



Nomenclatural availability of putative scientific generic names applied to the South American cichlid fish *Apistogramma ramirezi* Myers & Harry, 1948 (Teleostei: Cichlidae)

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Abstract

Mikrogeophagus Meulengracht-Madsen, 1968 is the oldest available generic name that has *Apistogramma ramirezi* as type species. *Papiliochromis* Meulengracht-Madsen, 1975 is an objective junior synonym of *Mikrogeophagus*. *Papiliochromis* Kullander, 1977 is an objective junior synonym of *Mikrogeophagus* and an objective junior synonym and homonym of *Papiliochromis* Meulengracht-Madsen, 1975. The name *Microgeophagus* used in an aquarium book by Frey 1957 is a *nomen nudum* because it was not used as a valid name. Many usages of *Microgeophagus* are erroneous subsequent spellings of *Mikrogeophagus*. *Pseudogeophagus* used by Hoedeman 1969 and *Pseudoapistogramma* used by Axelrod 1971 are *nomina nuda*. *Mikrogeophagus*, *Microgeophagus*, *Pseudogeophagus*, and *Pseudoapistogramma* were proposed with a direct or inferred reference to a non-existent publication about the behaviour of *A. ramirezi*. The case of *A. ramirezi* suggests that ornamental fish magazines may be unreliable sources of nomenclatural information.

Key words: aquarium magazines, *Microgeophagus*, *Mikrogeophagus*, *Papiliochromis*, Zoological Nomenclature

Introduction

The South American cichlid fish *Apistogramma ramirezi* was described in a short notice in an ornamental fish magazine, without indication of an author (Anonymous 1948). It is likely that the author was the editor of the journal, William T. Innes, who wrote a significant part of the content of his magazine and who corresponded with fish taxonomists. The article clearly indicates George S. Myers and Robert R. Harry as authors of the name, and they are universally recognized as the formal authors of *A. ramirezi* (Robins & Bailey 1982). A formal description by Myers and Harry, based on specimens from the ornamental fish trade followed soon afterward (Myers & Harry 1948). There were concerns about inadvertent descriptions of *A. ramirezi* very early. Myers & Harry (1948) wrote that the species was already commercialized as “Ramirezi”, that they could not find any use of the name making it available, and that they used the name *ramirezi* only in order to avoid confusion. Obviously their effort was in vain.

Since then *A. ramirezi* has become an important component of the ornamental fish trade. It was used in behaviour studies (Wickler 1956a) and maintenance and spawning behaviour were also reported in ornamental fish literature (e.g., Axelrod 1971). In 1957 it was associated with a different generic appellation, *Microgeophagus*, in an aquarium book by the German aquarist and author Hans Frey (Frey 1957). This name was rarely used, but in 1971 Axelrod (1971) used *Microgeophagus* in a widely distributed popular book about breeding ornamental fishes. At about the same time, Klee (1971), in an ornamental fish magazine, published a strong rejection of *Microgeophagus* and advocated with *in litteris* support from Myers that *A. ramirezi* should be assigned to the genus *Geophagus* Heckel.

After a long period of tranquility, Kullander (1977) described a new genus, *Papiliochromis*, with *A. ramirezi* as type species. Kullander (1977) mentioned *Microgeophagus* as an unavailable name, but did not detail on it, and referred to Klee (1971), Wickler (1956a, 1960), and Scheel (1972) for studies with data supporting the establishment of a new genus. Kullander (1980) redescribed *A. ramirezi* in *Papiliochromis* and provided a species bibliogra-

phy, but did not discuss the status of *Microgeophagus*. The name *Papiliochromis* caught on rapidly in the ornamental fish industry and with some delay also in scientific literature. Bailey & Robins (1982) then reviewed some of the basic literature, concluding that *Microgeophagus* from its use by Axelrod (1971) is the oldest available generic name for a genus with *A. ramirezi* as type species. This sparked some discussion in magazines dedicated to pet fish. Géry (1983), in opposition to Bailey & Robins (1982), concluded that *Microgeophagus* used by Frey (1957) is the oldest available name for the genus in question. Allgayer (1985) rejected all names prior to *Papiliochromis* Kullander (1977). Géry (1986) countered Allgayer (1985), reiterating his 1983 standpoint with more detailed arguments.

Kullander (1998, 2003) used the name *Mikrogeophagus* Meulengracht-Madsen (in Schiøtz & Christensen 1968) from a description in an aquarium book. Meanwhile I had found that the ornamental fish literature is littered with mention of generic names for *A. ramirezi*, and *Mikrogeophagus* was the earliest that might claim availability. Also *Papiliochromis* had found its way into ornamental fish books before its formal description (Meulengracht-Madsen in Schiøtz & Christensen 1975). Unlike in Frey (1957), those names were accompanied by diagnostic characters, so they have to be treated as available. Unlike various mention of “*Microgeophagus*” in the aquarium literature they are new generic names and not re-use of an unavailable name. Unfortunately, a supporting document was not published, and it was never really clarified why *Microgeophagus* of Frey is unavailable or why *Mikrogeophagus* is the oldest available name.

The history behind the putative problem with the generic name and its potential solution has been addressed by several other authors, of which one paper (Bailey & Robins 1982) appeared in a widely available scientific journal. All other publications discussing the status of the generic name of *A. ramirezi* are in grey or ornamental fish literature. This may be significant for the problem, which highlights how difficult it is to find names hidden in ornamental fish literature, and how persistently some authors and publishers maintain an aquaristic nomenclatural subculture. Note also that already the species was plagued by having its name published inadvertently in a hobby magazine ahead of the formal description. Most recently, Isbrücker (2011) proposed again that *Microgeophagus* as used by Frey (1957) is an available name. The article mainly reiterates statements from Géry (1983, 1986).

In order to get out of the loop of an endless discussion inside the ornamental fish publishing industry, it seems desirable to publish the case in an Open Access article in a peer-reviewed journal, so that all information is universally available and that the conclusions have been checked by others. This paper is thus a clarification of the status of all generic names that are known to me that have been proposed for *Apistogramma ramirezi*. It shows that Isbrücker’s (2011) conclusions are not correct and examines the role of ornamental fish literature in managing information that is mainly scientific, including nomenclatural acts.

Material and methods

This is essentially a literature study, and a comparison of publications with the International Code of Zoological Nomenclature, 4th Edition (International Commission on Zoological Nomenclature 1999), henceforth referred to as the Code. Also, the earlier Règles from 1905 (Blanchard 1906) and one of its amendments (Stiles, 1928), as well as earlier editions of the Code were examined (International Commission on Zoological Nomenclature, 1961, 1964, 1972, 1985). Isbrücker (2011) preferred to use the German translation of the 1999 Code. It was not available to me. Instead, in addition to the English and French version (1999), I have consulted the Chinese version (International Commission on Zoological Nomenclature 2002).

A large number of aquarium books and magazines were screened for generic names associated with *Apistogramma ramirezi*, including all those mentioned by other authors as containing relevant information. Each instance was evaluated for availability based on earlier assessments and comparison with the Code. The results section starts with a formal synonymy which may be used for reference, and then follows information about each name arranged chronologically in approximately the order names have been published; the evaluation is done directly for each name. The use of the names *Microgeophagus*, *Pseudogeophagus*, *Pseudoapistogramma* here is disclaimed for nomenclatural purposes in accordance with the Code, Article 8.3, and they are consequently not italicized except when appearing in verbatim quoted text. *Mikrogeophagus* Meulengracht-Madsen, 1968, *Papiliochromis* Meulengracht-Madsen, 1975, and *Papiliochromis* Kullander, 1977, are available names, and are not disclaimed. All of the popular literature consulted is unfortunately copyrighted and cannot be reproduced. Relevant passages have been

quoted *in extenso*. Translations from Danish, Dutch, German, and Swedish were done by me and appear within square brackets.

