

The Nomenclature of *Trichopodus pectoralis* REGAN, 1910; *Trichopus cantoris* SAUVAGE, 1884 and *Osphronemus saigonensis* BORODIN, 1930 (Teleostei: Peciformes: Osphronemidae)

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Received on August 21, 2008, accepted on March 31, 2009.
Published online at www.vertebrate-zoology.de on May 15, 2009.

> Abstract

The Snake-Skin Gourami was described twice: First by GÜNTHER (1861) as *Osphromenus* (sic!) *trichopterus* var. *β cantoris*. The name was used partly up to the early twenties of the last century. But already in 1905 KÖHLER elevated that taxon on species level as *Osphromenus cantoris*. REGAN (1910) described the same species again as *Trichopodus pectoralis*. Both authors (GÜNTHER and REGAN) stressed different (nuptial and non nuptial) colour pattern of the species. As *Trichogaster pectoralis* (REGAN, 1910) the species was known lasting for decades. With the newly reinstatement of the genus name *Trichopodus* for the Southeast Asian gourami species *trichopterus*, *microlepis*, *leerii* and *cantis* the oldest name available for the Snake-Skin Gourami is *Trichopodus cantoris* (GÜNTHER, 1861). *Trichopus cantoris* SAUVAGE, 1884 is most probably a junior synonym of *Trichopodus leerii* (BLEEKER, 1852), while *Osphronemus* (sic!) *saigonensis* BORODIN, 1930 is without question a junior synonym of *Trichopodus cantoris* (GÜNTHER, 1861).

> Kurzfassung

Der Schaufelfadenfisch wurde zweimal wissenschaftlich beschrieben: Zuerst von GÜNTHER (1861) als *Osphromenus* (sic!) *trichopterus* var. *β cantoris*. Dieser Name wurde teilweise bis in die frühen zwanziger Jahre des letzten Jahrhunderts benutzt. Jedoch bereits 1905 hatte KÖHLER das Taxon als *Osphromenus cantoris* auf Artniveau angehoben. REGAN (1910) beschrieb die gleiche Art erneut als *Trichopodus pectoralis*. Beide Autoren (GÜNTHER und REGAN) betonten unterschiedliche (stimmungsabhängige) Färbungsmuster. Als *Trichogaster pectoralis* war der Schaufelfadenfisch in den letzten Jahrzehnten bekannt. Mit der Wiedereinführung des alten Gattungsnamens *Trichopodus* für die südostasiatischen (hinterindischen) Fadenfischarten *trichopterus*, *microlepis*, *leerii* und *pectoralis* bzw. *cantis* lautet der älteste verfügbare Name für den Schaufelfadenfisch nun *Trichopodus cantoris* (GÜNTHER, 1861). *Trichopus cantoris* SAUVAGE, 1884 ist sehr wahrscheinlich ein Juniorsynonym zu *Trichopodus leerii* (BLEEKER, 1852), während es sich bei *Osphronemus* (sic!) *saigonensis* BORODIN, 1930 zweifellos um ein Juniorsynonym zu *Trichopodus cantoris* (GÜNTHER, 1861) handelt.

> Key words

Nomenclature, *Trichopodus*, *Trichogaster*, Snake-Skin Gourami, Osphronemidae.

Introduction

Only four species are so far known of the South-east Asian genus *Trichopodus* LACEPÈDE, 1801: *Trichopodus trichopterus* (PALLAS, 1770) (not 1777, as often wrongly quoted); *Trichopodus leerii* (BLEEKER, 1852); *Trichopodus microlepis* (GÜNTHER, 1861) and *Trichopodus pectoralis* REGAN, 1910. With 150 up to 180 mm TL the last species is the biggest. In their home country all species are caught for everyday consumption and furthermore are considered well-known aquarium fish. In its original range (South Vietnam,

Thailand, and Malayan Peninsula) *Trichopodus pectoralis* is also grown in ponds and paddy fields. There were also undertaken several artificial, partly successful introduction attempts in other countries (South China [Hong Kong], Sri Lanka, Indonesia, The Philippines, New Caledonia, Papua New Guinea, Pakistan, Japan und Columbia) (SMITH, 1945; WELCOME, 1988).

