

Taxonomical notes on selected freshwater fish species described from northern and central Vietnam (Cypriniformes: Balitoridae, Cobitidae, Cyprinidae, Nemacheilidae; Perciformes: Channidae, Osphronemidae; Synbranchiformes: Mastacembelidae)

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Abstract: Selected, little known taxa of northern and central Vietnamese freshwater fish species are reviewed. Nomenclatural acts are taken: *Hemibarbus lehoai* is placed in synonymy of *H. maculatus*, *Paracobitis hagiangensis* in synonymy of *Schistura caudofurca*. A neotype of *Micronemacheilus bacmeensis* is assigned. The name *Channa hanamensis* is treated as a nomen nudum. Two labeonine species described from China are nomenclaturally affected: *Garra findolabium* is transferred to *Vinagarra* and its specific epithet is treated as a noun in apposition; the specific epithet of *Sinigarra napoense* is corrected to *napoensis*.

Keywords: New species; Ichthyology; Taxonomy; Nomenclature; Vietnam

The ichthyofauna of Vietnam can be well separated into a northern and a southern biome. Geographically, these biomes are split by central Vietnam's massive Annamite Range. The northern biome shares many species with South China, while the southern biome resembles species assemblages of the Indian-Malayan subcontinent. The Annamite Range itself features a high endemism rate of highly specialized species in short and steep torrential streams running eastwards into the Gulf of Tonkin.

Northern Vietnam hydrographically encompasses reaches of the Red, Pearl, Mekong, Ma, and Lam River basins, and many short coastal streams. The region is undoubtedly dominated by the Red River basin, which stretches from highlands in the Northwest through lowlands to the extensive delta at sea level in the East. The ichthyofauna of these water systems has been extensively reviewed during the past. There are basically three primordial works about the freshwater fish fauna of northern Vietnam. All of them have significantly influenced the taxonomy of fishes in the given region. These are the monographs of Mai (1978), Kottelat (2001b) and Nguyen & Ngo (2001) respectively Nguyen

(2005a, 2005b) in chronological order. Mai (1978) and Kottelat (2001b) are comparable, since they exclusively deal with northern Vietnamese freshwater and estuarine fishes, while Nguyen & Ngo (2001) and Nguyen (2005a, b) cover the ichthyofauna of entire Vietnam. Mai (1978) and Kottelat (2001b) give 201 and 268 species, respectively, including some species that were undescribed at that time. Nguyen & Doan (2008) state that the ichthyofauna of northern Vietnam has two origins: species that have spread from Yunnan and Guangxi Province, China, into Vietnam and a local origin. They provide numbers of fish species per subbasin of the Red River: 64 species and two subspecies for the Black River, the largest tributary of the Red River; 50 species and one subspecies for the Thao River (Red River stretch from Chinese border downstream to Viet Tri); 52 species and two subspecies for the Lo River, the second largest Red River tributary; and 29 species in the lower basin of the Red River. The authors emphasize a higher

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biodiversity in mountainous regions than in lowland water bodies.

In order to taxonomically and nomenclaturally review freshwater fish taxa which were recently described by Vietnamese ichthyologists from northern and central Vietnam, main repository ichthyologic collections in Hanoi were visited. Taxa listed herein may have nomenclatural relevance to the ichthyology of adjacent countries.

MATERIALS AND METHODS

Abbreviations used herein are: A=anal fin; C=caudal fin; D=dorsal fin; P=pectoral fin; V=pelvic fin; AMNH=American Museum of Natural History, New York; DVZUT=Department of Vertebrate Zoology of the Vietnam National University, Hanoi (obsolete name: University of Tong-Hop; abbreviation commonly used for the fish collection; further synonyms of DVZUT are VNUH, CRES, and NUH, all of them are in use); HNUE=Hanoi National University of Education, Hanoi (University Su Pham [from the Vietnamese Truong Dai hoc Su pham], Hanoi; Department Zoology, Faculty Pedagogy, National University, Hanoi); ICZN=International Commission on Zoological Nomenclature; IEBR=Institute of Ecology and Biological Resources, Hanoi; KIZ=Kunming Institute of Zoology, Kunming; lls=lateral line scales; LHL=Lateral head length; pds=predorsal scales; RIA 1=Research Institute for Aquaculture No. 1, Bac Ninh, Hanoi (NCNTTS I is a synonym); RIA 2=Research Institute for Aquaculture No. 2, Ho Chi Minh City; RIAH=a number code system used by Roberts & Catania (2008) for cataloguing lectotypes and neotypes stored in RIA 1, RIAH codes not maintained by RIA 1 staff.

If in the text is referred to 'the code', the international code of zoological nomenclature of the fourth edition of ICZN is meant. This edition gained effective from 2012-01-01. Diagraphs and diacritics of the Vietnamese alphabet are converted into the 26 letters of the ISO basic Latin alphabet. Counts, measurements, and terminology of morphological features follow Kottelat & Freyhof (2007), with the exception that lateral line scales are counted in total including those pored located on the caudal fin. Measurements were taken with a dial caliper to the nearest 0.1 mm. Counts and measurements were taken from the left side of a specimen whenever possible. Examinations were non-invasively. Examined specimens were stored in the repository collections of RIA 1, Kunming Institute of Zoology (CAS), China Zoological Society

DVZUT, and HNUE. Access to the specimens was gained for examination under the care of the respective collection manager.

RESULTS AND REMARKS

Major repository ichthyologic collections in northern Vietnam are RIA 1 in Bac Ninh, DVZUT, and HNUE, in Hanoi. Traditionally, specimens stored in northern Vietnamese collections nearly comprehensively originate from the lower branches of the Red River basin including specimens from its largest tributary-the Black River. A minor quantity of specimens hails from the Mekong, and the Pearl, Ma, and Lam Rivers. Fish species inhabiting water sheds located southern of the Lam River are shared between the collections of RIA 1, DVZUT, HNUE, and the collection of RIA 2 in Ho Chi Minh City. In RIA 2, there are chiefly stored specimens, which were obtained from southern Vietnam, encompassing the entire Mekong delta. The third Research Institute for Aquaculture (RIA 3) in Nha Trang in south central Khanh Hoa Province is mainly engaged in fisheries and mariculture and is lack of a freshwater fish collection.

The ichthyologic collections of RIA 1, DVZUT and HNUE were visited during beginning of April 2012. The largest collection is the one affiliated to the Research Institute for Aquaculture No. 1 in Bac Ninh, Hanoi. Unfortunately, it is widely uncatalogued with untagged specimens. It incorporates species described by Nguyen Van Hao (2005a, b). Catalogue (RIAH) numbers of lectotypes and neotypes assigned by Roberts & Catania (2008) were not maintained. It was impossible to trace back specimens using those numbers within the collection. The collection of DVZUT is catalogued, but specimens are widely untagged. It does not possess type material of recently described taxa. The majority of species described by Mai (1978) are stored in DVZUT. The small but tidy collection of HNUE keeps species described by Nguyen Huu Duc (e. g. Nguyen, 1997; Nguyen et al, 2009).

Some of the taxa evaluated in Vietnamese collections had a single type specimen, a holotype designation, while others were originally described on a base of equitable type series specimens, usually referred to as syntypes. Attempts were made to identify the holotype and type specimens that are referred to in the original description by comparing available specimens with the specimen displayed in the original description, and by reconciling SL and TL with the text in the original description.

ipation. In cases where the holotype was existent and could be unambiguously identified, it was examined, measured and photographed, provided that it was in a significant better state than accompanying paratypes. Examin-

ations performed in the collections were holotype biased, but generally focused on the best preserved type specimen.

An overview of the nomenclatural acts taken in this contribution is described in Table 1.

