©Naturhistorisches Museum Wien, download unter www.biologiezentrum.at

Ann. Naturhist. Mus. Wien	109 B	67 - 72	Wien, März 2008

The type of *Gobius semilunaris* HECKEL, 1837 (Teleostei: Gobiidae)

H. Ahnelt* & E. Mikschi**

Abstract

In the early 19th century Johann Jakob Heckel described a new freshwater goby, *Gobius semilunaris*, from Southeast Europe. It was long placed in the synonymy of *Gobius marmoratus*, a species today referred to the Ponto-Caspian genus *Proterorhinus*. Recently published molecular data appear to show that *Gobius semilunaris* is probably possibly a good species. But various contradicting information is published for the types of *Gobius semilunaris*. This concerns the date of publication and the status of the type. To avoid nomenclatorial problems we give new information on the specimens investigated by Heckel and identify the holotype for *Gobius semilunaris*.

Key words: Gobiidae, *Gobius semilunaris*, *Proterorhinus*, date of description, type.

Zusammenfassung

Gobius semilunaris wurde im frühen 19ten Jahrhundert von Johann Jakob Heckel als eine neue Gobiidenart aus Südost-Europa beschrieben. Schon bald wurde die Gültigkeit dieser Art angezweifelt und *Gobius semilunaris* in die Synonymie von *Gobius marmoratus* gestellt, einer Art, die heute der ponto-kaspischen Gattung *Proterorhinus* zugeordnet wird. Vermutlich deshalb wurde den unterschiedlichen Literaturangaben zum Erscheinungsjahr der Erstbeschreibung von *Gobius semilunaris,* sowie divergierenden Anmerkungen zum Status des Typus wenig Bedeutung beigemessen. Molekularbiologische Daten einer kürzlich veröffentlichten Studie weisen darauf hin, dass *Gobius semilunaris* eine gut definierte, eigenständige Art sein könnte. Um möglichen nomenklatorischen Problemen vorzubeugen, wird der Holotypus für *Gobius semilunaris* identifiziert.

Introduction

Gobius semilunaris HECKEL, 1837 was considered a synonym of *Gobius marmoratus* PALLAS, 1814 (now placed in the genus *Proterorhinus* SMITT, 1900) by many authors (for instance KOELBL 1874, BORCEA 1934, BERG 1949, KOTTELAT 1997, PINCHUK & al. 2004) although some authors considered this species as valid different or as a valid subspecies of *G. marmoratus* (SMITT 1899, DRENSKY 1930).

Based on the genetic variability of several pontic populations of *P. marmoratus* (PALLAS, 1814) the name *G. semilunaris* (as *P. semilunaris*) was recently resurrected (STEPIEN & TUMEO 2006). To avoid possible nomenclatorial problems it seems to be necessary to clarify the status of the type of *G. semilunaris* which are attributed in the literature with

Harald Ahnelt, Department of Theoretical Biology, Faculty of Life Sciences, University of Vienna, Althanstrasse 14, 1090 Vienna, Austria. – e-mail: harald.ahnelt@univie.ac.at

** Ernst Mikschi, Natural History Museum of Vienna, Burgring 7, A-1010 Vienna, Austria.

 ©Naturhistorisches Museum Wien, download unter www.biologiezentrum.at

different date of publication and with different type status (BORCEA 1934, BERG 1949, KOTTELAT 1997, ESCHMEYER 1998, PINCHUK & al. 2004).

Material and Methods

Gobius semilunaris, NMW 58144:1. Holotype, female, 38.8 mm SL. Turkey [now Bulgaria], River Marizza at Philippopl [Philippopolis, now Plovdiv]. Acquisition 1837. II. 5. NMW 58144:2-3, 2 females, 37.2 – 37.7 mm SL, otherwise same data.