Results

Formal synonymy of *Mikrogeophagus Meulengracht-Madsen*

Mikrogeophagus Meulengracht-Madsen in Schiøtz & Christensen, 1968, p. 370 (type species by monotypy *Apistogramma ramirezi* Myers & Harry in Anonymous, 1948).

Papiliochromis Meulengracht-Madsen in Schiøtz & Christensen, 1975, p. 329 (type species by monotypy *Apistogramma ramirezi* Myers & Harry in Anonymous, 1948).

Papiliochromis Kullander, 1977, p. 253 (type species by original designation *Apistogramma ramirezi* Myers & Harry in Anonymous, 1948).

Microgeophagus Frey, 1957, p. 52 (unavailable; nomen nudum; no type species, not treated as valid, no diagnosis of genus; no species included).

Pseudogeophagus Hoedeman, 1967, p. 120 (unavailable; nomen nudum; not treated as valid; naked chresonym, reference to non-existing publication).

Pseudoapistogramma Axelrod, 1971, p. 244 (unavailable; nomen nudum; not treated as valid; no diagnosis;).

All other instances of the names in this synonymy may be considered as chresonyms, i.e., simple usage (Smith & Smith 1972).

Microgeophagus attributed to Frey (1957 and 1959). Frey (1957, 1959) is a self-indexed aquarium hobby encyclopaedia, *Das Aquarium von A bis Z*. There are six places of relevance to *Microgeophagus* in the book, as listed below. The relevant text is exactly the same in the first edition (1957) and the third edition (1959), but appears on different pages. Page numbers in the third edition are given in parentheses below. Names are not italicized in the original, and use of accents is inconsistent.

On page 52 (55), under the entry *Apistogramma* it is speculated that “Vermutlich wird es einmal zu einer Aufgliederung der Gattung kommen müssen...” [Probably at a later stage a subdivision of the genus will have to be made], but no specific changes are proposed.

Page 56 (57) includes a long description, under the heading [*Apistogramma*] *ramirézi*. It includes morphology and behaviour notes and ends with the remark:

“Die Abweichung im Verhalten von den übrigen A.-Arten ist auffallend. Es scheint, daß die Art zu Unrecht der Gattung *Apistogramma* zugeordnet wurde, weshalb neuerdings ihre Einbeziehung in eine neue Gattung, *Microgeophagus*, vorgeschlagen wird. Mindestens könnte sie eine Übergangsform darstellen.” [The difference in behaviour from the other A. species is striking. It seems that the species was incorrectly assigned to the genus *Apistogramma*, for which reason recently its inclusion in a new genus, *Microgeophagus*, was proposed. At least it could represent a transitional form.]

Page 375 (391), entry in full: *Microgeophagus*. Evtl. [Eventuell] neu aufzustellende Gattung aus der Familie der Buntbarsche oder Cichlidae (←), der möglicherweise *Apistogramma ramirezi* zuzurechnen ist. [A genus of the cichlid family or Cichlidae, possibly to be erected as new, in which *Apistogramma ramirezi* perhaps is to be included.]

Page 416 (432), figure 9 caption: “*Apistogramma ramirezi* Schmetterlingsbuntbarsch.”

Page 449 (464), entry in full: “*ramirézi* = nach dem Fänger M.V. Ramirez -, *Apistográmma*”.

Page 475 (490), entry in full: “Schmetterlings-Buntbarsch (á) *Apistogramma ramirezi*”.

Even though Géry (1983) considers the statement on p. 56 as a definite proposal of a new generic name, it is obvious from the other references to *A. ramirezi* that Frey considers splitting of *Apistogramma* and establishment of *Microgeophagus* as actions that may happen in the future (pp. 52, 375), and he consistently uses *Apistogramma* as the valid generic name for *A. ramirezi* (pp. 52, 56, 416, 449, 475). Thus, *Microgeophagus*, as used by Frey, is unavailable with reference to the Code Article 11.5: “To be available, a name must be used as valid for a taxon

when proposed, unless it was first published as a junior synonym and subsequently made available under the provisions of Article 11.6.1". In consistently using the combination *Apistogramma ramirezi*, Frey fails to show any usage of *Microgeophagus* as a valid name. Also in later books by Frey (1973, 1975), he uses *Apistogramma ramirezi*.

In its context, *Microgeophagus* is not proposed as a synonym of *Apistogramma*, but such an interpretation might be argued. If it were so, Article 11.6.1 states that if "a junior synonym had been treated before 1961 as an available name and either adopted as the name of a taxon or treated as a senior homonym, it is made available thereby ..." There is no usage of *Microgeophagus* in the period 1957-1960, except in editions of *Das Aquarium von A bis Z*, and in those, *Microgeophagus* is not treated as a valid name.

Klee (1971) was perhaps the first aquarist to discuss differences between *Apistogramma ramirezi* and other species of that genus. Klee referred *A. ramirezi* to *Geophagus*, pointing to morphological differences and referring most explicitly to a study of egg structures by Wickler (1956a,b) which found differences between *A. ramirezi* and three other *Apistogramma* species. Klee's concluding remarks are:

"Among hobbyists, the name '*Microgeophagus ramirezi*' has circulated more or less *sub rosa* for a number of years. The source of the term '*Microgeophagus*' is a German aquarium book published in 1959 [Frey 1959]. My translation of the reference is as follows:"

"*Microgeophagus*—An eventually establishable genus belonging to the family of cichlids or Cichlidae in which possibly *Apistogramma ramirezi* could be placed."

"Under no circumstances does this qualify as a valid description of a new genus under the International Rules of Zoological Nomenclature. Aquarists are misled if they use it."

Whereas the translation is essentially correct, one may note that the English word eventually and the German word eventuell do not have the same meaning. In English it refers to something that will happen, whereas in German it means maybe, and refers to something that might happen.

Meinken (1971) discussed previous articles about *Apistogramma ramirezi* and *Microgeophagus* as used by Frey. Meinken definitely labelled the latter a name as a *nomen nudum*. He concluded that papers on egg morphology by Wickler (1956a, b), together with morphological differences might support establishing a new genus for *A. ramirezi*, or possibly its referral to *Geophagus*.

Robins & Bailey (1982) accepted *Microgeophagus* as unavailable, but did not provide further analysis.

Géry (1983) (repeated by Isbrücker 2011), presumably using the 1964 edition of the Code, argues that *Microgeophagus* cannot be rejected because it is proposed conditionally as evident by the use of the word "eventuell" [maybe]. Article 15 (11.5.1 in the current Code) stipulates that a name proposed conditionally after 1960 is unavailable (hence conditional names were not impossible before 1961). However, *Microgeophagus* was not proposed with conditions. A conditional proposal would take the form: "If this taxon is valid it will have the name *Aus*". Frey does not make any such conditional statement, although he is vague on whether *Apistogramma ramirezi* might belong to *Microgeophagus*. Frey's statement concerns the possibility of the taxon, not the name. Because *Microgeophagus* does not contain any species, it cannot be available (Article 13(b) in the 1964 Code).