Table 1 Overview of the nomenclatural acts taken in this contribution

Original combination	Previous taxonomic status; references	Taxonomic status herein
<i>Hemibarbus lehoai</i> Nguyen, 2001	<i>Hemibarbus lehoai</i> Nguyen, 2001; replacement name for <i>Hemibarbus longianalis</i> Nguyen & Doan, 1969	<i>Hemibarbus maculatus</i> Bleeker, 1871
<i>Garra findolabium</i> Li et al, 2008	<i>Garra findolabium</i> Li et al, 2008; Zhang & Zhou, 2012	<i>Vinagarra findolabium</i> (Li et al, 2008)
<i>Sinigarra napoense</i> Zhang & Zhou, 2012	<i>Sinigarra napoense</i> Zhang & Zhou, 2012	<i>Sinigarra napoensis</i> Zhang & Zhou, 2012
<i>Micronemacheilus bacmeensis</i> Nguyen & Vo, 2005	<i>Traccatichthys taeniatus</i> (Pellegrin & Chevey, 1936): Kottelat, 2012 (species inquirenda)	<i>Traccatichthys bacmeensis</i> (Nguyen & Vo, 2005)
<i>Paracobitis hagiangensis</i> Nguyen, 2005	<i>Schistura hagiangensis</i> Nguyen, 2005: Kottelat, 2012 (species inquirenda)	<i>Schistura caudofurca</i> (Mai, 1978)
<i>Channa hanamensis</i> Nguyen et al, 2010	<i>Channa hanamensis</i> Nguyen et al, 2010	<i>Channa hanamensis</i> Nguyen et al, 2010 [nomen nudum]

The nomenclature of the species accounts follows the original combination. Generic relocations and synonymies are explained within the species accounts. Genera are listed in the alphabetical sequence within their family. Species are listed in the alphabetical sequence within their genus.

Cypriniformes: Balitoridae

The type material of balitorid taxa described between 2002 and 2005 and stored in RAI 1 was reported lost, viz. *Dienbienia namnuaensis* Nguyen & Nguyen, 2002; *Balitora haithanhi* Nguyen, 2005; *Balitora nigrocorpa* Nguyen, 2005; *Balitora vanlani* Nguyen, 2005; *Balitora vanlongi* Nguyen, 2005; *Beaufortia fasciolata* Nguyen, 2005; *Beaufortia multiocellata* Nguyen, 2005; *Beaufortia triocellata* Nguyen, 2005; *Hemimyzon songamensis* Nguyen, 2005; *Sinogastromyzon daon* Nguyen, 2005; *Sinogastromyzon hagiangensis* Nguyen, 2005; *Sinogastromyzon hexaocellum* Nguyen, 2005; *Sinogastromyzon hypercorpus* Nguyen, 2005; *Sinogastromyzon maon* Nguyen & Nguyen (in Nguyen, 2005); *Sinogastromyzon multiocellum* Nguyen, 2005; *Sinogastromyzon namnaensis* Nguyen, 2005; *Vanmanenia caobangensis* Nguyen, 2005; *Vanmanenia microlepis* Nguyen, 2005; *Vanmanenia monofasciodorsala* Nguyen, 2005; *Vanmanenia nahangensis* Nguyen, 2005; and *Vanmanenia trifasciodorsala* Nguyen, 2005.

Cypriniformes: Cobitidae

Cobitis ylengensis Ngo, 2003 (Figure 1)

This taxon was described based on four specimens from Yleng village, Minh Hoa District in Quang Binh

Province. This central province is chiefly drained by the coastal Gianh River. The type series has the Lot number 501 of RIA 1. It was contained in a jar and carried a clean, printed label. There were eight untagged specimens in the jar, while the original description gives four type specimens (Ngo, 2003). After evaluating the batch, one 82.7 mm SL specimen was examined, measured and photographed. Since the figure accompanied with the original description is less informative, the examined specimen is figured here (Figure 1). It could not be clarified if this specimen belongs to the type series. Kottelat (2012) treats *C. ylengensis* as a valid species, which is corroborated herein.



Figure 1 *Cobitis ylengensis*; RIA1, 82.7 mm SL, lateral, dorsal and ventral view

Cypriniformes: Cyprinidae

Hemibarbus lehoai Nguyen, 2001

Nguyen (in Nguyen & Ngo, 2001) delivers *H. lehoai* as a replacement name for *H. longianalis* Nguyen & Doan, 1969, a junior secondary homonym of *H. longianalis* Kimura, 1934, which has been commented by previous authors (Kottelat, 2001b; Roberts & Catania,

2008). Within the description, the specific epithet is also spelled *llehoai* (2001). Since the name is a dedication to Le Hoa Doan, the second author of the original description of *H. longianalis*, the spelling *lehoai* (a noun in genitive; indeclinable) is retained.

The original description of *H. lehoai* carries the figure that is used in the original description of *H. longianalis* Nguyen & Doan, 1969. The type series, that was not seen, is stored in RIA 1, Hanoi, and is based on a holotype (Lot. number H.01.48.04.01) and two paratypes (Lot. number H.01.48.04.02), which were obtained on 1965-03-15 from a stream called Nam Lay within the Black River subbasin, Muong Tung village, Muong Lay district. The province is named after Lai Chau by Nguyen, which is a correct statement for the given time. However, the city of Muong Lay was allocated to the newly created province of Dien Bien in 2004 and is located at the provincial border with Lai Chau. Considering the stream's name Nam Lay, it is believed that a river flowing northwards through Muong Lay city, a minor right bank tributary to the Black River, is meant, which entails that the type locality is located in Dien Bien Province, nowadays.

A slight discrepancy about the type locality is that the type material of *H. longianalis* was obtained from a stream called Nam Lay (Nguyen & Doan, 1969). Nguyen (in Nguyen & Ngo, 2001), however, gives the stream's name as Man Lay (for *H. lehoai*). It is a lapsus clavis as the word's diacritics show that only two letters have been shifted. In fact, the Vietnamese 'nam' with the applied diacritics simply means river. Therefore and because of an identical collection date, the new type series (three specimens) of *H. lehoai* is considered a subset of the *H. longianalis* type series (eight specimens).

Kottelat (2001b) questionably considers *H. longianalis* (= *H. lehoai*) to be a senior synonym of *H. medius* Yue, 1995. This is certainly a misidentification, since *H. lehoai* possesses a spotted body pattern and *H. medius* is spotless. Nguyen & Doan gives the key characteristics of *H. longianalis* as D II,7; P I,16; V I,8; A III,6; 45–48 lls, 6.5 scales to D origin, 5.5 scales to V origin; 5.3.1–1.3.5 pharyngeal teeth; 12 gill rakers on first branchial arch; body length 4.4–4.8 times body depth; 3.8–4.0 times head length; head length 2.5–2.7 times snout length, 3.7–4.0 times eye diameter; 3.5–4.0 times interorbital distance; upper body dark gray, belly light yellow, 9–12 black spots along lateral line. These characteristics are basically overtaken by Nguyen (in

Nguyen & Ngo, 2001). He refines the description by adding some details, such as 12–14 circumpeduncular scales for *H. lehoai*. The key to the species of *Hemibarbus* in Vietnam in Nguyen & Ngo (2001) gives diagnostic characteristics for *H. lehoai* as D and C with dark spots; SL bigger than 4 times body depth; gill rakers on first branchial arch 10–12 (in description given to exactly 12 [4+8 (2001)]); D spine weakly developed, its length shorter than LHL; A well developed, its depth longer than LHL; and interorbital distance wide (2.7 to 2.9 times in LHL). Except the slight deviation in gill rakers, there is another discrepancy hidden in the original description. The accompanying figure (2001, Figure 92) shows a specimen with an anal fin depth slightly deeper than its dorsal spine length, but inconsistent to the text, conspicuously shallower than its LHL. This characteristic requires verification via either type or topotypical material.

Nguyen & Ngo does not list *H. maculatus*, a species described from the Yangtze basin, for Vietnam and does not provide characteristics to delimit *H. lehoai* from it. This has been done by Nguyen & Doan for *H. longianalis*. The authors delimit *H. longianalis* from *H. maculatus* in having fewer lls, more gill rakers, body less deep, and anal fin rays longer. Comparing these values with the values given in the original description of *H. maculatus* it must be stated that, there are few differences between the taxa: *H. lehoai* has 45–48 lls vs. 48 in *H. maculatus*, and body length 4.4–4.8 times body depth vs. 4–4.5 times (Bleeker, 1971). Bleeker does not provide information about the number of gill rakers and the length of the anal fin rays in *H. maculatus*. Furthermore, the pharyngeal tooth formula matches exactly. Kottelat (2001a, Figure 85) provides a figure of *H. maculatus* from the Mekong basin in Laos, which closely resembles the specimen depicted by Nguyen.

