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Recent species name changes in the European Lymnaeidae: two tales with unhappy end?

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ABSTRACT. Two doubtful cases of species name replacements in the family Lymnaeidae Rafinesque, 1815 (pond snails) proposed in 1990–2000s are discussed. These are: *Radix labiata* (Rossmäßler, 1835) vs. *R. peregra* (O.F. Müller, 1774), and *Stagnicola fuscus* (C. Pfeiffer, 1821) vs. *S. vulneratus* (Küster, 1862). It is shown that in both instances the name alterations were not based on the conclusive evidence and thus seem to be proposed without substantial reasons. I argue that the name *Radix peregra* cannot be ruled out and replaced by *R. labiata*. The type series of the latter has been identified in collection of the Natural History Museum of Vienna and it is shown that *R. labiata* is a junior synonym of *R. balthica* (Linnaeus, 1758). The lectotype of *Limnaeus pereger* var. *labiatus* Rossmäßler, 1835 is designated. The resurrection of the species name *Limnaeus fuscus* (Pfeiffer, 1821) for application to a certain species of *Stagnicola* is also very doubtful since this name must be treated as a *nomen dubium*, and any taxonomic interpretation of it is inevitable based on more or less reliable hypothesis, not on the total evidence. The replacement of *S. vulneratus* by its alleged senior synonym adds little to our knowledge on lymnaeid taxonomy and evolutionary relationships. It is desirable that the nomenclatorial principle of priority must not be applied to *nomina dubia*.

Introduction

Taxonomic names, especially those applied to species (i.e. Latin binomens), are of great importance not only for biological systematics but also for virtually all branches of life sciences that require a uniform and rigorous reference system for classifying and naming all creatures, great and small. The mnemonic significance of such a system is also obvious and has repeatedly been stressed since the time of Linnaeus [1751]. On the other hand, practicing systematists have a "regrettable" habit to change the names of species from time to time, being obliged to obey the strict and internationally adopted rules of zoological nomenclature such as the 'priority rule' and similar ones [International Commission on Zoological Nomenclature, 1999]. For a layperson, even for an educated one, this permament re-shuffling of scientific names may seem absurd. Many professional biologists (not taxonomists) also express their irritation at this habit, and sometimes it is regarded as one of obvious shortcomings of the contemporary (i.e. post-Linnaean) systematics [Dammerman, 1949; Chaikovsky, 2007]. Indeed, the taxonomic names alterations may influence a wide range of scientific activities, including conservation planning and Red Data lists compiling, comparative analyses in parasitology, data placement to GenBank and other public digital repositories of genetic information. Devoted taxonomists usually see it as the "inevitable evil" rather than a great imperfection [Berio, 1953], but even they demand that any species name changes must be well-founded and based on as strong evidence as possible. Being short, we are permitted to change taxonomic names deliberately, but not in a capricious and subjective manner.

This long tirade is the preamble for the subsequent and much more technical discussion of two concrete cases of recent name replacements involving two common European species of lymnaeid snails (family Lymnaeidae Rafinesque, 1815). The family is thought to be presented in Europe by a few species [Jackiewicz, 1998a; Falkner *et al*., 2001; but see Kruglov, 2005], and its species composition has been extensively studied since Linnaeus [1758] and Müller [1774]. However, even in such well-known group of continental mollusks as European Lymnaeidae at least four species name replacements were adopted during the last two decades.

Two of these recent novelties were based on a thorough study of all possible evidence, including

examination of the type series, and seem not to be problematic. The first of the two cases concerns the species *Radix* (or, alternatively, *Lymnaea*) *ovata* (Draparnaud, 1805) once thought to be among the most common and widely distributed lymnaeids in Europe and Northern Asia [Westerlund, 1885; Geyer, 1927; Zhadin, 1952]. In the early 2000s, Falkner *et al*. [2001, 2002] proposed to replace the commonly used name *Radix ovata* with the oldest available one, *R. balthica* (L., 1758), described from the Gotland Island, Sweden. This replacement has been widely supported and it is almost universally accepted today [Schniebs *et al*., 2011; Welter-Schultes, 2012; Glöer, 2015]. A comparison of the neotype of *R. balthica* (designated by Kruglov and Starobogatov, 1983) with the syntype of *Limneus ovatus* Draparnaud (Fig. 1) shows the correctness of this synonymization [see Vinarski, Eschner, 2016 for further details].