Isbrücker (1984) presented an annotated corrigenda to names published in past volumes of the Dutch ornamental fish magazine *Het Aquarium*. Therein he writes under the heading "*Papiliochromis* must be *Microgeophagus*" (translated from the Dutch):

"In 1957 *Apistogramma ramirezi* was placed by Frey in an unusual manner in a new genus. He writes that the species seems to be incorrectly allocated in the genus *Apistogramma* and that he suggests a new genus *Microgeophagus*. Later in the same (alphabetical) book under *Microgeophagus* he mentions this name as a new genus to be erected to which presumably *Apistogramma ramirezi* must be counted. According to the rules of nomenclature (Art. 11, 13 and 15) this method of erection of a genus is indeed valid, namely until 31 December 1960. The key issue is whether or not *Microgeophagus* Frey, 1957 must be considered as a *nomen nudum*, i.e., an invalid name. *Microgeophagus* was erected in the form of a subgenus (within *Apistogramma*) with a clearly named type species. Article 15 of the Code states that after 1960 this prac-

tice is not valid. It follows that the name *Microgeophagus* is safe. Many authors disagree on this, in my opinion on subjective grounds.”

Obviously it is not true that *Microgeophagus* was treated as a subgenus of *Apistogramma* Regan. Article 15 says nothing about subgenera. Isbrücker (1984) lists Articles 11, 13, and 15 as positively decisive for the validity [=availability] of *Microgeophagus*. Whereas Article 11 is complied with, it is doubtful if any distinguishing characters are reported, as required by Article 13, and article 15 concerns only conditionally proposed names, varieties and forms.

Allgayer (1985), in a critical comment on Géry (1983), considered *Microgeophagus* Frey as unavailable referring to Articles 27 and 67c (presumably in the 1985 edition of the Code). Article 27 forbids the use of diacritic marks, apostrophes, or diaereses in scientific names, as used in the original spelling *Microgeóphagus*. However, Article 32(d)(i)(2) specifies that such names are available and need only to be corrected by simple deletion of the diacritic mark, as already pointed out by Géry (1986) in a response to Allgayer (1985).

Article 67c specifies a strict designation of a type species. Allgayer points out that Frey (1957) notes that *A. ramirezi* “möglichlicherweise” [possibly] might belong to *Microgeophagus*. I agree that this constitutes a violation of Article 67(c)(3) in the 1985 Code (Article 67.5.3 in the 1999 Code) in being a designation “made in an ambiguous or conditional manner”, except that the name is not used as valid so with Article 11(d) the name is not available (see above), and it cannot have a type species, ambiguous or not. Already the Règles (Blanchard 1906), in effect in 1957, stipulated that there must be a “definite unambiguous designation of the type species” (Stiles 1928). Géry (1986) thinks the designation of the type species is unambiguous. If an author considers a species as “possibly” belonging to a genus it is, however, not a matter of opinion whether that species is ambiguously designated as type species or not. In any case, because only originally included species can become type species of a genus, *A. ramirezi* is not eligible as type species with reference to the Code Article 67.2.5 “A nominal species is deemed not to be originally included if it was doubtfully or conditionally included, or was cited as a species inquirenda, or as a species incertae sedis.” Frey’s “möglichlicherweise” is a clear statement of doubt about the inclusion of *A. ramirezi* in the possible future genus *Microgeophagus*.

Isbrücker’s (2011) arguments for considering *Microgeophagus* as used by Frey as available are very similar to those of Géry (1983, 1986). One aspect he brings up, however, is the interpretation of the text in Frey (1957). Referring to the text on p. 56 Isbrücker writes:

“Schon Géry nahm an, dass Freys ‘neuerdings’ ‘presently’ bedeutet (1986:89, persönliche Auskunft von V. Mahnert). Die Verwendung von ‘neuerdings’ deutet auf ein Ereignis oder eine Situation die bereits stattgefunden haben. Daher steht ‘neuerdings’ im Widerspruch zu etwas, was wirklich neu ist. Hier schlägt Frey jedoch offensichtlich einen neuen Gattungsnamen vor (das heißt, es gibt keinen Autor, der vor ihm einen solchen Namen gültig eingeführt hätte”. [Already Géry assumed that Frey’s “neuerdings” means “presently” (1986:89, personal communication from V. Mahnert). The use of “neuerdings” points to an event or a situation that [has] already taken place. With that “neuerdings” stands in contradiction to something that really is new. Here, however, Frey obviously proposes a new genus name (i.e., there is no author that had validly introduced such a name before him).]

“Gültig” [valid] here is obviously used in error for “verfügbar” [available]. How the contradictive status of “neuerdings” supports availability of *Microgeophagus* is not explained. Géry (1983) wrote in French, and consequently used “présentement”, not “presently”. Géry explains that “neuerdings” means “récentement” [recently]. However, when in the same sentence “vorgeschlagen wird” is being translated as “est proposée” (present indicative), “neuerdings” takes the meaning of “présentement” [presently, at the moment of writing/speaking, from today, in this case, with present knowledge]. The translation and comments are credited Volker Mahnert. Nevertheless, application of French grammatical rules cannot be decisive for how the German text should be understood.

Isbrücker (2011) also claims that the taxon cannot be rejected because it is hypothetical. He correctly points out that the Code (Article 1.3.1) in excluding hypothetical concepts refers to an entirely abstract construction. However, Frey’s name is not hypothetical in that sense, so there is no need to invoke that Code article. Frey’s speculation about acts of removing *A. ramirezi* from *Apistogramma*, of giving it its own genus, and giving to that genus the name *Microgeophagus*, however, is purely hypothetical.

Isbrücker (2011) then refers to Article 11.5 but only 11.5.1 which concerns conditional names, and concludes that a conditional proposal does not prevent availability (see above for assessment); Article 27, and 43.5.2.4.3 about diacritic marks, also not preventing availability (see above for assessment); and Article 86.3 which states that the present Code overrules all earlier Codes. The rest of the article does not offer further relevant information for the assessment of the availability of *Microgeophagus* as used by Frey.

Géry's (1983, 1986) and Isbrücker's (2011) arguments, and those by other authors claiming *Microgeophagus* to be valid are nullified by the fact that Frey did not use *Microgeophagus* as a valid name. Even if a name satisfies all but one of the conditions for availability, just one Code article is sufficient to render it unavailable, and there is no need to consider other articles.

Klee (1971) and Kullander (1977) cited the third edition (Frey, 1959) of *Das Aquarium von A bis Z*. Robins & Bailey (1982) cite both the first (Frey 1957) and the third edition. There are actually 14 editions between 1957 and 1976. I have examined three copies of the first edition, and one copy of the third edition. Isbrücker (2011) only consulted the fourth edition, which he dates to 1961, but he still lists only the first edition among the references. Géry (1983) has a reference to the first edition, but his page numbers correspond to those in the third edition. Later, Géry (1986) explains that he has not seen the first edition, but that the page numbers refer to the second edition, 1959.

At the time of publication of Frey (1957) the Règles internationales de la Nomenclature zoologique (Blanchard 1906) served the function now taken by the International Code of Zoological Nomenclature. It was replaced by the first Code in 1961, with the almost identical second edition in 1964. It in turn was extended in 1972 by a collection of amendments decided on since 1963. A totally revamped Code was published with the third edition in 1985. The present fourth edition (1999) is in effect since 2000. Each Code supersedes all earlier Codes, i.e., any name must be judged by the present Code only. In its present form Article 11.5, which provides the strongest evidence of the unavailability of *Microgeophagus* in Frey (1957), came, as Article 11(d), with the third edition (1985), requiring a name to be used as valid when proposed. In the previous (1961, 1964) Code editions Article 11(d) about publication in synonymy has approximately the same meaning. As it was originally worded it could possibly have been interpreted as referring to a formal synonymy. Although it seems illogical to publish names as (junior) synonyms, it happens, e.g., when an author reports on manuscript names of others. In the third edition of the Code (1985) it is made clear that Article 11(d) refers to junior synonyms. *Microgeophagus* as used by Frey (1957, 1959) could easily have been rejected under the first edition of the Code (1961) if considered a synonym of *Apistogramma*. It is definitely unavailable by application of the 1985 and 1999 Codes because *Microgeophagus* was not used as the valid name. Although somehow overruled by the ineligibility of *A. ramirezi* as type species (Article 67.2.5), the third objection to availability of *Microgeophagus* is presented by the requirement for a definite and unambiguous designation of the type species (Article 67.5.3). This requirement is present from the amendment to the Règles in 1927 (Stiles 1928), and maintained in all editions of the Code.