In contrast to the economic interest in the Snake-Skin Gourami, its identification as a discrete species and its nomenclature, however, seemed difficult. In the following the nomenclature of the Snake-Skin Gourami will be explained and commented and the status of two other taxa is discussed.

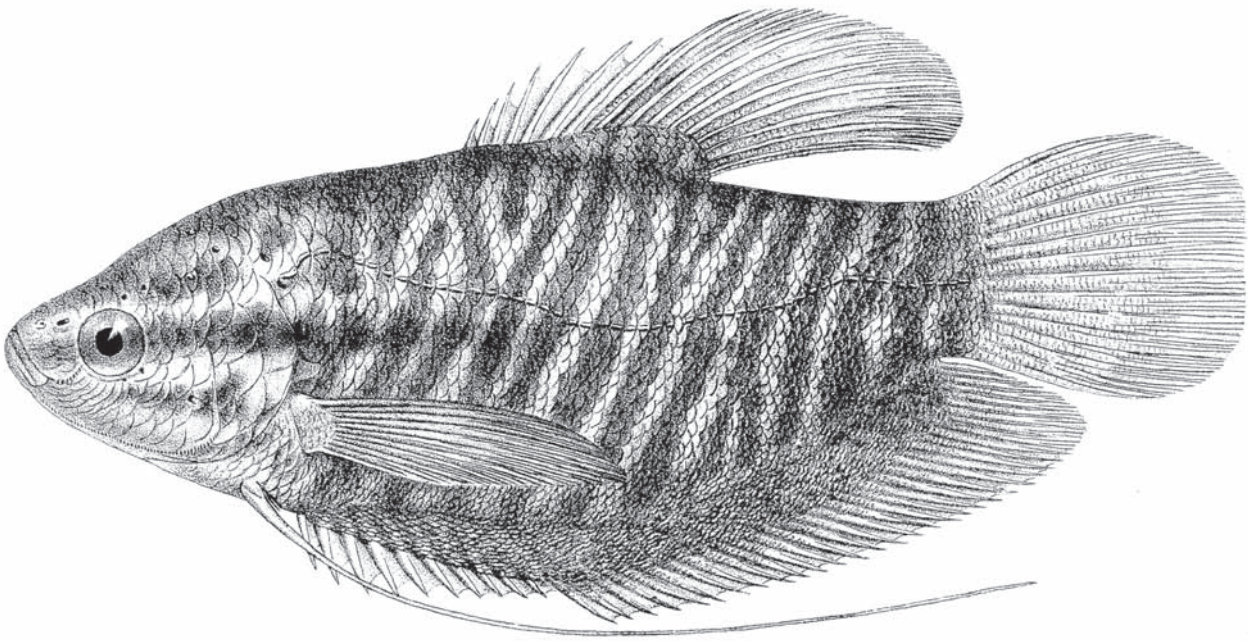


Fig. 1. *Trichopus pectoralis*, according to REGAN (1910), Image LXXIX, Fig. 1 with dominant pattern of oblique bars.

The most important features of the Snake-Skin Gourami in comparison to the other three *Trichopus* species

There are two old basic pattern in the colouration of the Southeast Asian gourami, which very probably originated during the phylogenesis of the species of the genera *Trichopus* and which can be assumed as plesiomorph. On the one hand, it is a blackish, longitudinal band starting from the mouth towards the eye down to the caudal peduncle. On the other hand there is a pattern of dark, oblique bars, often with silver shining gaps (best depicted in REGAN, [1910] Image LXXIX, Fig. 1), covering the whole body and parts of the median fins.