The second case is that of the pair of species *Stagnicola occultus* (Jackiewicz, 1959) – *S. terebra* (Westerlund, 1885). Having studied the type materials of the two taxa, Vinarski and Glöer (2008) demonstrated their conspecificity and proposed to use the second name as being the oldest available one. Currently this species is placed to the genus *Ladislavella* B. Dybowski, 1913 [see Vinarski, 2012 for details].

Two other recent cases of species name change in European Lymnaeidae, albeit supported by European taxonomists [Glöer, 2002, 2015; Welter-Schultes, 2012], are much more problematic and should be discussed anew. These two instances are:

Radix labiata (Rossmäßler, 1835) vs. *R. peregra* (O.F. Müller, 1774) and *Stagnicola fuscus* (C. Pfeiffer, 1821) vs. *S. vulneratus* (Küster, 1862).

In my opinion, in both cases we are dealing with the same problem – how to treat taxonomically the numerous *nomina dubia* produced intensively (and unintentionally) by conchologists of the 18th–19th centuries, whose standards of species descriptions were very far from the modern ones. I will argue that the *objective* decision concerning application of a given *nomen dubium* to a certain species of snails recognized by modern systematists is usually impossible, and the rival *interpretations* of the same taxonomic name should be weighted in order to determine which one is more plausible and promotes the taxonomic stability rather than disturbs it. Also, some objections against the most rigorous application of the nomenclatorial rule (or law) of priority are presented.

Material and methods

In the course of my taxonomic work on Eurasian Lymnaeidae, I examined numerous samples of pond snails housed in several large repositories:

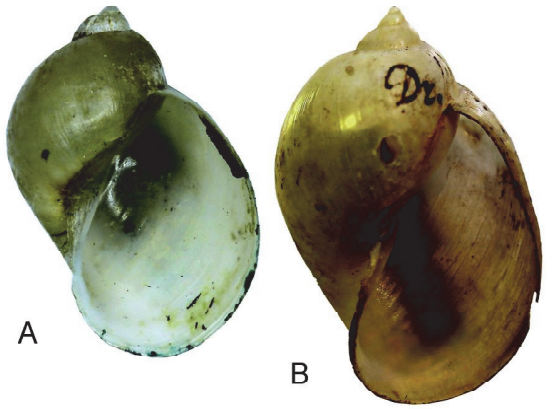

FIG. 1. Shells of the type specimens of *Radix*. **A.** *Radix balthica*, the neotype, ZIN No. 1, shell height = 9.8 mm. **B.** *Radix ovata*, a syntype, NHMW No. 14737, shell height = 21.7 mm.

РИС. 1. Раковины типовых экземпляров двух видов *Radix*. **A.** *Radix balthica*, неотип, ZIN No. 1, высота раковины = 9.8 mm. **B.** *Radix ovata*, синтип, NHMW No. 14737, высота раковины = 21.7 mm.

1. ZIN – Zoological Institute of the Russian Academy of Sciences, Saint-Petersburg, Russia.
2. ZMUC – Zoological Museum, Copenhagen Universitet, Denmark.
3. NHMW – Natural History Museum Vienna, Austria.
4. NMG – Natural History Museum Gothenburg, Sweden.
5. ZMB – Natural History Museum Berlin, Germany.
6. LMBI – Laboratory of Macroecology and Biogeography of Invertebrates, Saint-Petersburg State University, Russia.

During my study, I focused primarily on examination of samples having a historical value, i.e. containing specimens identified by prominent zoologists of the past (O.F. Müller, C.A. Westerlund, E. von Martens, S. Clessin and others). Doing so, I tried to ascertain the identity of taxonomic names introduced by ancient conchologists that is not rarely unclear from the original descriptions. Extensive search through old literary sources was made possible by using two "material" (ZIN, NHMW) and one "virtual" (Biodiversity Heritage Library, http://www.biodiversitylibrary.org/) libraries.