Article 11(d) in the first edition (1961): "Publication in synonymy, — A name first published as a synonym is not thereby made available"

Article 11(d) in the second edition (1964): "Publication in synonymy, — A name first published as a synonym is not thereby made available unless prior to 1961 it has been treated as an available name with its original date and authorship, and either adopted as the name of a taxon or used as a senior homonym."

Article 11(e) in third edition (1985): "Publication as a junior synonym, — A name first published as a junior synonym is not thereby made available unless prior to 1961 it has been treated as an available name and either adopted as the name of a taxon or treated as a senior homonym; such a name dates from its first publication as a synonym ..."

- (i) "A name that is unavailable under any other provision of this Chapter [=Chapter IV. Criteria of availability] cannot be made available by adoption from a citation as a junior synonym.
- (ii) A name first published as a junior synonym after 1960 cannot be made available from that nomenclatural act."

Article 11.6 in the fourth edition (1999): “Publication as a synonym, A name which when first published in an available work was treated as a junior synonym of a name then used as valid is not thereby made available.

11.6.1 However, if such a name published as a junior synonym had been treated before 1961 as an available name and either adopted as the name of a taxon or treated as a senior homonym, it is made available thereby but dates from its first publication as a synonym....”

“11.6.2. A name published before 1758 but after 1758 cited as a synonym of a name used as valid cannot be made available under Article 11.6

11.6.3. A name first published after 1960 and treated as a junior synonym on that occasion cannot be made available from that act under Article 11.6.”

Article 11d in Third edition (1985): “Names to be treated as valid when proposed. — Except as in (i) below, a name must be treated as valid for a taxon when proposed unless it was first published as a junior synonym and subsequently made available under the provisions of Section e of this article.

(i) A name proposed conditionally for a taxon before 1961 is not to be excluded on that account alone [Art. 15].

(ii) The status of a previously unavailable name is not changed by its mere citation accompanied by a reference to the work in which the name was published but was not made available.”

Article 11.5 in the fourth edition (1999): “Names to be used as valid when proposed. To be available, a name must be used as valid for a taxon when proposed, unless it was first published as a junior synonym and subsequently made available under the provisions of Article 11.6.1

11.5.1 A name proposed conditionally for a taxon before 1961 is not to be excluded on that account alone [Art. 15].

11.5.2. The status of a previously unavailable name is not changed by its mere citation (that is, without adoption for a taxon) even if accompanied by a reference to the work in which the name was published but was not made available.”

The original Règles were quite uncomplicated and more focussed on names than on types or criteria of availability and publication. In 1927 the International Zoological Congress adopted an amendment to Article 25 (Law of priority) of the Règles (Stiles 1928). It clearly shows which were the conditions for new species in 1957. This amendment took force from January 1931, and remained till 1961. In the first (1961) through fourth editions (1999) of the Code it is under Article 23, and in the fourth edition (1999) it is called Principle of Priority. The subarticles from the Règles have been distributed in other articles. Article 25 in the Règles in its entirety is as follows (from Stiles 1928).

“Article 25. — The valid name of a genus or species can be only that name under which it was first designated on the condition:

(a) That (prior to January 1, 1931) this name was published and accompanied by an indication, or a definition, or a description; and

(b) That the author has applied the principles of binary nomenclature.

(c) But no generic name nor specific name, published after December 31, 1930, shall have any status of availability (hence also of validity) under the Rules, unless and until it is published either

(d) with a summary of characters (seu diagnosis; seu definition; seu condensed description) which differentiate or distinguish the genus or species from other genera or species;

(e) or with a definite bibliographic reference to such summary of characters (seu diagnosis; seu definition; seu condensed description). And further

(f) in the case of a generic name, with the definite unambiguous designation of the type species (seu genotype; seu autogenotype; seu orthotype).”

***Mikrogeophagus* Meulengracht-Madsen, 1968.** The name *Mikrogeophagus* is used in five places in a multi-authored aquarium book in the Danish language, *Jeg har akvarium*, edited by Arne Schiøtz and Steffen Christensen (1968). Authors of various parts are clearly stated. The author of chapters referring to *Mikrogeophagus* is Jens Meulengracht-Madsen. The five relevant entries are:

(1) Page 266: The encyclopaedic reference to *Apistogramma ramirezi* has only a reference to *Mikrogeophagus*: “A. *ramirezi*, se *Mikrogeophagus*, side 268”. [A. *ramirezi*, see *Microgeophagus*, page 268.]

(2) Page 268 has a long description headed *Mikrogeophagus ramirezi*. The description is not comparative, and no comment is made on the generic name used.

(3) Page 370: The following paragraph is contained in a chapter on breeding of aquarium fishes: ”Sommerfuglecichliden *Mikrogeophagus ramirezi* blev tidligere henregnet till slægten *Apistogramma*, men er på grund af at ynglebologien svarer til de øvrige fritlegende cichlidens blevet opstillet i sin egen slægt indtil videre.” [The Butterfly cichlid *Mikrogeophagus ramirezi* was previously referred to the genus *Apistogramma*, but because the spawning biology corresponds with the other open spawning cichlids it has been established in its own genus for the time being.] The chapter has sections devoted to describing the characteristics of the two categories open spawning (including *Mikrogeophagus*) and egg-hiding (including *Apistogramma*) cichlids. Distinguishing attributes include monogamy and isomorphic sexes in open spawners and polygamy (polygyny) and sex dimorphism in egg hiders.

(4) Page 372: Just a mention that *Mikrogeophagus ramirezi* is difficult to propagate.

(5) Page 429: Index listing with reference to *Mikrogeophagus ramirezi* on pp. 268, 370 and 372. There is no *Apistogramma ramirezi* entry in the index.

Whereas the passive “has been” suggests that the establishment of the name *Mikrogeophagus* is not original here, it is obvious that *Mikrogeophagus* is used as a valid name (cf. entry reference p. 266). The text on p. 370 gives differential characters (required by Code Article 13.1.1) for *Mikrogeophagus ramirezi*. It is clear from the text on pp. 266 and 268 that *Apistogramma ramirezi* Myers & Harry is the species referred to in the *Mikrogeophagus ramirezi* combination, although authors are not given. The name *Mikrogeophagus* is thus available by reference to the characters of the single mentioned species. The type species by monotypy is *Apistogramma ramirezi* (cf. Code Articles 13.3 and 68.3).

The name *Mikrogeophagus*, although obviously unintentionally proposed, satisfies relevant criteria of the Code and should be formally cited as *Mikrogeophagus* Meulengracht-Madsen in Schiøtz & Christensen, 1968, p. 370 (type species by monotypy *Apistogramma ramirezi* Myers & Harry in Anonymous, 1948). This is the earliest instance I can find of the use of an available generic name for *Apistogramma ramirezi*.