Results and Discussion

Time of arrival of the specimens at the museum of Vienna

In November 1836 a collection of freshwater fishes arrived at the k.k. Hof-Naturalien-Kabinett of Vienna, now the Natural History Museum of Vienna (NMW). This sample was registered as the second acquisition in 1837 by Josef Natterer and by Johann Jacob Heckel. At the fifth position (1837.II.5) Heckel lists three gobies indicating a „new species", under the name „*Gobius quadrifasciatus* var. *semilunaris*" The specimens are preserved in ethanol (Fig. 1). The accompanying original label of Heckel is illegible but an additional label from Franz Steindachner, who followed Heckel as curator of fishes, gives following data: River Marizza, Turkey [now Bulgaria], 1837.II.5. Obviously Heckel based the description of *G. semilunaris* on at least one of these three specimens.

Date of publication

Gobius semilunaris HECKEL was described in the second volume of the Annalen des Wiener Museums der Naturgeschichte (in the following as AWMN). Interestingly two different years are repeatedly given as date of publication, 1837 (e.g. BORCEA 1934, KOTTELAT 1997, ESCHMEYER & al. 1998, STEPIEN & TUMEO 2006) and 1840 (BERG 1949, BANARESCU 1964, PINCHUK & al. 2004).

The AWMN was a short living journal. Only two volumes have been published, the first 1836, the second 1840 (HAUER 1886, PESTA 1939, GAAL & VITEK 1998). Two publications of Heckel are included in the second volume, the „Ichthyologische Beiträge zu den Familien der Cottoiden, Scorpaeniden, Gobioiden und Cyprinoiden" (in the following „Ichthyologische Beiträge") and „Johann Natterer's Flussfische Brasilien's nach den Beobachtungen und Mittheilungen des Entdeckers beschrieben (Erste Abtheilung: die Labroiden)" Curiously these two papers, both published in the second volume of the AWMN, are repeatedly cited with different date. Generally 1837 is given as year of publication for the new Heckel-species of the first paper, the „Ichthyologische Beiträge", like for instance for *Cottus poecilopus* or *Cottus microstomus*, and 1840 for the new species of the second paper, for instance *Heros friedrichsthalii* or *Crenichichla macrophthalma* (BANARESCU 1964, KOTTELAT 1997, ESCHMEYER & al.1998, KULLANDER & al. 1992.

Despite several publications which mention 1840 for the second volume of the AWMN (HAUER 1886, PESTA 1939, GAAL & VITEK 1998) this volume is seemingly a compilation of several parts published between 1837 and 1840. There is strong evidence that the first part, including Heckel's „Ichthyologische Beiträge", was published in 1837.