These two features are not similarly distinct in all four species and can, when occurring in a species, superimpose each other more or less strongly and thus change the appearance of the respective individuals (Miller & Robison 1974). They also play a significant role in the verbal descriptions of the Three-Spot and Snake-Skin Gourami, and they are an important reason for the double description of the latter by GÜNTHER (1861) and REGAN (1910).

Trichopus microlepis (GÜNTHER, 1861), the species with most apomorphic features is nearly monochrome greenish silver-coloured apart from red portions on the ventral fins, the front part of the anal fin and in the iris. It hardly ever, respectively temporarily, has the black longitudinal band, whereas the pattern of oblique bars

does not occur at all. In contrast to the other species of the genus, its forehead often is saddle-shaped dented. *Trichopus leerii* (BLEEKER, 1852) only has the black longitudinal band which can develop into a black spot on the caudal peduncle. Instead of the oblique bars, this species possesses a mosaic of light silvery spots which are dark-outlined and stretch over the whole body, the dorsal fin, anal fin and caudal fin. In the males, each ray in the posterior part of the anal fin terminating in a short silvery filament; breast, ventral fins and the front part of the anal fin are of a strong brick-red (all this being evidence indicating that SAUVAGE [1884] and partly also CANTOR [1850] dealt with this species). In *Trichopus trichopterus* (PALLAS, 1770) the black longitudinal band is reduced to two round black spots in the middle of the body and on the caudal peduncle, the dark pattern of oblique bars is temporarily quite distinctive (except in some breeding forms). In *Trichopus pectoralis* (REGAN, 1910) one finds both, the black longitudinal band as well as the pattern of oblique bars, more or less distinct according to the respective psychological condition (KÖHLER, 1905; MILLER & ROBISON, 1974). It is important for the history of the nomenclature of the Snake-Skin Gourami that GÜNTHER (1861) emphasized the existence of the black longitudinal band in his description of the variety β *cantis*, of which he thought as an occasionally existing connection between the two “*trichopterus* points”. REGAN’S (1910) eye was more caught by the oblique bars of his specimens, which led him to emphasize these more.

Selected meristic data of the *Trichopus* species after REGAN (1910):



Fig. 2. *Trichopodus pectoralis* with dominant longitudinal band (Photo: PAEPKE).

T. trichopterus: D VI–VIII/8–9; A X–XII/33–37;
L.lat. 30–40; upper lateral line series 40–52.

T. pectoralis: D VII/10–11; A IX–XI/36–38;
L.lat. 42–47; upper lateral line series 55–63; P longer than head

T. microlepis: D III–IV/8–10; A X–II/ 34–39;
L.lat. 35–42; upper lateral line series 58–65; P longer than head

T. leerii: D V–VII/8–10; A XII–XIV/25–30;
L.lat. 30–36; upper lateral line series 44–50.

Chronology of the Nomenclature of the Snake-Skin Gourami

(1) The first scientific reference of the Snake-Skin Gourami can be traced to the English doctor and natural scientist THEODOR CANTOR (1850). In his comprehensive “Catalogue of the Malayan Fishes” CANTOR described a series of freshwater Gourami from Pinang, the Malayan Peninsula, the Moluccas, Madura and Java using the name *Trichopodus trichopterus* (PALLAS, 1770). He gave a list of synonyms all referring to the species first scientifically valid described by PALLAS. Their significant features as a whole do by no means agree with the appearance of a typical *Trichopodus trichopterus*. In fact, they also refer to (at least) two species that had not yet been described then:

to the Pearl Gourami, described by BLEEKER (1852) as *Trichopus leerii* (CANTOR: „...all scales iridescent, edged with reddish brown forming an irregular network...dorsal spines and rays whitish grey, their membrane dark grey with numerous white rounded spots; caudal membrane and rays like the dorsal; anal spines carmine, their membrane and rays whitish, each ray terminating in a short silvery filament...“); and to the Snake-Skin Gourami, described by GÜNTHER in 1861 as *Osphromenus trichopterus* var. β *cantoris* (CANTOR: „...from the angle of the mouth through the iris, below the silvery lateral line to the root of the caudal a black zigzag band, widening at the termination into a large spot...“). This zigzag band is a clear indication for the Snake-Skin Gourami because the Pearl Gourami’s longitudinal band does not have a zigzag form. The meristic and other anatomical data of CANTOR (1850) are less helpful because of the interference of the respective features.