The Swedish translation of Schiøtz & Christensen (1968), *Akvarium som hobby* (Schiøtz & Christensen 1970) consistently uses *Mikrogeophagus*. The second edition of *Jeg har akvarium* (Schiøtz & Christensen 1970a) has the same text about *Mikrogeophagus ramirezi* as the first edition, but a photograph captioned “*Mikrogeophagus ramirezi*, sommerfuglecichlide, hun. (Foto: MM).” is added on p. 280. In the third and last edition of *Jeg har akvarium* (Schiøtz *et al.* 1975), the systematic section has been removed. In the foreword the editors refer instead to another ornamental fish book, *Akvariefisk i farver*, by Meulengracht-Madsen (1975). *Mikrogeophagus ramirezi* is mentioned in a section authored by Meulengracht-Madsen on pages 332, 335 and 336, and listed in the index, p. 398. The text on p. 332 is identical to that on p. 370, in the first edition, that on p. 335 to p. 372 in the first edition.

Pseudogeophagus attributed to Hoedeman (1969, 1974). In a Dutch aquarium book, later translated to English, Hoedeman (1969:120, 1974:1041) described at length the aquarium behaviour of *A. ramirezi*, under the heading and otherwise consistent use of *Apistogramma ramirezi*. In the second paragraph he writes, quoted from the English edition (Hoedeman 1974): “The higher and somewhat more thick-set body of *A. ramirezi* deviates from the *Apistogramma* type. In addition the outgrown spines of the dorsal fin, particularly in the male, are very conspicuous and become longer and longer as the fish continues to grow. This was reason enough for Wickler (1963) to establish the genus *Pseudogeophagus* for this species.” No paper by Wickler in 1963 is listed among the references in the Dutch edition, and Wickler is equally absent from the longer reference list in the English edition. In Hoedeman (1969, 1974) *Pseudogeophagus* is a nomen nudum because it refers to a non-existing reference. It is also not used as the valid generic name for the only species cited (Code Article 11.5).

Possible name attributed to Wolfgang Wickler. Wolfgang Wickler, an ethologist working with cichlid behaviour is sometimes cited as the source of a name or at least the reasons for separating *A. ramirezi* from *Apisto-*

gramma (Hoedeman, 1969, 1974; Axelrod, 1971). I asked him if he has published anything about *Microgeophagus* or *Pseudogeophagus*, and I have the following response (*in litt.*, 28 March 1978):

“I have never published any suggestions regarding either *Microgeophagus* or *Pseudogeophagus*. All I did was to strengthen Hoedeman’s intention to separate *ramirezi* from *Apistogramma* and put it close to *Geophagus*.”

A similar statement from Wickler was reported by Robins & Bailey (1982). Wickler published at least two papers relevant for the issue. Wickler (1960), in a hobby journal, is mainly a comparison of *A. ramirezi* with *Geophagus* and other *Apistogramma*, elicited by a personal communication from Herrmann Meinken suggesting to refer the species to *Geophagus*. Based on aspects of morphology, egg morphology (Wickler 1956a), and behaviour, Wickler’s (1960) conclusion is that *A. ramirezi* is not an *Apistogramma*, and he recommends to refer to *A. ramirezi* with the generic name in quotes as done in the title of his article.

In Wickler (1956a) there is only a description of the egg of *Apistogramma ramirezi*. In another paper on egg morphology (Wickler 1956b) there is no mention of *A. ramirezi*. There is no known publication by Wickler using the name *Microgeophagus* (or *Pseudogeophagus* or *Pseudoapistogramma*), and in none of the articles referring to Wickler as source of generic names for *A. ramirezi* is there any bibliographical reference to such a paper.

Pseudoapistogramma and Microgeophagus attributed to Axelrod (1971). In a book about breeding ornamental fishes, Axelrod (1971) describes and illustrates the breeding behaviour of what he calls *Microgeophagus* (*Apistogramma*) *ramirezi* in a separate chapter, pp. 344–352. The same name is used in the Table of Contents on p. 4. There is no index to the book. It is not explained why the name is written in this way, but probably *Apistogramma* is written in parenthesis to signal that it is an earlier name, not that it would represent a subgenus. Axelrod rejects the name *Microgeophagus* as inappropriate, suggesting that *Pseudoapistogramma* would have been a better choice. That speculation does not confer any nomenclatural status at all to *Pseudoapistogramma*. He emphasizes, however, that “whether you like it or not, the name *Microgeophagus* it is”. On p. 344 Axelrod gives Wickler as authority for *Microgeophagus*: “... [A] great German fish behaviorist by the name of Wickler studied the ram and said [that] it has such a very different method of breeding, egg hatching time and spawning site, it doesn’t belong in the genus *Apistogramma* but in an entirely new genus which he proposed to be called *Microgeophagus*.” It is likely that Axelrod did not have first hand information about the name and author, but was referring to information provided by Richter on p. 345.

Almost the whole chapter about *Microgeophagus* (*Apistogramma*) *ramirezi* is a continuous quote from “notes” by Hans Joachim Richter, an East German aquarist and photographer. It seems likely that Richter’s text and photos were adopted from an earlier publication, but I have not located it. Richter’s text starts with “Due to the breeding behavior of this species, which diverges from that of the other *Apistogrammas* (substratum; hatching time; spawning period), Wickler has established the new genus *Microgeophagus*, of which *Microgeophagus ramirezi* is the only representative.” The description ends with the paragraph: “As my explanations show plainly, the spawning behavior of this fish diverges strongly from that of the other fishes of the genus *Apistogramma*. This is the reason why Wickler has established the new genus *Microgeophagus*. This is quite understandable, and we should try to get used to calling our beautiful ram *Microgeophagus ramirezi*.”

Neither Axelrod nor Richter state anywhere how *A. ramirezi* would differ from other species of *Apistogramma*. There are only those references to “method of breeding, egg hatching time, spawning site, substratum, hatching time, spawning period”, but unlike in Meulengracht-Madsen no differentiating character states are provided. Also, neither Axelrod nor Richter provides a bibliographic reference to any publication by Wickler.

Robins & Bailey (1982) consider *Microgeophagus* Axelrod as an available name. They obviously did not regard Richter’s part of the text as significant. Burgess (1982) summarized Robins & Bailey (1982), repeating their bibliography. That review does not confer availability on any of the names listed.

Microgeophagus as used in Axelrod (1971) fails availability under Article 13 (Code of 1999) because there is no reference to the supposed description (cf. Article 13.1.2), and also because there is no information specifying how *Microgeophagus* would differ from *Apistogramma* (cf. Article 13.1.2). The sweeping lists of reproductive aspects contain no more information than would a statement like “*Microgeophagus* differs in appearance from *Apistogramma*”.

Microgeophagus used by Scheel (1972). Jørgen J. Scheel, a Danish aquarist, studied chromosomes chiefly in killifish (Rivulidae). In an article in the *Advanced Aquarists Magazine*, a club journal from Atlanta, with a fairly large edition of 600 copies, Scheel (1972) reported on studies in cichlids. On p. 4 he writes:

"The basic or almost basic karyotype is maintained in the genera *Cichlasoma* [... lists several genera with species studied ...] with about 2x7 telos, *Microgeophagus* (*M. ramirezi*) with 2x16 telos, and *Pelmatochromis thomasi* with 2x19 telos." The next sentence describes reduced numbers in *Apistogramma ortmanni* and *A. agassizi* and species of three other genera. Later on he writes: "... *Microgeophagus ramirezi* by karyotypic details separates distinctly from *Apistogramma* (5 species studied) by the somewhat higher diploid number and more markedly by the many telos. These are few in most *Apistogramma* (2x1 to 2x2) with a maximum in *A. ortmanni*."

Use of *Microgeophagus* here apparently goes back to the earlier *nomen nudum*. One may argue here also that this mention does not confer availability of *Microgeophagus* because the genus is not diagnosed. Also in Meulengracht-Madsen (1968) it is the species that is diagnosed, but therein is clearly stated that it is in its own genus (i.e., monotypic) and the name *Mikrogeophagus* is applied on it because of certain character states in reproductive behaviour.