The taxon *H. lehoai* is tentatively treated as a junior synonym of *H. maculatus* basing on overlapping and congruent characteristics within the respective original descriptions. If future research shows, that the Black River population is distinct from the Yangtze population and from other Red River *Hemibarbus*, *H. lehoai* would be an available name for it.

***Lissochilus aluoiensis* Nguyen, 1997 (Figure 2)**

The type series of *L. aluoiensis* was collected from A Luoi District in Thua Thien, Hue Province, Sekong River subbasin, Mekong basin, central Vietnam. It is composed of one holotype (200 mm SL) and three



Figure 2 *Poropuntius aluoiensis*, holotype, HNUE VI.1.I.21, 193.8 mm SL, lateral view

paratypes (133–140 mm SL [the SL of the largest paratype is given as 40 mm, which I consider to be an inadvertent typing error, and thus corrected it to 140 mm]). The type series is stored in HNUE. The jar containing the holotype bore the number VI.1.I.21. The specimen displayed in the original description (Nguyen, 1997; freshly dead specimen) is assumingly the holotype. It is clearly the specimen that I have examined and is depicted herein (Figure 2). It shows the damaged upper caudal fin lobe and the curved abdomen in the prepelvic portion as the specimen I have examined. I have measured its SL to 193.8 mm.

The generic name *Lissochilus* Weber & de Beaufort, 1916 is preoccupied by *Lissochilus* Pethoe, 1882 in Gastropoda Cuvier, 1797. It is a junior homonym and thus not available. Myers (1941) transferred basically all former species of *Lissochilus* to *Acrossocheilus* Oshima, 1919. *Lissochilus aluoiensis* has been placed in *Poropuntius* Smith, 1931 by Nguyen & Ngo (2001). *Poropuntius* bears the following synapomorphies: eight branched pelvic fin rays; tip and sides of the snout covered by tubercles; dark marginal stripes along both, the upper and lower lobes of the caudal fin contrasting to a hyaline or yellowish residual caudal fin; and lateral line tubes long with an accessory pore located on a ventral branch. The latter characteristic in some cases is only a few scales present or indistinct (Kottelat, 2001a; Rainboth, 1996). The specimen concerned met all characteristics with a small deviation, which the cephalic tuberculation is restricted to the tip of the snout and does not spread to along the lateral sides. Hence and objectively, the taxon should be allocated within *Poropuntius*. Kottelat (2011) uses this new combination and treats it as a valid species, meanwhile, compares *Poropuntius aluoiensis* with a potentially new species from Dakchung, Laos.

***Spinibarbus maensis* Nguyen, Duong & Tran, 2007 (Figure 3)**

The original description (Nguyen et al in Duong et



Figure 3 *Spinibarbus maensis*, holotype, HNUE, 261 mm SL, lateral view

al, 2007) of *S. maensis* bases on a holotype (256 mm SL; obtained on 2002-11-12) from Cam Thuy district, Thanh Hoa Province, Ma River (Song Ma), and on a single paratype (214 mm SL; obtained on 2004-08-10) from Huong Son district, Ha Tinh Province, Ngan Pho River (Song Ngan Pho). The first author (Nguyen HD) facilitated access to the concerned type series. The printed HNUE label (Truong Dai hoc Su pham abbreviated to Truong DHSP) affixed to the jar did not bear a catalogue number, but false locality information, date and even another binominal specific epithet. The content of the jar was confirmed to be the holotype of *S. maensis* by the first author.

Although the head of the specimen was bend at the nape in an unusual 45° angle to the right, and the abdominal cavity was opened by a longitudinal cut, the overall condition of the specimen was good. The SL of the holotype was measured to 261 mm. This may be caused by the material's bend. The concerned specimen was examined, measured, and photographed, and is depicted herein (Figure 3). It is the specimen depicted by Nguyen et al (2007), though the bend is not visible therein. The photograph in Nguyen et al (2007) must have been taken prior to preservation, most likely showing the holotype freshly dead. According to Nguyen et al (2007), *S. maensis* is distinguished by a combination of two main characteristics: a high body (2.59–2.68 times body height in SL [measured to 2.55; body height at dorsal fin origin; holotype]), and dorsal fin origin is located behind of the pelvic fin origin. In addition, it possesses 10 gill rakers on its first branchial arch; pharyngeal tooth formula: 2,3,5–5,3,2; head high and short; complete lateral line with 27–28 pored lls; and 14 circumpeduncular scales.

With the description of *S. maensis*, the number of spinibarbine fishes in the Ma River rises to three: *S. maensis*, *S. denticulatus* (Oshima, 1926), and *S. hollandi*

Oshima, 1919 (Kottelat, 2001a). *S. maensis* is herein considered a valid species of *Spinibarbus* Oshima, 1919. Synapomorphies of *Spinibarbus* are well explained in Yang & Chen (1994). The taxonomy of *Spinibarbus* is chaotic, particularly that of the Vietnamese taxa. The entity of original descriptions of *Spinibarbus* spp. of Vietnamese authors was compiled in Vietnamese language. English summaries of these descriptions are of low informative value in many instances, which makes it nearly impossible for foreign researchers to work with.

***Toxabramis maensis* Nguyen & Duong, 2006** (Figure 4)



Figure 4 *Toxabramis maensis*, paratype, HNUE, 74.8 mm SL, reversed, lateral view

This species has been described from the Ma River basin as the specific epithet implies. The original description (Nguyen & Duong in Duong et al, 2006) based on a 72 mm SL holotype and six paratypes (68–82 mm SL). The holotype and three paratypes were collected from Quan Hoa district in Thanh Hoa Province on 2003–10–18. The residual type material was collected from Thieu Hoa district in the same province on 2004–06–15. There was a printed, clean label affixed to the jar containing the type series which is placed in HNUE. There was neither a repository specimen number nor a Lot number on the label. Besides, all specimens were untagged.

T. maensis (Figure 4) is diagnosed by lls 47–50; gill rakers on the first branchial arch 45–50; and posterior edge of dorsal spine with 18–20 serrations. The herein depicted specimen is a paratype with 74.8 mm SL. Pellegrin (1932) described *T. houdemeri* from Hanoi, Red River basin. This species has also been listed by Kottelat (2001b). Another *Toxabramis* species from Hanoi, *T. hotayensis*, was described by Nguyen in 2001 (in Nguyen & Ngo, 2001). Key diagnostic characteristics to delimit the *Toxabramis* spp. in Vietnam used by Nguyen are the numbers of lls and of gill rakers on the first branchial arch. Nguyen & Ngo (2001) as well as Duong et al (2006) list *T. swinhonis* Guenther, 1873 for Kunming Institute of Zoology (CAS), China Zoological Society

Vietnam, a species restricted to the Yantze and Yellow River in China (Luo & Chen, 1998). Duong et al (2006) list *T. hoffmanni* Lin, 1934 for Vietnam for the first time. *T. maensis* is treated as a valid species.

***Toxabramis nhatleensis* Nguyen, Tran & Ta, 2006** (Figure 5)

The type series of *T. nhatleensis* was obtained from the Nhatle River, Le Thuy district in Quang Binh Province on 2004–04–30. It is composed of a 58 mm SL holotype and seven paratypes (56–72 mm SL [Nguyen, Tran & Ta in Duong et al, 2006]). The printed, clean label of the type series jar did not bear any repository number. All Specimens were untagged.

Key diagnostic features of *T. nhatleensis* are lls 39–41; gill rakers on the first branchial arch 27–35; and posterior edge of dorsal spine with 11–13 serrations. I have examined a 61.6 mm SL paratype, which is depicted herein (Figure 5). Although it is objectively a valid species within *Toxabramis*, the ventral keel in *T. nhatleensis* does not reach pectoral fin origin.