(2) ALBERT GÜNTHER (1861) was the first ichthyologist who noticed the inconsistent character of Cantor’s “*Trichopodus trichopterus*” collection. Consequently he grouped the specimens of his opinion polytypical species *trichopterus* into three varieties under the genus name *Osphromenus*: in Var. α *koelreuteri* (the actual Three-Spot Gourami, *Trichopodus trichopterus*, with the two prominent black spots in the middle of the sides of the body and the caudal peduncle; in Var. β *cantoris* (the Snake-Skin Gourami, later named *Trichopodus pectoralis* by REGAN [1910], with the temporarily appearing dark zigzag longitudinal band, etc. GÜNTHER’s description based on a skin of an adult

specimen from the CANTOR collection with the added remark “Cant. Catal.”). According to the information provided by DR. JAMES McLAINE (in lit.), this skin can unfortunately no longer be found in the ichthyological collection of the Natural History Museum of London. Finally, GÜNTHER described the Var. γ *leerii* – also based on specimen from the CANTOR collection (it meant the Pearl Gourami, *Trichopodus leerii*, in the meantime discovered by BLEEKER (1852) as new but not recognized as an independent species by GÜNTHER; also temporarily with a dark longitudinal band and – especially noted by GÜNTHER and also by CANTOR already – covered with many light silvery dark-outlined spots). Thus GÜNTHER (1861) was well able to differentiate among those species, which CANTOR (1850) then had “lumped together”, even though GÜNTHER did not allow them species level. Furthermore GÜNTHER (1861) described the Moonlight Gourami as *Osphromemus microlepis* and – completely incomprehensible for us – a *trichopterus* population from Siam as *Osphromemus siamensis*.

(3) In the years 1881 and 1884 the Frenchman H.-E. SAUVAGE mentioned three Southeast Asian gouramis of which the first two were already discovered as synonyms for the earlier described taxa: *Trichopus parvipinnis* SAUVAGE 1881 according to REGAN (1910) is *Trichopodus microlepis* (GÜNTHER, 1861), and *Trichopus siamensis* SAUVAGE 1881 according to ROBERTS (1989) is *Trichopodus trichopterus* (PALLAS, 1770). A specimen described by SAUVAGE as *Trichopus cantoris* CANT. in 1884 has not yet been identified. It originates from the lower reaches of the river Pérak in the district of Kinta on the southern Malayan Peninsula. CANTOR never named a taxon *cantis* after himself and thus SAUVAGE – possible unintentionally – became the author of the name. Perhaps SAUVAGE’s abbreviation “Cant.” referred to GÜNTHER’s variety β *cantis* of *Osphromemus trichopterus*. GÜNTHER (1861) had added the reference “Cant. Catal.”. The question is whether (a) SAUVAGE’s material was identical with what GÜNTHER defined as the *cantis* variety; or (b) being not conspecific with GÜNTHER’s var. β *cantis*? The case can no longer be examined with the object itself: probably SAUVAGE had – based on the measurements – only one specimen, but he did not denote it as a type because he referred to another author. Consequently one does not find any reference to this taxon by BLANC (1963) in the type catalogue of the Anabantoids and Snakeheads of the Museum National d’Histoire Naturelle in Paris. Eventually, PATRICE PRUVOST, the collection manager of the Paris fish collection confirmed for the author that the collection documentation does not include material collected by SAUVAGE under the name *Trichopus cantoris*. In the collection documentation, let it be understood, he did not men-