Microgeophagus not yet attributed to Meulengracht-Madsen (1974). Meulengracht-Madsen (1974) was published in several languages in Europe and the United States. This is the first edition authored by Meulengracht-Madsen; the earlier edition was written by Georg Mandahl-Barth and appeared in several printings from 1955 till 1972. On page 189 there is a description under the heading *Microgeophagus ramirezi*, with "(*Apistogramma ramirezi*)" in parenthesis below. The text gives basic information about size, distribution, aquarium care, and reproduction. The following is nomenclaturally relevant:

"Der hersker en vis uenighed om, hvor Sommerfugle-cichliden systematisk hører hjemme. I yngle-adfærd adskiller den sig fra slægten *Apistogrammas* arter ved at være ikke-seksualdimorf, monogam og fritlegende." [Certain disagreement reigns about where the butterfly cichlid belongs systematically. In breeding behaviour it differs from the species of *Apistogramma* by being non-sexually dimorphic, monogamous, and free spawning.]

The species is illustrated as figure 268 on a colour plate, and listed in the index both as *Apistogramma ramirezi* and *Microgeophagus ramirezi*. Whereas this description may make available the name *Microgeophagus*, it may also be considered as a spelling error of *Mikrogeophagus*.

The Swedish translation (Meulengracht-Madsen (1976) has almost the same text: "I fråga om yngelvården skiljer den sig från *Apistogramma*-arterna eftersom den inte är sexualdimorf, monogam och fritt lekande." [Regarding the brood care it differs from the species of *Apistogramma* because it is not sexually dimorphic, monogamous and open spawning]. Although this may seem like a negative diagnosis, there is evidently a translation error involved. It should be understood as "eftersom den är monogam och fritt lekande, samt saknar könsskiljande karaktärer" [because it is monogamous, open spawning, and also lacks sex distinguishing characters].

***Papiliochromis* Meulengracht-Madsen (1975).** The name *Papiliochromis* first appears in sections authored by Meulengracht-Madsen in the second Swedish edition of *Jeg har akvarium* (Schjötz & Christensen 1975). *Papiliochromis* simply replaces *Mikrogeophagus* in the earlier Swedish edition (Schjötz & Christensen 1970b). Apparently, the second Swedish edition is based on the second Danish edition from 1970 (Schjötz & Christensen 1970a), but the name *Papiliochromis* does not appear in any of the Danish editions. *Papiliochromis* may have been inserted by one of the translators as well as by an original author. At the time I may have carelessly informed others of the name I intended for the genus.

Page 233 is a reference from *Apistogramma ramirezi* to *Papiliochromis ramirezi* on p. 235

Page 235 holds a general description.

Page 329 has about the same text as on p. 370 in the Danish 1968 edition.

Page 331 has about the same text as on p. 372 in the Danish 1968 edition.

Page 385 corresponds in contents to p. 429 in the Danish 1968 edition.

Papiliochromis is made available here with the same qualifications as *Mikrogeophagus* in Schjötz & Chris-

tensen (1968), alternatively may be considered as an unnecessary replacement name, which would also be available. The oldest original reference to *Papiliochromis* that I can find is thus: *Papiliochromis* Meulengracht-Madsen in Schiøtz & Christensen, 1975. *Akvarium som hobby*, p. 329 (type species by monotypy *Apistogramma ramirezi* Myers & Harry in Anonymous, 1948). It is a junior objective synonym of *Mikrogeophagus* Meulengracht-Madsen, 1968.

***Papiliochromis* Kullander (1977).** Kullander (1977) described *Papiliochromis* as a new genus with *A. ramirezi* as type species. This description fulfils all requirements for availability, but *Papiliochromis* Kullander is a junior synonym of *Mikrogeophagus* Meulengracht-Madsen, 1968 and homonym of *Papiliochromis* Meulengracht-Madsen, 1975.

Licrogeophagus, Mikrogeophagus and Pseudogeophagus attributable to Géry (1983, 1986). Géry (1983, 1986) presented *Mikrogeophagus* used by Frey (1957) and *Pseudogeophagus* used by Hoedeman (1969) as available names. Because he does not use *Pseudogeophagus* as a valid name, he does not confer availability to it himself. In the case of *Mikrogeophagus*, however, he treats it as a valid name, with a type species, and provides references to earlier literature. In the species bibliography in Géry (1983) it is misspelt *Licrogeophagus*, but this is an obvious lapse or typesetter error. It is clear from the discussion, however, that Géry (1983, 1986) is discussing a nomenclatural issue of availability of names, using *Mikrogeophagus* as a chresonym based on an unavailable name, and it seems advisable not to read this article as containing nomenclatural acts.

Other uses of generic names for *Apistogramma ramirezi*. The ornamental fish literature is generally poorly indexed. Many magazines have an annual index, but there are many magazines. On top of that there are a vast number of books and translations in different editions and printings. Although every library may have a few aquarium books, it would be a monumental task to search through all for possibly inadvertently described fishes. Consequently, I have not searched every edition of every hobby publication for instances of generic names for *A. ramirezi*. The scientific literature is well indexed through *Zoological Record* which also covers some popular literature.

In the systematic section of *Zoological Record* from 1957 till 1978 there is no reference to *Mikrogeophagus* or to *Mikrogeophagus*. The only combination used between 1957 and 1977 is *Apistogramma ramirezi* with the following number of references: 1957–1968 (0), 1969 (2 hobby articles), 1970 (0), 1971 (3 hobby articles), 1972 (0), 1973 (1 hobby article), 1974 (2 hobby articles), 1975 (1 hobby article [a second reference is same as in 1971]), 1976 (3 hobby articles), 1977 (2 hobby articles, one scientific paper). In 1978 there is one scientific reference to *A. ramirezi*, and two popular references to *Papiliochromis ramirezi*. Ornamental fish books published from 1977 onward usually have *Papiliochromis* as the generic name for *Apistogramma ramirezi*, but there are exceptions using *Apistogramma* or *Mikrogeophagus* (e.g., Pinter 1998). Screening a number of available aquarium books from the 1950s suggests that Frey (1957) indeed may be the earliest mention of an alternative classification of *Apistogramma ramirezi*.

Jens Meulengracht-Madsen was a very influential author of aquarium books with several books in Danish that were translated to Swedish and Norwegian and in several different editions and printings. Meulengracht-Madsen used *Mikrogeophagus*, *Mikrogeophagus*, and *Papiliochromis* in different books in the late 1960s and early 1970s

In a book about fish behaviour (Meulengracht-Madsen 1967), the behaviour of *Mikrogeophagus ramirezi* is described on p. 74, however, without any mention of diagnostic generic characters. In this work, *Mikrogeophagus* is a *nomen nudum*.

Meulengracht-Madsen (1973a) is a Swedish version of Meulengracht-Madsen (1971), the latter not seen. On p. 121 is a short description of the breeding behaviour, concluded with the statement: "På grundval av dessa iakttagelser av beteendet hänförde man sedan arten [*Apistogramma ramirezi*] till ett helt nytt släkte, *Mikrogeophagus*. Fjärilsciklidens latinska namn är alltså till [sic] vidare *M. ramirezi*." [On the basis of these observations of the behaviour the species was later referred to a completely new genus, *Mikrogeophagus*. The Latin name of the butterfly cichlid is thus for the time being *M. ramirezi*.] The caption of the photo on p. 122 also uses *Mikrogeophagus ramirezi*. Meulengracht-Madsen (1974) is a Swedish translation of Meulengracht-Madsen (1973b) which latter I have not seen. On p. 86 is a drawing captioned *Mikrogeophagus ramirezi*. There is no further discussion about this species or its name.