Figure 5 *Toxabramis nhatleensis*, paratype, HNUE, 61.6 mm SL, reversed, lateral view

***Vinagarra* Nguyen & Bui, 2009**

Nguyen & Bui (2009) created the new labeonine genus *Vinagarra* by monotypy; gender: feminine; type species: *Garra laichowensis* Nguyen & Doan, 1969. There were two type specimens provided in one jar labeled *Placocheilus laichowensis* (Hao & Hoa); locality: Phong Tho, Lai Chau; date: 1965–01–26. The printed label carried additionally the Lot number H.01.96.02.01(2) and the hand written, blue inked number “52”. This number may be a link to the lectotype number RIAH 1052 assigned by Roberts & Catania (2008) to a 79 mm (calculated) SL specimen. The locality and date fit to the data provided in Roberts & Catania (2008). Roberts & Catania (2008) placed *laichowensis* into *Placocheilus*, which was apparently followed by the collection manager of RIA 1 during an

inventory revision of the collection. The lot number H.01.96.02.01 indicates a holotype, but the lectotype was absent. Instead, a 73.3 mm SL paralectotype in good condition was examined (Figure 6). Nguyen & Ngo (2001) refer to a type series composed of a holotype (H.01.96.02.01) and 6 paratypes.



Figure 6 *Vinagarra laichowensis*, paralectotype, RIA 1, LC.65.01.002, 73.3 mm SL, lateral and ventral view

The translation of the original description (Nguyen & Doan, 2008) of *Garra laichowensis* mentions black stripes lined on the caudal fin, a characteristic used by Zhou et al (2005) to distinguish *Discogobio* from *Garra*. The stripes on the caudal fin and the black caudal peduncle spot as given in the translation are vanished and replaced by a monochrome brown. The specimen examined is the paralectotype H.01.96.02.02 (LC.65.01.002) as depicted in Nguyen & Bui (2009; Figure 1) readily recognized by the torn fin membrane in the lower caudal fin lobe. Its SL (Lo) was measured to 73.3 mm, while the text gives it as 74 mm. The specimen depicted in Nguyen (2008; Figure 9) differs in pectoral fin position and tubercle distribution, which stretches along the snout and infraorbitally (vs. absent infraorbitally resp. indiscernible).

Nguyen & Bui (2009) chiefly uses orostructural differences and notably small pds (1/3 to 1/2 in horizontal length relatively to lls) to delimit *Vinagarra* from other disk-bearing labeonine genera. The mandibular possesses a horseshoe-shaped distal formation anteriorly and is laterally separated by a shallow depression from the central mental disk, and the central mental disk is finely papillated. This condition strongly resembles members of *Discogobio*, except that the posterior mandibular margin is deeply notched creating two lateroposterior flaps in *Vinagarra*. These characteristics are shared with the Yunnanese Black River species *Garra findolabium*. This taxon's specific epithet is originally defined as an adjective (Li et al, 2008), but the compound word 'findolabium' is unambiguously a noun.

The corresponding adjective is 'findolabiatus, -a, -um'. Since there are no others spellings of 'findolabium' within the original description, it cannot be ascribed to an inadvertent mistake. The usage is persistent. In addition, the name 'findolabium' has been used by later authors (Zhang & Zhou, 2012). Therefore, the epithet is treated as a noun in apposition and remains unchanged. This taxon is relocated to *Vinagarra*, consequently. Its newly composed name is *V. findolabium*. The generic relocation is corroborated by Li et al (2008), who emphasize the affinities between *V. findolabium* and *V. laichowensis*. Kottelat (2013) places the taxon *findolabium* in *Garra*, but comments that a generic relocation would make sense based on orostructural differences to other members of *Garra*. There are two more labeonine taxa bearing a posteriorly notched mental disk described from China, viz., *Garra micropulvinus* and *Sinigarra napoensis* (the epithet's gender of the original spelling *napoense* as used in Zhang & Zhou [2012] is neuter. The gender of the genus is defined as feminine [Zhang & Zhou, 2012]. The specific epithet is an adjective and has to agree in gender with the genus. Hence and in accordance with the code [art. 34.2.], the epithet's ending is corrected to feminine, which is *napoensis*). Neither is ascribed to *Vinagarra*, since they differ remarkably in their orostructure. They also do not possess the notably small predorsal squamation.

The name *Vinagarra* has been spelt in multiple ways in original description: *Vingarra* and *Vinagrra*. The name *Vinagarra* is retained, since the intention of the author is evident: 'Vina' is short for Vietnam, and 'garra' is a related labionine genus. Other spellings are considered lapsus. Generic gender is feminine. Species of the genus *Vinagarra* are endemic to the middle and lower reaches of the Black River subbasin in China and Vietnam with a biodiversity hotspot in Lai Chau Province in northern Vietnam. *Vinagarra* is recognized as a valid genus within the subfamily Labeoninae, family Cyprinidae.

***Vinagarra elongata* Nguyen & Bui, 2010 (Figure 7)**

This species is described basing on a 62 mm SL holotype (LC.06.05.001) and six paratypes ranging from 61 to 69 mm SL from Tam Duong district in Lai Chau Province, northern Vietnam. This region is drained by the Nam Mu River, a Black River left bank tributary. The original description states that the type series was collected on 2006-05-20 and is stored in RIA 1. There was a



Figure 7 *Vinagarra elongata*, paratype, RIA 1, 61.4 mm SL, reversed, lateral and ventral view

yellow notepad with blue ink, hardly discernible hand writings acting as a provisional label glued on the jar containing the type series. The collection manager confirmed the jar's content to be the concerned type material. The original description is accompanied by a distorted photograph (Nguyen & Bui, 2010, Figure 1). Although the TL and SL in the figure's caption fit to the examined specimen, they do not resemble each other. It is also unclear, whether the depicted specimen is the holotype. The examined 61.4 mm SL, untagged specimen (Figure 7) was in poor condition, soft, with adpressed and torn fins, and with a cavernous visceral cavity. It is assumingly a paratype.

This species is distinguished from its congeners in having one pair of barbels vs. two pairs of barbels in *V. laichowensis*; dorsal origin closer to tip of snout than to caudal fin origin; body long and narrow (body length 8.75 (measured to 7.14) in its width and 6.44 (5.90) times in its depth vs. 4.8–4.9 times in its depth in *V. laichowensis*); head length larger than body depth; 40–43 lls vs. 38–39 lls in *V. laichowensis*; 32–35 pds vs. 28–30 pds in *V. laichowensis*; and anus covered by pelvic fins (Nguyen & Bui, 2010). It must be noted, that the position of the dorsal fin origin related to any morphologic feature (in this case the tip of snout) is a characteristic of limited diagnostic value, since the dorsal fin origin may migrate during ontogeny. Considering the comparatively small SL of the type material, it must be stated that the type specimens are juveniles. And, barbels in labeonines are usually short and therefore easily overlooked. This is even more likely to happen when the material to be examined is juvenile.

The deviating spelling *elongata* in the English summary is considered an inadvertent typing error, a lapsus calami. The original spelling *elongata* is retained. *V. elongata* is treated as a valid species within the subfamily Labeoninae, family Cyprinidae.

***Vinagarra tamduongensis* Nguyen & Bui, 2010**
(Figure 8)



Figure 8 *Vinagarra tamduongensis*, holotype, RIA 1, LC.06.05.012, 72.7 mm SL, lateral and ventral view

The type series consist of a holotype (LC.06.05.012, 74 mm SL, measured to 72.7 mm SL) and four paratypes (LC.06.05.013, 75 mm SL; LC.06.05.014, 67 mm SL; LC.06.05.015, 53 mm SL; LC.06.05.016, 62 mm SL). It is stored in RIA 1. Type material has been collected on 2006-05-15 at villages of Tac Tinh (LC.06.05.012-4) and on 2006-05-20 at Chu Va (LC.06.05.015-6), Binh Lu town in Tam Duong district in Lai Chau Province. The jar containing the concerned lots carried a provisional label similar to the one affixed to the jar of the type series of *V. elongata*. The original description depicts a distorted photograph of the holotype (Nguyen & Bui, 2010, Figure 2). This specimen is additionally shown herein (Figure 8). *V. tamduongensis* is distinguish from its congeners in one pair of barbels; body short, deep and wide (body length 4.73 (4.49) times in its depth, 6 (6.79) times in its width); head length smaller than body depth; 35–38 lls; 37–38 pds; and tip of pelvic fin reaches anus (Nguyen & Bui, 2010). *V. tamduongensis* is treated as a valid species within the subfamily Labeoninae, family Cyprinidae.