tion the collection itself. Thus we are left with the description, in which SAUVAGE explicitly emphasizes that the fish he described as *Trichopus cantoris* would not be identical with the species *trichopterus* described by PALLAS. Nevertheless, the taxon is (obvious without knowledge of its description) misleadingly mentioned in lists of synonyms of *Trichopodus trichopterus* several times, e.g. DUNCKER (1904), VIERKE (1978), RICHTER (1979) and others. The data (D. VII, 7; A. XII, 18; L. lat. 40) communicated by SAUVAGE are not definite, the data of the fin rays (D and A) as well as those of the scales on the lateral line are too low for any *Trichopodus* species. Thus only the colouration is left for identification. If one does not take the silver, hardly patterned *Trichopodus microlepis* into consideration, and disregards *Trichopodus trichopterus*, which does not fit SAUVAGE’s description and which was already eliminated by SAUVAGE, only two species remain: *Trichopodus pectoralis* and *Trichopodus leerii*. Both temporarily have a black longitudinal band SAUVAGE refers to. In the case of *Trichopodus pectoralis* it is often interrupted, respectively forms a zigzag, in the case of *Trichopodus leerii* it is rather a narrow longitudinal stripe. Some particulars speak for *Trichopodus leerii* and against the other species: thus the low TL of 65 mm, more especially several silver, dark-outlined spots or dots on the body and the base of the anal fin, which are typical of the Pearl Gourami, but do not occur in the Snake-Skin Gourami, as well as the fact that the respective species is known from Sumatra. From there BLEEKER (1852) had described his *Trichopodus leerii*. This could support the idea that *Trichopus cantoris* SAUVAGE, 1884, is a junior synonym of *Trichopodus leerii* (BLEEKER, 1852), and thus can not be identical with the GÜNTHER variety *cantis*. Perhaps someone someday discovers the Gourami mentioned by SAUVAGE in the Parisian collection and can correct this statement if necessary.

(4) In 1905 the Magdeburg schoolmaster and editor of the “Blätter für Aquarien- und Terrarienkunde” W. KÖHLER published an article titled „*Osphromemus trichopterus* (PALL.) var. *cantis* GÜNTHER“ in the above mentioned paper. However, to simplify matters KÖHLER purposefully used the term *Osphromemus cantoris* in the text eleven times without being able to estimate the nomenclatorial consequences deducible from that.

(5) In 1910 the Englishman TATE REGAN published his revision “The Asiatic Fishes of the Family Anabantidae” which for a long time would remain trend-setting. In his list of synonyms on the Three-Spot Gourami, referred to as *Trichopodus trichopterus* by him, he already pointed out that only a part of the fish attributed to this taxon by CANTOR, really corresponds to what we emphasized at the beginning. Unfortunate-