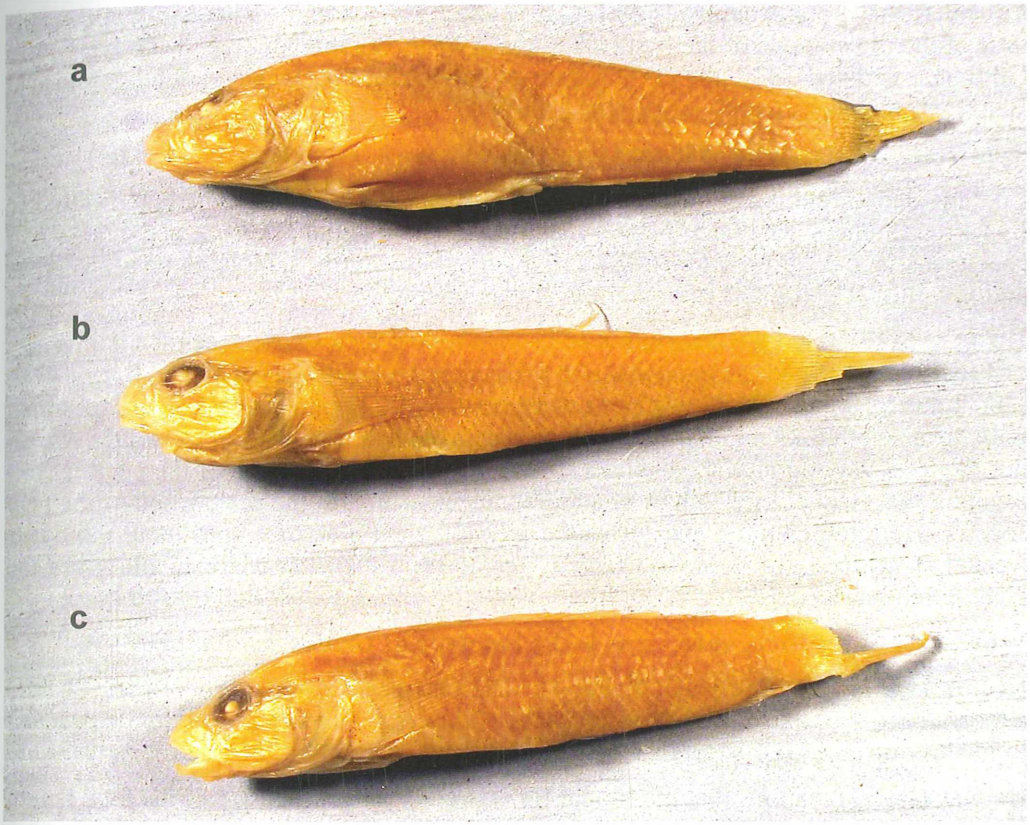

Fig. 1: The specimens of *Gobius semilunaris* HECKEL 1837. **a:** NMW 58144:1, holotype, female, 38.8 mm SL; **b** and **c**: NMW 58144:2-3, 2 females, 37.2 – 37.7 mm.

OKEN (1838) gives a brief summary of the publications in the „AWMN 1837. II.1.4." and enumerates the names of the new taxa described by Heckel, among others *G. semilunaris*. No diagnostic information goes with this name. The second publication of Heckel, „Johann Natterers's Flussfische Brasilien's", is not listed. NORDMANN (1840) cites the description of *G. semilunaris* as „Wiener Annalen, vol. II, sect.1, 1837, p. 152, pl. 8, fig. 5-6".

All together 12 publications, consecutively listed by the roman numerals I – XII, are mentioned in the list of contents of the AWMN, volume 2, 1840 with the numeral IV for Heckel's „Ichthyologische Beiträge". The first six publications are listed by OKEN (1938) with Heckel's „Ichthyologische Beiträge" as „1837.II.1.4.": 1837 for the year of publication, II for volume 2, 1 for part 1 and 4 for the fourth publication listed in the content of the AWMN, Heckel's „Ichthyologische Beiträge".

Additionally the Library of the University of Göttingen houses a volume of the illustrations of the first part of the AWMN including those of the „Ichthyologische Beiträge" of Heckel. The title page of this volume includes the content of the first part („1. Abtheilung"), lists the first six publications and is dated 1837 (information by the Niedersächsische Staats- und Universitätsbibliothek, 16 August 2007).

 ©Naturhistorisches Museum Wien

Considering the publications of OKEN (1838) and NORDMANN (1840) and that the volume of the illustrations of the first part of the AWMN at the library of the University of Göttingen is dated 1837, the correct date of publication of Heckel's „Ichthyologische Beiträge" and consequently of *G. semilunaris* is 1837.

Type status of the three specimens

Like the date of publication also the type status of *G. semilunaris* is treated differently by various authors. KOTTELAT (1997) mentions a holotype not referring to the other two specimens of the series, ESCHMEYER (1998) treats the entire sample as three syntypes and PINCHUK & al. (2004) refer them as 'type material'

HECKEL (1837) based the description of *G. semilunaris* on a single specimen with a size of 1 inch, 10 lines. Measuring units used by Heckel were Viennese inch and lines, 1 inch (26.34 mm), 10 lines (21.95 mm) and correspond to 48.29 mm. Therefore the specimen with the size of 48.29 mm has to be addressed as the holotype of *G. semilunaris*. We do not interpret varying meristic characters (number of scales and rays of the pectoral fin) as a hint that Heckel used values of additional specimens for the description of the new species. He often counted and measured left and right side of a specimen, moreover Heckel states that „the described *Gobius*" came from the river Marizza and gives the „length of the specimen"

Which one of the three specimens is the holotype of *Gobius semilunaris*?