Cypriniformes: Nemacheilidae

***Micronemacheilus bacmeensis* Nguyen & Vo, 2005**
(Figure 9)



Figure 9 *Micronemacheilus bacmeensis*, neotype, RIA 1, N.01.25.001, 59.5 mm SL, lateral view, reversed

The type series of *M. bacmeensis* has been obtained from a stream called Minh Son in Bac Me County, Ha Giang Province, which is chiefly drained by the Gam River, Lo River subbasin. Collection date is 1999-05-27. It is stored in a jar with a black ink hand written label indicating that there are three specimens combined in the lot number 01.25. The lot number was added subsequently since it is hand written in blue ink. All information of the label is congruent with the data given in the original description of *M. bacmeensis*, despite the number of specimens. The description gives five type specimens. In fact, there were just two specimens in the jar during my stay at RIA 1. There was no information conveyed about the whereabouts of the missing type material. After evaluating the untagged specimens a 59.5 mm SL (74.3 mm TL) specimen was examined and photographed. It showed better condition and was slightly larger than the remaining. Nguyen & Vo (in Nguyen, 2005a) designated a 89 mm SL specimen as holotype and four paratypes ranging from 79 mm to 89 mm SL. That entails, that the original type series is entirely lost, and that the specimen photographed and measured is not part of the original type material. The depicted specimen (Figure 9) is hereby designated as neotype of *M. bacmeensis*. The RIA 1 collection number assigned to the neotype is N.01.25.001. The single paraneotype got the number N.01.25.002. Both specimens are confirmed topotypes. Detailed information about the collection date and collector are absent. The specimens remained untagged. The neotypic specimens possess a strongly faded color pattern, just as specimens that are obtained from markets and which are usually dead at the time of preservation.

Freyhof & Serov (2001) transferred all members of *Micronemacheilus* in the newly erected genus *Traccatichthys*, except *Nemacheilus cruciatus* the type species of *Micronemacheilus*, which was transferred to *Yunnanilus* as *Micronemacheilus* was placed in its synonymy. For differences between the genera see Freyhof & Serov (2001). Nguyen (2005a, key), who considers Pellegrin & Chevey's *Nemacheilus pulcher* var. *taeniata* to be a junior synonym of *T. pulcher*, basically delimits *M. bacmeensis* from *T. pulcher* by: (a) the position of the dorsal fin origin relative to the tip of snout and caudal fin base; (b) branched dorsal fin rays 12–13 (vs. 11 in *T. pulcher*); and (c) a specific papillation pattern of the lips. It is mentioned that the upper lip possesses eight papillae arranged in two rows on each side. Additionally, he gives

the tips of the caudal fin lobes as pointed in *M. Bacmeensis* vs. rounded in *T. pulcher*. This characteristic is of low value, since it is subject to environmental biotic (e. g., predators, gender and age of the specimen) and abiotic (e. g., season and related climate) factors. Also, the neotype of *M. bacmeensis* shows rounded tips. Hence, this characteristic is not further discussed herein.

The relative position of the dorsal fin origin (a) is a characteristic of low diagnostic value in nemacheilid loaches, since it may migrate during ontogeny and its position may vary depending on the sex of the specimen. This is confirmed by specimens of *Traccatichthys pulcher*: in KIZ2012000177 (53.9 mm SL) the dorsal fin origin is closer to the tip of the snout, in KIZ2012000178 (48.2 mm SL) the distances from the dorsal fin origin to the tip of snout and to the caudal fin base are equal, and in KIZ2012000185 (55.7 mm SL) the dorsal fin origin is closer to the caudal fin base. All specimens are from the east face of Tao Dao National Park, Thai Nguyen Province in northern Vietnam, which is drained by the Cau River, the next, large left bank tributary to the Red River downstream of the Lo River's influx.

Nichols & Pope (1927) give the number of dorsal fin rays (b) for *T. pulcher* to 14, branched and unbranched rays accumulated. Thus, the number of branched rays is subject to speculation and can just be confirmed after examining the holotype. The branched dorsal fin rays were counted to 13 in a batch of six specimens from the Pearl River basin in Rong'an County, Liuzhou Prefecture, Guangxi Province, China (KIZ20-1101585-90, 56.1–74.7 mm SL). Pellegrin & Chevey (1936) state 13 branched dorsal fin rays for *T. taeniatus* in the original description, while Kottelat (2001a) gives 10–13.5 and Serov et al (2006) give 10–12. The neotype of *M. bacmeensis* possesses 13 (12.5; if the penultimate and last ray are counted as 1.5 since they share one pterygiophore) branched dorsal fin rays, which is in line with the original description. The number of branched dorsal fin rays seems to be variable and partly overlapping to identical within *Traccatichthys* and, hence, proves unsuitable to distinguish *M. bacmeensis* from *T. pulcher* and *T. taeniatus*.

Labial papillation patterns are of intrinsic diagnostic value in nemacheilid loaches. As observed in the neotypic material and described by Nguyen (2005a), (c) there is a pair of large, filliform papillae centrally located and arranged in a single row on the upper lip of *M. bacmeensis*. This pair of papillae is herein referred to as

maxillary lobes. The terminus 'lobe' for oral structures is commonly used with cobitid loaches. Gapless next to the maxillary lobes there are 2–3 medium sized, fungiform papillae in a single row, seamlessly followed by two rows of around eight fungiform papillae each. These two rows of papillae reach the rictus. In front of the maxillary barbel there is a large ovoid fungiform papilla immediately at the rictus. Adjacent to the rictus on the lower lip there is an area finely plated, but not papillated, serving as a large gap between the large papilla at the rictus and three large, chunky, elongate papillae close to the center. The central pair of these chunky papillae has broadened tops and creates a deep V-formation on the lower lip. The maxillary lobes align perfectly with the three large papillae of the lower lip when the mouth is completely shut. Specimens of *T. pulcher* show a hypertrophied labial papillation pattern (KIZ201101585-90, 6 ex., KIZ2012000177-8,85, 3 ex.). They have two rows of each 8-10 medium to large fungiform papillae on the upper lip extending from the maxillary lobes towards the rictus. These papillae are rather irregularly in terms of position, shape, and size. There is a third row of tiny fungiform papillae on the upper lip close to the rictus, which is the last row prior to the buccal cavity. This row is discontinuous and reaches approximately midway from rictus to maxillary lobe. The size of papillae gradually increases from buccal cavity to upper lip margin. Irregularity of papillae increases with age. The papilla formation on the mandible basically resembles the structure of *M. bacmeensis*, but it is hypertrophied, particularly the central papilla. It often possesses multiple papillate excrescences (e. g., KIZ2011001586). The grade of hypertrophy increases with age. The mandibular gap as described for *M. bacmeensis* is present, but very narrow in *T. pulcher*. The labial papillation pattern in *T. taeniatus* (KIZ2005003157, 79.9 mm SL, KIZ2005003159, 81.6 mm SL, KIZ1991000534, 86.8 mm SL, KIZ1991000540, 92.1 mm SL, Xunjiang River subbasin, Pearl River basin, Guangxi Province, China) also differs from that found in *M. bacmeensis*, as there are two rows of medium-sized papillae spreading from the rictus to the maxillary lobes. Maxillary lobes are much less filiform than in *M. bacmeensis*. A third row of minor papillae stretches from the rictus to around midway to the symphysis. The mandibular pattern is not hypertrophied as in *T. pulcher*.

Zhu (1989, Figure 5), who also considers Pellegrin & Chevey's *taeniata* a junior synonym of *T. pulcher*,

gives 1–4 rows of papillae on the upper lip for *T. pulcher*. Zhu (1989) incorporates Hainan and Pearl River material in his analysis. The accompanied figure clearly shows *T. zispi*. Freyhof & Serov (2001) have examined the holotypes of *T. pulcher* and *T. taeniatus* and placed both in their newly erected, bitypic genus *Traccatichthys*. In this description, a single row of large papillae on the lips is given as one of the diagnostic features. Also Kottelat (2001a) defines *T. taeniatus* as having a single row of large labial papillae. The respective original descriptions of these two species concerned are silent on this issue. However, Prokofiev (2004) states two parallel rows of labial papillae for *Micronemacheilus* (= *Traccatichthys*). He allocates *Nemacheilus cruciatus* (type species of *Micronemacheilus*), *T. pulcher*, *T. taeniatus*, and *T. zispi* in *Micronemacheilus*. Unfortunately, there is no comparative material listed in this contribution and, thus, the information if type material was examined is not conveyed to the reader. The accompanied figure of the mouth structure of *T. zispi* (2004, Figure 2b) shows a too simplified structure. In fact, the labial papillae pattern is very similar to that of *M. bacmeensis*. The only slight difference is that in *T. zispi* the papillae arranged in two rows on the upper lip are subjectively larger and therefore in smaller quantity.