Results

The *nomina dubia* in lymnaeid taxonomy

The International Commission on Zoological Nomenclature [1999] defines the term "nomen dubium" as a "name of unknown or doubtful application". Indeed, this definition is not very strict, and any decision about doubtfulness of one or another taxonomic name will inevitably be dependent on a taxonomist's personal judgement, not free from some degree of subjectivity. Moreover, the criteria

of doubtfulness may vary in different taxa of animals. I feel it useful to list below some characteristics of old species names in lymnaeids and other groups of freshwater snails that allow their classification as "*nomina dubia*". No less than three criteria of doubtfulness are imaginable:

1. The type series of a species is lost and the topotypes are unavailable (for example, because of the type locality exists no longer or became unsuitable for snails)[1];

2. The original description and the original shell illustration (if present) are too vague and uninformative to secure the unambiguous taxonomic application of a name;

3. The neotype was not established by any subsequent reviser.

These three criteria may be summarized in a single phrase: **any hypothesis concerning the taxonomic identity of a *nomen dubium* is necessarily grounded on indirect evidences and as such is not testable (in the scientific sense)**.

Typically, the *nomina dubia* occur in such genera (or subgenera) of lymnaeids that include two or more closely allied species characterized by more or less pronounced conchological variation. The genera *Radix* Montfort, 1810 and *Stagnicola* Jeffreys, 1830 may serve as good examples of such groups. In the two taxa, the shell characters are so plastic both within and among species that their use for species delineation may be absolutely misleading. The anatomical and genetic data, completely unavailable for conchologists of the 18th–19th centuries, are therefore crucial for reliable identification of these snails [Jackiewicz, 1993, 1998a, b; Schniebs *et al*., 2011].

I should admit that the three criteria outlined above may seem too strict, and, following them, some taxonomic names of common use fall under suspicion. Among European lymnaeids, such widely used binomens as *Stagnicola corvus* (Gmelin, 1791) and *Radix lagotis* (Schrank, 1803) fit these criteria, that impedes their interpretation by today's taxonomists but, however, does not preclude their wide usage. In my opinion, although, systematists have to manage such names very carefully, and the strict application of the ICZN priority rule must be relaxed when we are dealing with *nomena dubia* (see Discussion). The two practical cases discussed in next chapters represent a good illustration for it.

The case of *Radix labiata* – *R. peregra*

The taxonomic name *Radix peregra* was among the most habitual and commonly used lymnaeid names during the 19th–20th centuries. Until 2001, it was accepted by all malacologists regardless of their views on how to delineate species in this family. Both lumpers [Hubendick, 1951; Jackiewicz, 1998a] and splitters [Kruglov, Starobogatov, 1983, 1993] included it into their species lists though the identity of this binomen has been viewed very differently. In 1953, the name *Buccinum peregrum* O.F. Müller, 1774 was placed into the ICZN list of conserved names (opinion 336). However, as it is shown below, *Buccinum peregrum* is a typical *nomen dubium* liable to different interpretations.

In 2001–2002, a group of German and Dutch zoologists [Falkner *et al*. 2001, 2002] proposed to stop the use of the name *R. peregra* in favour of a long-forgotten one, *Radix labiata*. At the first glance, it looks as a violation of the nomenclatorial 'priority law' since *R. labiata* was introduced 60 years after *R. peregra.* Shortly, the argumentation of Falkner *et al*. [2001, 2002] was as follows.

Living specimens of *R. peregra* are absent in the type locality – Copenhagen, Denmark ("hortus fridrichsbergensis", i.e. Frederiksberg Park in Copenhagen City) and, probably, in entire Denmark. Bargues *et al*. [2001], in their molecular study, found that, excluding *R. auricularia* (L., 1758), there is only one species of *Radix* in Northern Europe that corresponds presumably to the Linnaeus' species *Helix balthica* (*Radix balthica* of current taxonomy). All *R. peregra* identified genetically by Bargues *et al*. [2001] were collected in Czech Republic, southern Germany, and Turkey. Thus 'true' *R. peregra* does not live in Denmark, and therefore Müller [1774], most probably, had specimens of another species, *R. balthica*, which served him as the material for description of a new species. Then, *Buccinum peregrum* sensu Müller [1774] is nothing but *Helix balthica* sensu Linnaeus (1758). However, since the type series of *B. peregrum* is lost [Nekhaev *et al*. 2015], this hypothesis is virtually untestable.

The oldest available name found by Falkner *et al*. [2002] to replace *R. peregra* auct. was *Limnaeus pereger* var. *labiatus* Rossmäßler, 1835 (type locality: Germany, Saxony, vicinity of Tharandt Town). Originally, this name was introduced to label a certain conchological deviation from the "type", namely, var. *labiatus* denotes *L. pereger* with a "shell furnished with a distinct rib near the margin of the outer lip" [Taylor, 1891]. According to Rossmäßler [1835], this trait is weakly expressed in the typical variety. The illustration in Rossmäßler's work [1835, fig. 54] represents a shell of the typical variety only.