Schiøtz & Dahlstrøm (1974) is the second edition of a Swedish translation of a book first published in Danish by Schiøtz & Dahlstrøm (1969). I have not seen the Danish edition or the first edition. On p. 106 is a description of *Mikrogeophagus ramirezi*:

“Denna art kallas i litteraturen vanligen *Apistogramma*, då den liknar detta släkte till utseendet. Den skiljer sig emellertid på väsentliga punkter, nämligen genom att lägga rommen öppet och inte i en grotta och genom att vara monogam, under det att *Apistogramma*-arterna är polygama. Dessa karaktärer gör att det nu uppställts ett eget släkte för denna lilla vackra dvärgciklid.” [This species is usually called *Apistogramma* in the literature because it is similar to that genus in appearance. It differs, however, in critical aspects, namely by laying eggs openly and not in a cave and by being monogamous, while the *Apistogramma* species are polygamous. Because of these characters a proper genus has been erected for this beautiful little dwarf cichlid.]

The passive “has been erected” clearly indicates that the name supposedly has been made available somewhere else. Use of *Microgeophagus* here may thus be considered use of an unavailable name or a misspelling of *Mikrogeophagus*, especially since the text is very similar to that in Meulengracht-Madsen (1974). Additional editions were not searched.

Aurell & Ståhl (1970) in the 11th edition of a standard Swedish aquarium book refers to *A. ramirezi* as “*Microgeophagus ramirézi*, tidigare *Apistogramma ramirézi*”. [Microgeophagus ramirezi, previously Apistogramma ramirezi.] There is no further information beyond the brief description of the species, and the name must be considered a *nomen nudum*, or an incorrect subsequent spelling. The 10th Edition (1968) uses *Apistogramma*. The 12th edition (1973) is identical to the 11th. A later edition authored by Sjölander & Wickman (1976) also uses both *Microgeophagus ramirezi* and *Apistogramma ramirezi*, without further discussion.

Laursen (1972) is a Swedish translation of Laursen (1970, not seen). *Microgeophagus ramirezi* is mentioned on p. 108 and illustrated on p. 109.

Discussion

Involuntary nomenclatural acts in aquarium hobby media. “Mi(c/k)rogeophagus” is not a unique case. There are several instances of available names established by accident in aquarium literature. *Apistogramma reitzigi* Mitsch, 1938, and *Crenicara praetoriusi* Weise, 1935, are examples from South American cichlids (Kullander, 2003). Particular to such descriptions are that (1) the author is unaware that he is describing a new taxon, i.e., the author believes that he is using a name already available, (2) an author of the name is not given, and (3) the name is applied to a species group taxon in an already named genus or a genus group name is associated with an already named species.

None of the instances of *Microgeophagus*, *Papiliochromis*, and *Mikrogeophagus* other than *Papiliochromis* in Kullander (1977) were intended as proposals of a new generic name. It is implicit or clear from the contexts that the authors believe they are using an existing name. Involuntary nomenclatural acts are, however, regulated only from the 1999 Code: “Every new name published after 1999, including new replacement names (*nomina nova*), must be explicitly indicated as intentionally new” (Article 16.1). Strictly, all unintentional nomenclatural acts in hobby literature may be unavailable according to Article 8.1.1 (the work in which the nomenclatural act is published “must be issued for the purpose of providing a public and permanent scientific record”). Hobby publications are non-scientific literature. It is thus entirely questionable why we are discussing or using names dropped in hobby literature and written in an informal style. Tradition has it, however, that names are accepted even if inadvertent, when there is other evidence to support their availability. On the other hand, once such a name has been accepted as valid, later seemingly independent proposals of the same or almost the same name may be considered as normal usage (*cheironyms*) or simple misspellings. Thus, all uses of *Microgeophagus* after 1968 are misspellings of *Mikrogeophagus*.

The problems with these names fall in two categories. First, it is difficult to locate the name or its first publication. Although some ornamental fish magazines are indexed by *Zoological Record*, and other ornamental fish literature provides indices to species descriptions, those descriptions, and other nomenclatural acts, are still difficult to locate, in contrast to scientific publications which are usually well referenced. Beyond what is currently indexed in the *Catalog of Fishes* (Eschmeyer & Fricke 2011), there are probably still nomenclatural acts hidden in magazines of limited circulation. Second, it is often difficult to judge if the name is available or not, and discussions such as in the *Mi(c/k)rogeophagus* case easily arise. Because most of the names in aquarium press sources are given to orna-

mental fishes, they may be accepted or ignored based on criteria favoured by the ornamental fish press and other media, but which may be in conflict with the Code. Aquarists in social media were very fast to cover Isbrücker (2011, in the May issue), embracing the suggested change of name already on 22 April 2011 (cichla 2011). The entry in *Wikipedia* was changed from *Mikrogeophagus* to *Microgeophagus* already on 23 April 2011 (RN1970 2011). Consequently, amalgamated disinformation was being distributed even before Isbrücker (2011) had reached subscribers. More reliable sources, such as the *Catalog of Fishes* (Eschmeyer & Fricke 2011) and *FishBase* (Froese & Pauly 2011) did not change. Unavailable names may thus quickly dissipate into hobby press without any control of sources. Fortunately, this is less likely to occur today with the availability of authorities such as the *Catalog of Fishes* and *FishBase*.

“Microgeophagus” reflecting reliability of aquarium hobby literature. It is quite amazing that the aquarium literature has been able to carry forward all the way from Frey (1957) till at least Schiøtz & Dahlstrøm (1974) the myth of a publication by Wickler that supposedly establishes a new genus for *Apistogramma ramirezi*. In this case we have extensive documentation and we have considerable confidence in that the source referred to does not exist. If this propagation of bibliographic phlogiston is typical of aquarium literature, and it may very well be, it is one very strong reason for aquarium magazine publishers to revise their editorial policies and, as one option, to add a nomenclatural disclaimer to their products (Code Article 8.3).

Relevant to the problematization of *Mikrogeophagus* may be also the discussion, entirely in aquarium magazines, on the natural distribution of *M. ramirezi*. Myers & Harry (1948) did not have precise locality information, but cited collector information that the species was collected south of Palenque in Venezuela. More specific Venezuelan localities, but not vouchered, were reported by a German aquarist in Venezuela (Fischer 1968). Meinken (1967, 1968, 1969) strongly opposed to a Venezuelan distribution, claiming Bolivia as the natural distribution. Meinken’s voucher specimen, however, is a misidentified specimen of *Mikrogeophagus altispinosus* (Haseman) (Kullander 1981), and precise, vouchered localities in the Orinoco basin were reported first by Kullander (1980).

In this context it is interesting to consider the editorial that accompanies Isbrücker (2011). The editorial (Stawikowski 2011) promotes Isbrücker’s article and has the header “Das Ende einer nicht enden wollenden Diskussion” [The end of a discussion that did not want to end] and goes on to explain that the nomenclatural article is published in *DATZ* because most of the earlier discussion about the name of that genus was also held in aquarium literature. Apparently it did not occur to the editor that this was exactly the root of the problem. The issue existed only because of aquarium literature. For some reason the editor also felt the need to highlight the costs and efforts into producing this article. The impression could either be that normally very little effort goes into research and editing, or that this article (Isbrücker 2011) is of outstanding importance.