The herein depicted Cau River specimen of *T. pulcher* (Figure 10, KIZ2012000177, collection date: 2012-04-08) is roughly 6 mm smaller than the neotype of *M. bacmeensis*. It was preserved in a 10% formalin solution immediately after its capture in situ. It shows traces of the submarginal bands in the caudal fin that serve as specific diagnostic character of *T. pulcher*. The bands may have not been developed yet, since the specimen is adolescent and/or it may be seasonally induced. Actually considered a flaw of the original description of *M. bacmeensis*, but the gross ink pen retouchings in Nguyen's (2005a, Figure 10) figure amplify the informative value when diagnostic features are concerned. The figure clearly shows the median band in the dorsal fin and the dark, basimedial band transversely running over the pelvic fin. Both characteristics are carried by the neotypic material, but are absent in *T. taeniatus*, which possesses hyaline fins. The retouched figure also shows a hyaline caudal fin, which is lined by conspicuous, dark submarginal bands in *T. pulcher*. Characteristics of diagnostic value of *M. bacmeensis* are the patterned dorsal fin, hyaline caudal fin and the labial papillation pattern as described.



Figure 10 *Traccaticthys pulcher*, KIZ2012000177, 53.9 mm SL, lateral view

Traccaticthys pulcher possesses a minimum North-South distribution ranging from riverine water bodies within the Xunjiang River subbasin, Pearl River basin in Rong'an County, Liuzhou Prefecture, Guangxi Province, China (KIZ201101585-90) to coastal rivers in Thua Thien, Hue Province in central Vietnam (Slechtova; 2008: 155, photograph of J. Bohlen). Although it is described from Hainan Island, it does not occur on that island. Two extensive excursions to Hainan Island in 2006 and 2011 did not succeed in the recollection of *T. pulcher*. That corroborates the hypothesis of Du et al (2012) that *T. pulcher* never occurred on that island, but was brought over from China mainland and given to its describers. The only *Traccaticthys* inhabiting Hainan Island is *T. zispi*. The North-South distributional range of *T. taeniatus* is very similar. It ranges from Xunjiang River subbasin, Pearl River basin in Jinxiu County, Laibin Prefecture, Guangxi Province, China (KIZ2005003156-61, 6 ex., 54.9–86.2 mm SL) as far southern as Quang Ngai Province in central Vietnam (Serov et al, 2006). The distributional pattern of these two species is sympatric but never syntopic. There is no record of two *Traccaticthys* spp. co-occurring. Du et al (2012) mention that the specimen of *T. taeniatus* depicted in Kottelat (2001b, Figure 69) originates from the type locality of *M. bacmeensis*, which corroborates sympatry. The distributional range of *M. bacmeensis* seems to be limited to a small pocket with the upper reaches of the Gam River.

Kottelat (2012) treats this *M. bacmeensis* as a species inquirenda and places it tentatively in the synonymy of *T. taeniatus*. It surely belongs into *Traccaticthys*, but it is not a junior synonym of *T. taeniatus*. It is a valid species within *Traccaticthys* and shares characters with *T. pulcher* and *T. taeniatus*. The correct full naming for the time being is *T. bacmeensis* (Nguyen & Vo, 2005).

***Oreias hoai* Nguyen, 2005**

This taxon has been described based on a unique

holotype, which should be placed in RIA 1, but was reported lost during my presence at RIA 1. The generic name *Oreias* Sauvage 1874: 334 is preoccupied by Kaup (1829) in Aves and was replaced by Kottelat (2010) by the new name *Claea*. The taxonomic status of *Claea* (= *Oreias*) is unclear. The only potential chief diagnostic characteristic is the scaleless body which delimits it from *Schistura* McClelland, 1838. However, meanwhile there have been further scaleless species described in *Schistura*, such as *S. pseudofasciolata* Zhou & Cui, 1993. Zhu (1989) as the first put *Oreias* in synonymy of *Schistura*, which is followed herein. Kottelat uses it as a valid genus (2012). Kottelat (2009) put *O. hoai* in the synonymy of *Schistura poculi*, but later on he corrected himself and declared this species as valid within *Schistura* (Kottelat, 2012) the name being *S. hoai*.

***Oreias lineatus* Nguyen, 2005**

The type series was reported lost at RIA 1. Kottelat (2009, 2012) treats *O. lineatus* as a junior synonym of *Schistura melarancia*, and bases his decision on the retouched figure of *O. lineatus* in its original description.

***Oreias punctatus* Nguyen, 2005**

The unique holotype, that should be stored in RIA 1, was reported lost. Nguyen (2005a) described this taxon from the Nam Ngam, which is within the Mekong water shed in Dien Bien Province, Vietnam. Kottelat (2009, 2012) recognized a juvenile *Schistura athos* in the given figure of *O. punctatus* in its original description and thus put *O. punctatus* in synonymy of *S. athos*.

***Paracobitis hagiangensis* Nguyen, 2005**

This species was described from the Lo River, a major left bank tributary to the Red River in Ha Giang Province. The description was based on two specimens, which should be stored in RIA 1, but they were reported lost.

Members of the genus *Paracobitis* Bleeker, 1863 are spread over western and central Asia. Morphologically similar East Asian species widely occurring in China are allocated in the genus *Homatula* Nichols, 1925. *Homatula* is diagnosed by having a rounded caudal fin and a caudal peduncle with adipose crests along dorsal and ventral midlines. These crests are supported by rudimentary rays (Min et al, 2012). The specimen depicted by Nguyen (2005a) does not have a rounded caudal fin but a moderately emarginated caudal fin with

well rounded lobes, and it does not possess adipose crests. It should belong into the genus *Schistura* as assumed by Kottelat (2012).

During an ichthyofaunistic excursion to Wenshan Prefecture, Yunnan Province, China, I have collected a large batch of fishes including *S. callichromus*, *S. caudofurca* and *S. macrotania* from the Damahe River in Xichou County. The Damahe River is called Nho Que River in Vietnam and enters the Gam River in Cao Bang Province. The Gam and Lo Rivers are sometimes considered as Lo-Gam River system. In fact, the Gam River is by far the largest tributary to the Lo River shortly before its influx in the Red River mainchannel. Specimens of *S. caudofurca* obtained from the Damahe River possess the diagnostic key features of the specimen of *P. hagiangensis* depicted in its original description; a compact rather than elongate body, dorsal fin origin slightly in front of pelvic fin origin, caudal peduncle shape, shape of the basicaudal bar, caudal fin shape, and the color pattern of the dorsal fin featuring a thick, dark basal and a broad, light central band. In addition, *P. hagiangensis* seems to be a small sized species; the SL of the type material is only 55–61.6 mm. This size range is also common for adult specimens of *S. caudofurca*. The depicted four specimens of *S. caudofurca* of the Damahe River batch (Figure 11) are well within this range resp. slightly above. Despite the congruent size range, these four specimens are quasi devoid of a color pattern and resemble van Hao's specimen (2005) closely. Individuals of *S. caudofurca* undergo growth related ontogenetic changes in color pattern with a well developed bar

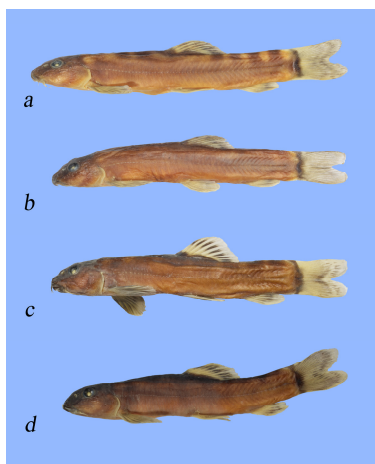


Figure 11 *Schistura caudofurca*, lateral view; a. KIZ2012004262, 62.4 mm SL, reversed; b. KIZ2012004118, 60.5 mm SL; c. KIZ2012004264, 60.4 mm SL, reversed; d. KIZ2012004263, 59.7 mm SL, reversed

pattern, the development of a broad, dark longitudinal stripe and finally an overall darkening of the body coloration. This darkening goes along with a fading of the barred flank pattern. Large specimens of *S. Caudofurca* are often devoid of a color pattern such as the specimen depicted by Nguyen (2005a). Another reason for the patternless specimen may be an improper preservation (see account of *Micronemacheilus bacmeensis*).