HECKEL (1837) gives a series of diagnostic data like meristic and morphometric characters, and also the sex of the holotype. In the following we compare suitable characters to identify the holotype of *G. semilunaris*.

HECKEL (1837) mentions that the caudal fin is slightly longer than 1/6 of the total length (48.29 mm) which corresponds to 8.1 mm. But in all three specimens the caudal fins are damaged. The standard length of the specimens is 37.2 mm, 37.7 mm and 38.8 mm. Generally the caudal fins of *P. marmoratus* of 37 - 39 mm SL are 9.5 - 10 mm long (AHNELT unpublished). It is therefore justified to assume that the length of the caudal fin of the largest specimen (38.8 mm SL) was 9.2 - 9.5 mm. Supposing a slight shrinking during the long preservation the largest of the three specimens fits well to the size of the holotype. Even considering a length of 10 mm for the caudal fin, the two smaller specimens (37.2 and 37.7 mm respectively) distinctly miss the total length of 48.29 mm.

Not all meristic characters can be used to determine the holotype. For instance Heckel's values for the pectoral fin rays are 13 - 14, but all three specimens have 15 rays in these fins. Also the numbers of the fin rays of the second dorsal, the anal and the caudal fin are no indication as to which of the specimens is the holotype. The values for the anal (14 rays) and the caudal (16 rays) fin of the largest specimen are in accordance with Heckel's data but not those of the second dorsal fin (17 vs 18 rays of Heckel). Similar differences in the numbers of scales in lateral series consequently make them no useful characters for holotype determination. This is the same for the sex mentioned by Heckel. He supposed to describe a male. But the three specimens are all females. Additionally, Heckel's figures show the urogenital papilla of a female.

Obviously the most useful character to determine the holotype is the size of the three specimens. In all likelihood Heckel based his description of *G. semilunaris* on the largest

specimen. We address this specimen as the holotype (NMW 58144:1) and the two other specimens as non type material (NMW 58144:2-3).

Finally it has to be noted that HECKEL (1837) mentions two nasal openings but no nasal tubes. These tubes, also not shown in the figures of the description, are important diagnostic features for the genus *Proterorhinus* and bear the anterior nasal openings. Generally the specimens are not in good condition. Nevertheless we found the characteristic nasal tubes in all three specimens, but they are bent ventrally and are pressed against the tip of the snout. Obviously Heckel overlooked these tubes and misidentified the anterior pore of the supraorbital canal of the head lateral-line system as the anterior nasal opening. PALLAS (1814) and NORDMANN (1840) also overlooked these tubes. KRIESCH (1873) identified them as barbles and also addressed the anterior pore of the supraorbital canal as the anterior nasal opening. Further investigations will have to clarify the question, in which Genus *semilunaris* has to be placed.

Conclusion

From the above mentioned data we deduce that

the correct date of publication of the original description of *Gobius semilunaris* HECKEL is 1837;

very likely the description of *G. semilunaris* is based on the largest of three specimens;

the largest specimen is therefore identified as the holotype of *G. semilunaris* (NMW 58144:1) and the two other specimens as non types (NMW 58144:2-3).

Acknowledgements

We are indebted to C. Pfordt (Niedersächsische Staats- und Universitätsbibliothek, Göttingen) for providing valuable information for the date of publication of the AWMN. We thank H. Wellendorf (NMW) for his assistance with the photographs.

Literature

BANARESCU P., 1964: Pisces-Osteichthyes. Fauna Republicii Populare Romine Vol. XIII. – Academiei Republicii Populare Romine. 963 pp. – Bukarest.

BERG L.S., 1949: Freshwater fishes of the U.S.S.R. and adjacent countries. 3: 929-1381. – Izdatel'vesto Akademii Nauk SSSR, Moscow, Leningrad (In Russian, translated by the Israel Program for Scientific Translations, Jerusalem, 1965).