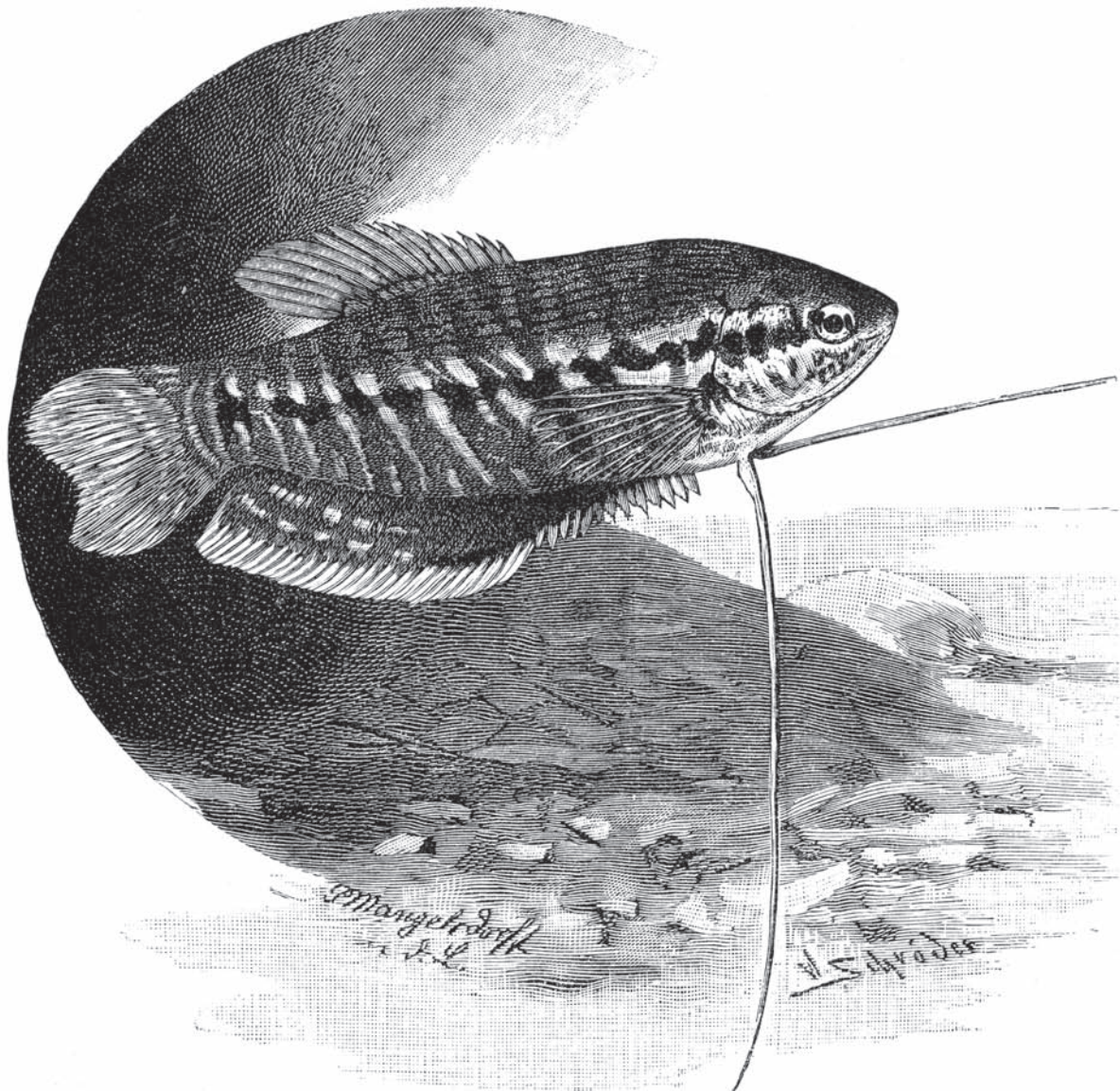


Fig. 3. Snake-Skin Gourami denominated as *Osphromenus trichopterus* var. *cantoris* from HELLER, 1908.

ly REGAN had nonetheless partly adopted the opinion of his predecessor GÜNTHER with regard to the alleged variability of the Three-Spot Gourami, *Trichopodus trichopterus*, when he assumes: "...sometimes a blackish lateral band through the spots from the eye to the caudal fin." Thus he also included the GÜNTHER variety *cantoris* in the species characteristics of *Trichopodus trichopterus*, although it definitely represents an independent species. On the basis of six relatively large specimens from Siam and Singapore he described that subsequently as the new species *Trichopodus pectoralis*. REGAN's findings show, the meristic data of *T. trichopterus* and *T. pectoralis* partly overlap, apart from the pectoral fins (head-long in *T. trichopterus*, longer than the head in *T. pectoralis*) and the upper lateral line series (40–52 in *T. trichopterus*, 55–63 in *T. pectoralis*), although this could not always be clearly verified in larger series. There remains the pattern of coloura-

tion of *T. pectoralis*, of which REGAN says: "Head and Body with oblique dark cross-bands; an interrupted lateral band from eye to caudal fin, sometimes present on the head only...". Thus REGAN had well described and pictured the different patterns of colouration of the Snake-Skin Gourami, especially emphasizing the temporal dark pattern of oblique bars. This perhaps is the reason he did not recognize the identity of GÜNTHER's *Osphromenus trichopterus* var. *cantoris* and his *Trichopodus pectoralis*.