Unfortunately, the six extant syntypes of *Barbatula caudofurca* Mai, 1978 are devoid of any color pattern, except a dark, broad, continuous basicaudal bar (Figure 12). All other diagnostic features present in the type material are also found in the Damahe River material, and as far as I can interpret, the original description and its accompanying figure these features are also present in *P. hagiangensis*. Therefore, *P. hagiangensis* is put objectively in synonymy of *S. caudofurca*.



Figure 12 *Barbatula caudofurca*, syntype, DVZUT, 53.4 mm SL, lateral view

Paracobitis phongthoensis Nguyen, 2005

The unique holotype of *P. phongthoensis* was obtained from the Nam So in Phong Tho district in Lai Chau Province. The Na River, which drains the Phong Tho district, is the first large (left bank) tributary to the Black River on Vietnamese territory. The 57.4 mm SL holotype was reported lost during my stay at RIA 1.

The specimen depicted by Nguyen (2005a) neither has a rounded caudal fin, nor adipose crest and thus does not belong into *Homatula*, but most likely into *Schistura* as assumed by Kottelat (2012). Kottelat (2012) list *S. phongthoensis* doubtfully as a valid species - indicated by the usage of a question mark in front of the binomen. The specimen depicted by Nguyen has its dorsal fin origin right above the pelvic fin origin, and a conspicuously dark basicaudal bar reaching or nearly reaching its dorsal/ventral extremities. Of intrinsic diagnostic value is the color pattern of 13 bars, less conspicuous in the

anterior portion of the body. There are six, quite regularly set postdorsal bars, thinner than the interspaces, all reaching their counterparts at dorsal and ventral midlines. The total number of bars (13) and the fact that the postdorsal bars are interconnected over the ventral midline are a characteristic combination not described hitherto from congeners in the given zoogeographic context. The only two species, which are similar to *S. phongthoensis* and occur within the Black River subbasin, are *S. caudofurca* and *S. tamduongensis*. The maximum number of bars in *S. caudofurca* is nine (modally 8), *Schistura tamduongensis* has at most 11 bars (modally 10). Neither species has their postdorsal bars interconnected via the ventral midline.

Schistura phongthoensis Nguyen, 2005 is treated as a valid species. Due to the loss of the type material, the collection of topotypes and a subsequent designation of a neotype are required. Interestingly, a recently published monographic paper about Vietnamese *Schistura* species neither list nor mentioned this taxon (Nguyen & Nguyen, 2008).

***Schistura pumatensis* Nguyen & Nguyen, 2007**
(Figure 13)



Figure 13 *Schistura pumatensis*, lateral view; a. Holotype, PM020170, 64.2 mm SL, reversed; b. Paratype, PM020172, 57.7 mm SL

This species is described from the Khe Bu stream in the Pumat National Park, Nghe An Province. The Pumat National Park is chiefly drained by the Lam River. The HNUE placed type series consist of one holotype (PM020170; 64.2 mm SL) and five paratypes (PM020171-75; 54.8–59.6 mm SL), collected on 2006-7-12.

The original description shows a distinctively patterned holotype (Nguyen & Nguyen, 2007). However, this pattern has started fading remarkably at the time of my presence in HNUE in April 2012. Figure 13 shows the holotype PM020170 and paratype PM020172 (deviating SL measured to 57.7 mm) of *S. pumatensis*. Key

diagnostic features of *S. pumatensis* are a notched upper lip; 14–17 regularly shaped bars, slightly wider than interspaces; a single basidorsal spot located anteriorly; straight basicaudal bar not reaching extremities.

The author compared *S. pumatensis* with three allopatric congeners and a specific comparison with sympatric species such as *S. hingi* (Herre, 1934) and *S. pervagata* Kottelat, 2000 remained pending (Freyhof & Serov, 2001 [identification doubtful]). *Schistura pumatensis* has been treated as valid by Kottelat (2012), which is followed herein.

***Schistura tamduongensis* Nguyen, Nguyen & Nguyen, 2009** (Figure 14)



Figure 14 *Schistura tamduongensis*, lateral view; a. Paratype, LC.09.03.005, 60 mm SL, reversed; b. Paratype, LC.09.03.003, 50.9 mm SL

This species has been described from a stream called Ban Bo in Tam Duong district, Lai Chau Province. The Ban Bo is a minor tributary to the Mu River, a left bank affluent of the Black River in Son La Province. The holotype LC.09.03001 has a SL of 66.6 mm and was collected together with 13 paratypes (LC.09.03002-14; 20.2–61.5 mm SL). The jar containing the type series is equipped with a printed label and is stored in HNUE. The specimen depicted in the original description is not the holotype, but a paratype, LC.09.03005, 60 mm SL.

The specific epithet in descriptive text is also spelled *S. tamduongensi* (Nguyen et al, 2009). This is obviously an inadvertent error, a lapsus calami. According to the code (article 32.5.1.), the original name *S. tamduongensis* is retained. Key diagnostic characteristics of *S. tamduongensis* (Figure 14) are a notched upper lip; dorsal fin origin clearly in front of the pelvic fin origin (opposite of first to second branched dorsal fin ray); basidorsal band dissociated into two horizontally spread blotches, the first usually reaches the first branched

dorsal fin ray, the second reaches from the fourth to the seventh branched dorsal fin ray; caudal fin deeply emarginated with rounded lobes; 7–11 (modally 10) quite regularly arranged bars, predorsal bars in some specimens irregular and disconnected over the back, postdorsal bars are usually interconnected over the dorsum, but never reach ventral extremity, bars slightly thinner or equally wide than interspaces; in females anus located slightly closer towards the tip of the pelvic fin than to anal fin origin, in males pelvic fin surpasses anus; and a conspicuously broad and dark basicaudal bar, which does not reach its extremities.

The authors delimit *S. tamduongensis* towards eight *Schistura* spp., none of them inhabiting the Red River drainage. A comparison with phenotypically similar species that occur in the same basin such as *S. caudofurca* and *S. phongthoensis* is missing. Considering the combination of diagnostic characters and the zoogeographical context *S. tamduongensis* is tentatively treated as a valid species.

Perciformes: Channidae

***Channa hanamensis* Nguyen, Bui & Nguyen, 2010**
(Figure 15)



Figure 15 *Channa hanamensis*; holotype, H.Na.10.02.001, 226 mm SL, reversed, lateral view

A jar with a single channid specimen and a separate label prepared, but not yet affixed to the jar was presented at RIA 1. The printed label gave the content of the jar as follows: holotype of *C. hanamensis*; 235 mm SL (measured to 226 mm); collection number H.Na.10.02.001; collected on 2010-02-15; type locality: Tam Chuc Lake, Ba Sao town, Kim Bang district, Ha Nam Province. The specimen was untagged. The specimen H.Na.10.02.001 (Figure 15) was confirmed the only type series specimen, which makes it a unique holotype.

There has been a minimum of four type series of channid fishes in the RIA 1 collection, but all lacking proper publication in the sense of the code. Hence, the names of these 'species' are herein omitted to prevent nomina nuda. But in the case of *C. hanamensis*, a paper including a short introduction of this species (Nguyen et

al, 2010) was presented. The description therein is sparse, but it satisfies the rules of the code. It delivers specific characteristics that claim to differentiate the species (code, art. 13.1.1). However, the code's article 16.4 is violated, since there were no name-bearing types fixed in the publication. The paper concerned seems to serve as a brief introduction of this species as its last sentence refers to an original description that has already been published at the time when the introduction was compiled. However, all my Vietnamese sources in and outside of RIA 1, that do not include the authors concerned, neglected the presence of a formal original description of *C. hanamensis*. There is at least one further indication, that a formal original description exists: a research proposal stating details about the species' economic value that were apparently given in its original description (Nguyen, no date).

