of the subgenus *Bicaestrinia* in Europe. The differences in comparison with the two European species *C. peshevi* and *C. trichonica*, and with *C. simplicispina*, a typical species of the subgenus from Asia Minor, according to data of Pellegrin (1928), Berg (1949), Bacescu (1961), Stephanidis (1974), and Sivkov & Dobrovolov (1986) are combined in tab. 2.

Tab. 2. Comparison between *C. simplicispina*, *C. trichonica*, *C. peshevi* and *C. rhodopensis*.

| Characteristic | <i>Cobitis simplicispina</i> | <i>Cobitis trichonica</i> | <i>Cobitis peshevi</i> | <i>Cobitis rhodopensis</i> |
|---|-------------------------------------|---------------------------------------|---|--|
| 1. Shape of the body scales | elongated | rounded | rounded | rounded |
| 2. Rays of D | II 6 | II (III) 7 (8) | III 7 | II-III 7-8 |
| 3. Rays of A | II 6 | II-III 5 | III 5 | II-III 5-6 |
| 4. Rays of V | I 6 | II 6 | II 5 | II 5-6 (7) |
| 5. Rays of P | I 7-9 | I 7-8 (9) | I 7-8 | I 8 |
| 6. Suborbital spin | bifid or not bifid, curved outwards | bifid, curved inward | bifid, curved inward | bifid, curved inward |
| 7. Dermal keel | above and below the caudal peduncle | none | above and below the caudal peduncle | above and below the caudal peduncle |
| 8. Lateral spots | none | 7-15 | 14-20 | 13-18 |
| 9. Black spots of caudal base | none | 2 (3) | none | 2 (1) |
| 10. Size of males | equal to the females | smaller than the females | smaller than the females | smaller than the females |
| 11. Length of P fin in males and in females | | smaller in females | smaller in females | equal size |
| 12. Scales of Canestrini | 2, elongated crescent shaped | 2(3), triangular, fanlike, equal size | 2, the 1th- elongated, the 2th-kidneylike | 2(3), irregular oval shape, 1th two times smaller than 2th |

As exemplified in tab. 2, *C. rhodopensis* is most similar externally to *C. peshevi* and *C. trichonica*, and shows greater differences to *C. simplicispina*. According to data and drawings from the works of Battalgil (1944), Bacescu (1961) and Bianco & Nalbant (1980), *C. rhodopensis* differs considerably more from the species of Asia Minor, *C. phrygica*, *C. battalgili* and from the Iranian species *C. linea*.

Exept for the characters N 3, 4, 5, 7, 8, 9, 11 and 12, shown in table 2, *C. rhodopensis* differs from *C. trichonica* by following additional characters: in accordance with Stephanidis (1974), the coloration in female specimens is more bright than that of males. *C. rhodopensis* also differs by the shape of the black spots at the caudal base. Spots in *C. rhodopensis* are more elongated, they are not oval-shaped or semi-circular as in *C. trichonica*. The upper spot in *C. rhodopensis* is always sloping ahead. Both species differ in coloration of dorsal and caudal fins: there are 3 irregular rows of dark spots in *C. trichonica*, while there are 5-6 in *C. rhodopensis*. *C. trichonica* has a shorter caudal peduncle (6.9-8.5 times in SL) than *C. rhodopensis* (5.3-6.7 times in SL).

Exept for the characters N 2, 3, 4, 5, 9, 11 and 12, given in table 2, *C. rhodopensis* differs from *C. peshevi* (and also from *C. trichonica*) by distinct sexual dimorfism of the barbels: only in the males of *C. rhodopensis* the third pair of barbels reach the vertical of the middle of the eye, while in the females they do not even reach the vertical from the beginning of the eye. *C. rhodopensis* has shorter preventral distance and larger body depth (AV-51.5 %, H-16.05 % to SL) than *C. peshevi* (AV-53.56 %, H-14.42 % to SL). *C. rhodopensis* has also longer interorbital distance and larger diameter of eye (io-18.94 %, o-17.48 % to IC) than *C. peshevi* (io-15.80 %, o-15.30 % to IC). *C. rhodopensis* has a lower number of vertebrae (39-41) than *C. peshevi* (40-43).

Comparison of *C. rhodopensis* and *C. peshevi* (according to data of Sivkov & Dobrovolov 1986) by 8 meristic and 16 metric characteristics shows 15 reliable differences using the t-criterion of Student (D, A, P, V, sp. br., vt., IC, H, PD, AV, lc, IP, IV, o, io) and two differences using CD of Mair. Using the last criterion, *C. rhodopensis* differs from *C. peshevi* in the number of vertebrae (CD=1.40), and in the preventral distance (CD=1,31).

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