(6) For the time being, BORODIN (1930) assigned the last scientific name for a gourami of Southeast Asia: *Osphronemus saigonensis*. The holotype was collected in 1929 near Saigon and placed in the Vanderbilt Marine Museum under the number VMM 493. Meanwhile it is situated in the American Museum of Natural History under the number AMNH 222124. According

to the combination of characteristics described, the origin, the size of 162 mm (TL?) as well as on the basis of the pictures I received courtesy of DAMARIS RODRIGUEZ, it is doubtlessly a Snake-Skin Gourami. The oblique bars mentioned by BORODIN, which had faded in 1939 already, can not be recognized anymore, the body is brownish grey without any pattern elements. On the basis of the pictures 55 resp. 56 scales could be ascertained in the upper lateral line series above the LI; nearly 49 – 50 scales in the LI, P clearly longer than the head, 3.2 times contained in the SI, head 3.8 times in the SI, relatively short, the profile of the forehead slightly convex, not at all sunken; biggest body height before D begins, 2.7 times contained in the SI; 8 D-spines, as BORODIN indicates, which is slightly high for *T. pectoralis*, but absolutely possible. By no means the fish is a *Trichopodus trichopterus*, as VI-ERKE (1978) assumed without knowing the holotype, because BORODIN emphasized repeatedly: „...absence of black spots“. Apart from these two species there are no other autochthon gouramis near Saigon.

The Usage of the species names *cantis* and *pectoralis* in the late 19th and 20th Century

In the Zoological Records there are only a few references for the usage of the name *Osphromenus trichopterus* var. β *cantis* coined by GÜNTHER (1861) in the scientific literature of the late 19th and early 20th century unfortunately, such as BLEEKER (1879) and VOLZ (1904) for example. This is different in the aquaristic literature, where the name was used by DÜRIGEN (1897), KÖHLER (1905), HELLER (1908), BRÜNING (1914), BADE (1923) and many other authors till well into the 20th century. WEBER & DE BEAUFORT (1922) had overlooked the description of *Trichopodus pectoralis* by REGAN (1910). In 1922 they still considered the Snake-Skin Gourami a variety of colouration of *Trichopodus trichopterus* (with reference to the black spots of the later they wrote: „...sometimes united by a blackish band from eye to caudal“). That was the same by CHEVEY (1932), who identified the Snake-Skin Gourami as a *Trichopodus trichopterus* in a coloured illustration as well as by RACHOW (of about 1939), in a black and white illustration. The confusion caused by REGAN (1910), who did not notice the identity of his *Trichopodus pectoralis* with GÜNTHER's *Osphromenus trichopterus* var. β *cantis*, is even fancier by KUHN (1922): she had the Snake-Skin Gourami described twice on page 207 using both names mentioned above, and depicted on

pages 206 and 207 with different images! Over time the name *Trichopodus* (later *Trichogaster*) *pectoralis* REGAN (1910) became commonly used, and from then on it was exclusively used for the Snake-Skin Gourami, as e.g. by FOWLER (1935), ARNOLD (1936), HERRE & MYERS (1937), BELDT (1942), SMITH (1945), TWEEDIE (1952), MUNRO (1955), TAKI (1974), KOTTELAT (1989), TALWAR & JHINGRAN (1992), KOTTELAT *et al.* (1993), KOTTELAT *et al.* (1995) and many others. The name *Osphromenus saigonensis* was – as far as known to the author – no longer used as a valid nomen after its coinage by BORODIN (1930).