Key diagnostic features of *C. hanamensis* are 61 lls; 10 chevron shaped dark formations on beige ground coloration, reaching dorsal midline, last six formations reaching also ventral midline, pattern in preanal portion of body inconspicuous; a conspicuous dark, vertically elongated, ovoid basicaudal blotch; all unpaired fins with white margin; dorsal fin origin on one vertical line with the pectoral fin origin; pelvic absent; lateral head length/SL 27.3%; head depth at nape/SL 15.5%; and a deep mouth cleft. Features of the internal morphology of buccal cavity structures, vertebrate and gill raker counts were inaccessible and therefore not examined. The original description gives 55–57 vertebrae.

The origin of the *C. hanamensis* holotype is Ha Nam Province. Nguyen (2011) described *C. hoaluensis* from Hoa Lu district located in the neighbouring Ninh Binh Province. Both provinces lie in the water shed of the Day River, a major tributary of the Red River. All diagnostic features of *C. hanamensis* are basically also found in *C. hoaluensis*, of which I examined the paratype NB. 10.05.002, a 214 mm SL female (Figure 16; 223 mm SL in original description). Hence and under the provision, that a code-conform original description of *C. hanamensis* as stated by Nguyen et al (2010) and Nguyen (no date) exists, *C. hoaluensis* is objectively placed in the synonymy of *C. hanamensis*. The taxon *C. ninhbinhensis* Nguyen, 2011 superficially also resembles *C. hanamensis*, but chiefly differs in gill rakers on first arch 8–12 (vs. 4–6 in *C. hoaluensis*, a junior synonym of *C. hanamensis*), and in number of vertebrae (51–42 vs. 55–57 in *C. hanamensis*). *C. hanamensis* is distinguished

from *C. asiatica* by D origin over P origin (vs. D origin clearly posterior of P origin), 55–57 vertebrae (vs. 53), head width narrower (at eyes: 11.8% of SL vs. 13.3%–13.9% of SL; max.: 17.5% of SL vs. 18.7%–19.9% of SL), and eye diameter smaller (13.3% of LHL vs. 14.7%–15.5% of LHL). Besides there are obvious differences in the color pattern. Morphometrics and meristics for *C. asiatica* used herein were obtained from a batch of five juvenile specimens from the Zhonglianghe River, Jinxiu, Guangxi Province, China (KIZ2005014454-8, 79.9–114 mm SL).

In the absence of a code-conform original description, the name *C. hanamensis* is treated as a nomen nudum with provisions as specified herein.



Figure 16 *Channa hoaluensis*, paratype, NB. 10.05.002, 214 mm SL, lateral view

Perciformes: Osphronemidae

***Macropodus lineatus* Nguyen, Ngo & Nguyen, 2005**
(Figure 17)



Figure 17 *Macropodus lineatus*, holotype, 47.8 mm SL, reversed, lateral view

The taxon is described from five specimens, a 51.5 mm SL holotype and four paratypes ranging from 37–47 mm SL. The type location is Phong Nha-Ke Bang National Park, Quang Binh Province. The jar containing the type material, lot number 408, carried a printed label. There was a hand written collection number using blue ink on the label, P.02.01.05(5). The five in parentheses indicate the number of specimens in the jar and is congruent with the original description (Nguyen, Ngo & Nguyen in Nguyen, 2005b). However, there were only four specimens in the jar. After examining the type material, the largest specimen (47.8 mm SL) of the batch was identified to be the specimen depicted in the original description Nguyen, Ngo & Nguyen in Nguyen (2005b,

Figure 9). The holotype's SL is given to 51.5 mm, while the largest paratype has a SL of 47 mm SL Nguyen, Ngo & Nguyen in Nguyen (2005b). Assuming that the figure in the original description shows the holotype and that the SL in the original description was measured too long, as happened in all other cases and caused by a bended caudal peduncle and scales rows reaching far on the caudal fin in *M. lineatus*, the 47.8 mm is the holotype, herein depicted in Figure 17.

Nguyen (2005b) provided a key to the species of the genus *Macropodus* occurring in Vietnam. The key diagnostic characteristics of *M. lineatus* therein are an emarginated caudal fin; D XII,6–7; A XIX–XXII,11–12; 27–29 lls; and a body with 5–6 vertical bars along the axis. In addition, the dorsal fin origin is located behind the anal fin origin, and the origin of the pectoral fin is on the same vertical line as the origin of the pelvic fin. The original description comes with a grossly pen retouched figure, which is of nearly zero informative value. *M. lineatus* is treated as a valid species.

***Macropodus oligolepis* Nguyen, Ngo & Nguyen, 2005**
(Figure 18)



Figure 18 *Macropodus oligolepis*, holotype, 37.6 mm SL, lateral view

The jar of RIA 1, Lot number 406, contained a single 37.6 mm SL specimen of *M. oligolepis* (Figure 18). It carried a printed label with the in blue ink hand written collection number P.02.01.06 (2). Following the RIA 1 standard of collection numbers, this number identifies the jar content as two paratypes. According to the original description, the type series of *M. oligolepis* consists of a 38 mm SL holotype and a single 21 mm SL paratype. Hence, the located specimen is the holotype. The whereabouts of the other specimen were reportedly unknown. *M. oligolepis* is described from the Phong Nha-Ke Bang National Park in Quang Binh Province (Nguyen, Ngo & Nguyen in Nguyen, 2005b).

Key diagnostics for *M. oligolepis* are a rounded caudal fin; D XII–XIII, 5–7; A XIX–XXII, 11–12; 23–24 lls; eight narrow dark bars, all postpectoral bars reaching dorsal and ventral extremities; a dorsal fin origin slightly

behind the anal fin origin; and the origin of the pectoral fin is on the same vertical line as the origin of the pelvic fin. The number of lls in *M. oligolepis* is remarkably low and constitute the main difference towards *M. baviensis* Nguyen & Nguyen, 2005 (in Nguyen, 2005b [30-33 lls]). *M. oligolepis* is treated as a valid species.

***Macropodus phongnhaensis* Ngo, Nguyen & Nguyen, 2005 (Figure 19)**



Figure 19 *Macropodus phongnhaensis*, paratype, 38.3 mm SL, lateral view

This taxon was also described from the Phong Nha-Ke Bang National Park in Quang Binh Province. The original description (Ngo, Nguyen & Nguyen in Nguyen, 2005b) based on a 40 mm SL holotype and three 36.2–38 mm SL paratypes. A jar (RIA 1, lot number 405) with damaged printed label containing two specimens of *M. phongnhaensis* and two juvenile barbines was presented. The label bore the hand written number P.02.01.04 (4). The specimen in better condition was examined (Figure 19, 38.2 mm SL). By judging from the overall body and finnage appearance, this specimen should be the largest paratype and seems to be the specimen displayed in Nguyen (2005b). The whereabouts of the holotype were reported unknown.

M. phongnhaensis is diagnosed by an emarginated caudal fin; D XII-XIV, 5; A XVI-XVII, 11-12; 24-26 lls; a body with horizontal stripes; the dorsal fin origin in front of the anal fin origin; and pelvic fin origin clearly behind pectoral fin origin. A body pattern of horizontal stripes is unique among fishes of the genus *Macropodus*. Hence, *M. phongnhaensis* is treated as a valid species.

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There are four *Macropodus* spp. described from the Quang Binh Province: *M. lineatus*, *M. oligolepis*, *M. phongnhaensis*, and *M. erythropterus* Freyhof & Herder, 2002. The three former species were described from the Phong Nha-Ke Bang National Park, which lies in a karstic area and has an area of roughly 860 km² (Wikipedia, 2013), whereas, the latter was described from an area located around 50 km southeast of the confines of the national park. The fact, that the former three species were collected on the same day (2003-04-06) anticipates that the species occur syntopic or in close proximity. With such an uncommon, high number of congeneric species, that can be referred to as a species flock, Vietnam's Quang Binh Province and its national park have become a hotspot of macropodine speciation.

Synbranchiformes: Mastacembelidae

***Mastacembelus dienbienensis* Nguyen & Nguyen, 2005**

Type series of four specimens was reported lost at RIA 1.

***Mastacembelus thacbaensis* Nguyen & Nguyen, 2005**

The type material is reportedly lost. There was a minimum of three lots with mastacembelid type material at RIA 1, which has been or was in preparation to be published (according to the RIA 1 staff). At a first sight these species are at least in part valid species. Those names are omitted herein to prevent nomina nuda, since the RIA 1 staff and other Vietnamese sources were unable to present any related original description or any further publication information.

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