“Das Erstellen der Titelgeschichte – von der Sichtung sämtlicher relevanten Literaturstellen und deren Bewertung auf der Basis der internationalen zoologischen Nomenklaturregeln bis hin zur Übersetzung des Textes ins Deutsche – hat eine Menge Zeit und Fleiß gekostet.” [The production of the title theme – from the review of all relevant literature sources and their evaluation on the basis of the international zoological nomenclature rules all the way to the translation of the text into German – has cost a lot of time and diligence.]

Despite that the effort in producing Isbrücker’s (2011) article “hat eine Menge Zeit und Fleiß gekostet” out of the nine references other than to the Code, one is an online resource, one is listed as “not seen by myself”, two are not seen at all, and one is inspected from a later edition than the one supposedly carrying the nomenclatural act. And still the author did not list his own publication from 1984 (Isbrücker 1984). The article itself is mainly repeating Géry’s (1983, 1986) discussion. As shown above, the facts and conclusions in Isbrücker (2011) do not live up to expectations for the final countdown for this “issue” and it provides full exposure of journalistic and editorial shortcomings.

This uncritical view of the aquarium press as a valid source of scientific information is not new in 2011. Hebig (1978), listing species descriptions in an East German hobby journal, observed that nomenclatural changes and descriptions are not rare in hobby journals. He notes that these require sometimes long time before they become generally known, and laments that *Zoological Record* is slow in listing aquarium references. It obviously did not occur to him that the difficulty for nomenclatural acts in the hobby press to reach the relevant audience, could be due to hobby magazines being inappropriate for publication of such acts. Aquarium magazines simply have a dif-

ferent target readership. He also notes that "... die Aquaristik einen eigenen wissenschaftlichen Arbeitsstil entwickelt hat" [the aquaristics has developed its own scientific style of working]. His message is very clear:

"Die aquaristische Literatur kann nicht einfach ignoriert werden.[.] Der Fachwissenschaftler kommt nicht umhin, diese zu berücksichtigen, wenn auch mit äußerst kritischen Augen. Das betrifft sowohl neuere wie ältere Literatur." [The aquaristic literature cannot simply be ignored. The professional scientist cannot avoid considering it, albeit with extremely critical eyes. That applies to both new as well as to older literature].

Following the arrests and deportation of aquarists for unauthorized collecting in Brazil in 1999 (Cubas 1999) and their associated publication of new species descriptions in an aquarium magazine, there was for a while open discussion on such practice. The concerned magazine stopped publishing new species descriptions and the business federation Ornamental Fish International published an online policy making recommendations to scientific collections and to hobby journals how to deal particularly with illicit collections but also species descriptions in aquarium literature (Kullander 2000). This was met with strong objections from some parts of the hobby, especially Staeck (2004), who demanded that scientists must cite hobby publications, and claimed that hobby magazines do carry articles of scientific value, similar to Hebig (1978).

Ornamental fish nomenclature. A very large number of organism names are being managed by the aquarium industry. The majority of the commercial target species is probably better known by vernacular names, and standard listings for such names are available (e.g., Hensen *et al.* 2010). There are also formal and informal systems for naming unidentified "species". One strategy is to apply code numbers, which works except that there seems to be some confusion about who is the authority for applying the codes, e.g., the L numbers for the family Loricariidae (Schraml & Schäfer 2004; Stawikowski *et al.* 2003). The more common strategy in other groups is to apply a descriptive or geographical term in quotes after the generic name or sometimes a species name. The "species" thus distinguished by producers and clients, are operational units which are independent of biological concerns and serve only to correlate communication between specific agents, e.g., wholesaler and shop. Codes and informal names can be given to biological species, populations, particular shipments, demes, or colour forms, depending on what need for communication arises. There are no formal agreements on authority for such names, and synonyms are common. Neither the numbering system nor the vernacular names pose any problem for zoological nomenclature, and taxonomists can safely ignore those designations when naming species that already have one or more informal names in the ornamental fish trade. These names are excluded from the provisions of the Code as they are for "temporary reference and not for formal taxonomic use as scientific names in zoological nomenclature" (Code Article 1.3.5).

Numerous ornamental fish species, however, are addressed by scientific names in pet shops, magazines, club meeting reports, price lists, and other texts. Consequently a very large body of uninformed users deal with a very large number of technical names whose use is governed by very specific limitations set out in the Code. Overall, scientific names, vernacular names, code names, and informal names are nevertheless managed smoothly, apparently to the full benefit of both producers and consumers within the aquarium industry. Occasionally, however, there are conflicts. As demonstrated by the results section in the present paper, the aquarium press is notoriously unreliable in its use of scientific names. The problem is not only that errors are being made, but that erroneous information is served continuously, and even highlighted and labelled as science. Although peripheral to the present case, a parallel force of putative science in aquarium literature is the intentional publication of descriptions of new taxa by amateurs, largely fuelled by the *mihi itch* (cf. Evenhuis 2008), especially in the Rivulidae and the Cichlidae, resulting in a significant amount of species descriptions in aquarium magazines with limited distribution, rarely peer review, mostly no relevant editing, and commonly other shortcomings. One striking example is the description in the Dutch ornamental fish magazine *Het Aquarium* by Tomey (1999) of *Badis badis bengalensis* based on specimens still alive in his aquarium. It was later synonymised with *Dario dario* by Kullander & Britz (2002). One German magazine, *Das Aquarium*, now discontinued, published 17 articles describing new taxa from the 1970s till the 2000s (1970s: 5; 1980s: 3, 1990s: 4; 2000s: 5) (counts based on data in Eschmeyer & Fricke 2011). Of these, two seem to have a professional taxonomist as co-author. Stawikowski (2011) notes that new species descriptions are out of place in aquarium magazines, and that there are more suitable professional journals for such articles. The practice seems indeed to have been halted with the demise of *Das Aquarium*.

In the case of *Microgeophagus*, we are thus not only dealing with inadvertent names in the aquarium press, but also a special “aquaristic science with its own style of working”. Isbrücker (2011) and Stawikowski (2011), both write in Hebig’s and Staeck’s spirit. They implicitly demonstrate, however, that Hebig (1978), Stawikowski (2011), and Staeck (2004) are wrong about the scientific qualities of hobby publications. Information in aquarium books and magazines may be entertaining and instructive for aquarists. As sources of information for scientific use they must be filtered, just like all other sources of information, and scientists cannot be expected to have available all of those publications which for the most part only contain irrelevant articles, anecdotal accounts, and advertising. The *Microgeophagus* case demonstrates the point.

This is not to say that all scientific literature is in a perfect state; or that all aquarium press is of no value. On a positive note, it has to be said that ornamental fish literature is usually informative and provides excellent opportunities for popular science. The aquarium hobby is an excellent introduction to biology and environmental awareness issues, and many scientists are ready to contribute with articles. Contrary to claims by Staeck (2004) there is no inherent conflict between science and hobby. There is a problem, however, when the ornamental fish press attempts to run a parallel nomenclature (Stawikowski 2011), and when complaints are raised that articles in hobby literature are not cited as much in scientific literature as their authors would want (Hebig 1978; Staeck 2004). Forty-eight aquarium press sources dealing with *M. ramirezi* and/or its generic name are cited herein (papers by Allgayer, Anonymous, Axelrod, Aurell & Ståhl, Burgess, Fischer, Frey, Géry, Hensen, Hoedeman, Isbrücker, Klee, Laursen, Meinken, Meulengracht-Madsen, Pinter, Scheel, Schiøtz & Christensen, Schiøtz & Dahlstrøm, Schiøtz et al., Sjölander & Wickman, Stawikowski, Wickler). None of them provides a reliable, lasting contribution to science, with reservation for the constructive critical comments by Wickler (1960). The “aquaristic science” is certainly challenged by the perpetuation of disinformation in a long series of articles from Frey (1957) to Isbrücker (2011).

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