Nomenclatorial Interpretation of the Results

The first name of nomenclatorial relevance for the Snake-Skin Gourami is *Osphromenus trichopterus* var. β *cantis* assigned by GÜNTHER (1861). According to article 45.6.4. of the ICZN it is subspecific, because before 1961 it was assigned “var.” after the binomen and because GÜNTHER did not explicitly indicate that he wanted to create an infra subspecific nomen,

The name *Trichopus cantoris* allocated by SAUVAGE (1884) can not automatically be taken as an uprating of the status first assigned by GÜNTHER (1861), because it can not conclusively be verified that it refers to the same species. It is much more likely that *Trichopus cantoris* SAUVAGE, 1884 constitutes a junior synonym to *Trichopus leerii* BLEEKER, 1852. At the same time *Trichopus cantoris* SAUVAGE, 1884 is – according to article 57.3.1. ICZN – a younger secondary homonym for *Osphromenus trichopterus* var. β *cantis*, since today both taxa are in the same genus *Trichopodus*. In both cases the name is not available.

In his article KÖHLER (1905) used the name *Osphromenus cantoris* for the Snake-Skin Gourami eleven times. Furthermore he gave a description of the appearance (especially of the ability to change the colour) and behaviour, he named parts of its artificially extended area, and he published two distinct photographs of the fish. He has thus met the formal requirements for uprating the formerly subspecies Snake-Skin Gourami to species level.

If applying the principle of priority (Article 23 ICZN) and using today's common genus name *Trichopodus* for the Southeast Asian gourami, the Snake-Skin Gourami would have to be named *Trichopodus cantoris* (GÜNTHER, 1861). The species is dedicated to the ichthyologist CANTOR. The species name *cantis* is the genitive of this noun and thus the original spelling remains (MAHNERT in lit., DUBOIS (2007), Ar-



Fig. 4. Holotype of *Osphronemus saigonensis* BORODIN, 1930 (a junior synonym of *Trichopodus cantoris* (GÜNTHER, 1861). Photo: DAMARIS RODRIGUEZ, New York.

tikel 31.1.1 ICZN). The name *Trichopodus pectoralis* REGAN, 1910 is doubtlessly a junior synonym for *Trichopodus cantoris* (GÜNTHER, 1861), as was first indicated by RIEHL & BAENSCH (1983/84)! According to the principle of priority the name *pectoralis* is invalid. Regardless of that, the status of the six syntypes of *Trichopodus pectoralis* (BMNH 1862.11.1.232–233) examined by Regan, deposited and partly available in the Natural History Museum of London, remains unaffected by the change of the name. They become even more important since the holotype for the nomen *Osphronemus trichopterus* var. β *cantis* GÜNTHER, 1861 is untraceable in the same museum.

To keep the system stable and in consideration of the economic significance of the Snake-Skin Gourami it would surely be reasonable retain the previous name *pectoralis* for that species. However, the attempt to protect it through a request to the ICZN, would probably fail in view of the evidences and a majority among the experts who in similar cases definitely favoured the principle of priority. Unless this attempt would be undertaken by exactly that majority!

Acknowledgements

JAMES MCLAIN (BMNH, London), Dr. PHILIPP KEITH and Dr. PATRICE PRUVOST (both NMNH, Paris) for providing information about the whereabouts of collection material in the Natural History Museum in London and in the National Museum for Natural History in Paris. DAMARIS RODRIGUEZ, who, after consultation with Dr. SCOTT D. SCHAEFER, sent pictures of the holotype of *Osphronemus saigonensis* BORODIN, 1930 from the AMNH New York. With Dr. MICHAEL OHL and Dr. PETER BARTSCH (both ZMB, Berlin) as well as with INGO SCHINDLER

(Berlin) I discussed nomenclatorial question, Dr. AXEL ZARSKÉ (MTD, Dresden) helped with the provision of literature and encouraged me, as did JÖRG TÖPFER, Riesa, to publish the present article. Dr. VOLKER MAHNERT (Genf) kindly reviewed the manuscript and gave helpful advises. Thank you to all colleagues and friends.

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