BORCEA I., 1934: Révision systematique et distribution géographique des gobiidés de la Mer Noire et particulièrement des eaux Roumaines. – Ann. Sci. Univ. Jassy 19: 1-231.

DRENSKY P., 1930: Zur Kenntnis der Süßwasserfische Bulgariens. – Zoologische Jahrbücher, Systematik 59: 663-680.

ESCHMEYER W.N., FERRARIS C.J., HOANG M.D. & LONG D.J., 1998: Species of Fishes. – In: ESCHMEYER W.N. (ed): Catalog of Fishes, 1-2: 25-1820. California Academy of Sciences, San Francisco (htttp://calacademy/org/research/ichthyology/catalog, version June 19, 2007).

GAAL S. & VITEK E., 1998: Die Publikationsreihen des Naturhistorischen Museums in Wien. – Annalen des Naturhistorischen Museums Wien, B, 100: 11-14.

©Naturhistorisches Museum Wien, download unter www.biologiezentrum.at

HAUER F. v., 1886: Vorwort. – Annalen des k.k. Naturhistorischen Museums 1: V-VI.

HECKEL J., 1837: Ichthyologische Beiträge zu den Familien der Cottoiden, Scorpaenoiden, Gobioiden und Cyprinoiden. – Analen des Wiener Museums für Naturgeschichte 2/1: 143-164.

KOELBL C., 1874: Über die Identität des *Gobius semilunaris* HECK. und *G. rubromaculatus* KRIESCH mit *G. marmoratus* PALLAS. – Verhandlungen der Zoologisch-botanischen Gesellschaft Wien 24: 569-574.

KOTTELAT M., 1997: European freshwater fishes. – Biologia 52/Suppl.5: 1-271.

KRIESCH J., 1873: Ein neuer *Gobius*. – Verhandlungen der Zoologisch-botanischen Gesellschaft Wien 23: 369-376.

KULLANDER S.O., ROYERO R. & TAPHORN D.C., 1992: Two new species of *Geophagus* (Teleostei: Cichlidae) from the Orinoco drainage in Venezuela. – Ichthyol. Explor. Freshwaters 11: 359-375.

NORDMANN A. v., 1840: Observations sur la fauna pontique. – In: DEMIDOFF A. de (ed.): Voyage dans la Russie méridional et la Crimé, Vol. III: 353-653. Paris

OKEN L. 1838. Summary of the Annalen des Wiener Museums der Naturgeschichte, herausgegeben von der Direction desselben. – Wien: Rohrmann. 1837.II.1.4. 187. 11 Tafeln. Isis 1838: 345-347.

PESTA, O. 1939: Fünfzig Jahre Naturhistorisches Museum Wien. – Ann. Naturhist. Mus. Wien 50: VII-XXII.

PINCHUK V.I., VASLI'EVA E.D., VASIL'EV V.P. & MILLER P.J., 2004. *Proterorhinus marmoratus* (Pallas, 1814). – In: MILLER P.J (ed.): The freshwater fishes of Europe, Vol. 8/II: 72-93. AULA: Wiebelsheim.

SMITT F.A., 1900: Preliminary notes on the arrangement of the genus *Gobius*, with an enumeration of its European species. – Öfvers. Kongl. Vet.-Akad. Förh. 56: 543-555.

STEPIEN C.A. & TUMEO M.A., 2006: Invasion genetics of Ponto-Caspian gobies in the Great lakes: a 'cryptic' species, absence of founder effect, and comparative risk analysis. – Biol. Inv. 18: 61-78.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Annalen des Naturhistorischen Museums in Wien

Jahr/Year: 2007

Band/Volume: 109B

Autor(en)/Author(s): Ahnelt Harald, Mikschi Ernst

Artikel/Article: The types of Gobius semilunaris Heckel 1837 (Teleostei: Gobiidae). 67-72