Remarkably, Falkner *et al*. [2002] provided no information concerning the type series of *Limnaeus pereger* var. *labiatus* and, presumably, did not exa-

[1] In many cases even extant type series of shell-bearing gastropods proved to be too uninformative to offer an unambiguous solution concerning taxonomic identity of a taxon described 150-200 years ago [Bouchet, Strong, 2010].

mine the types considering them to be lost or destroyed. Nevertheless, their proposition has gained a wide support among Western European malacologists, and the species name *R. labiata* is used in all recent publications [Anderson, 2005; Welter-Schultes, 2012; Schniebs *et al*., 2013; Glöer, 2015], except of those by Russian authors still preferring *R. peregra* as a valid species name [Kruglov, 2005; Andreeva *et al*., 2010; Vinarski, Kantor, 2016]. Some authors [Frogley, Preece, 2007] tried, however, to contest this usage appealing to the fact that *Buccinum peregrum* is a member of the ICZN "conserved names" list. As Kadolsky [2011] has stressed it out, it is not "conserved" thereby; the relative precedence of the names *peregrum* Müller 1774 and *balthica* Linnaeus 1758 is still governed by the principle of priority (Article 80.6.4 ICZN) and the conservation of a binomen does not preclude its treatment as a junior synonym of an older name.

I have to note, however, that the hypothesis promoted by Falkner *et al*. [2001, 2002] has other shortcomings listed below.

1. The absence of both type series and topotypes does not preclude the usage of an old taxonomic name (see above).

2. Today's absence of *R. peregra* in the waterbodies of Copenhagen does not mean that it was absent there in the Müller's time. The species composition of a local molluscan community may change over time due to such events as species extinctions and introductions, and numerous examples of such changes have been documented. For instance, Baur and Ringeis [2002] reported considerable alterations in aquatic gastropod fauna of waterbodies of vicinities of Basel (Switzerland) happened between 1906 and 1994. One species, *Aplexa hypnorum* (L., 1758), was found to disappear totally from the region. I wish also to recall the recent exctinction of *Myxas glutinosa* (O.F. Müller, 1774) in most waterbodies of Great Britain. Killeen [1992: 56] states that the species "seems to have virtually disappeared from Britain". Both regional extinctions reported above have happened at the timescale of about 100 years. Furthermore, invasions of the non-indigenous species may be responsible for drastic and very fast alterations of the freshwater molluscan communities [Mouthon, Magny, 2014]. Having visited Lake Furesø (in vicinities of Frederichsdahl, a suburb of Copenhagen, the type locality of many species described by O.F. Müller) in July of 2014, I recorded the presence of at least two alien species of mollusks there, *Dreissena polymorpha* (Pallas, 1771) and *Potamopyrgus antipodarum* (Gray, 1843). Though my stay in this area was very brief and I was not able to make quantitative observations on mollusk species abundances, the shells of *Dreissena* were the most abundant and their empty valves formed a true 'belt' on the shores of the Furesø

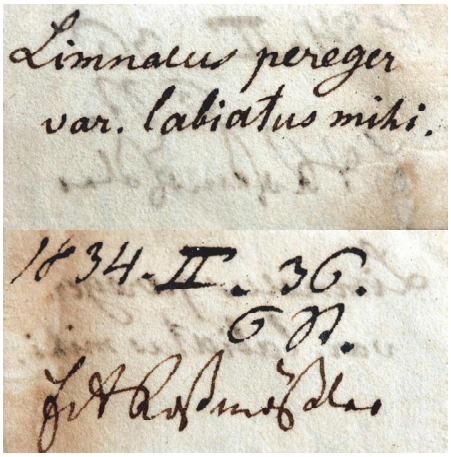

FIG. 2. The original label of the sample of *Limnaeus pereger* var. *labiatus* identified by Rossmäßler, NHMW. View from two opposite sides.

РИС. 2. Оригинальная этикетка, сопровождающая выборку *Limnaeus pereger* var. *labiatus*, идентифицированную Россмесслером, NHMW. Приведен вид с обеих сторон этикетки.

Lake. Apparently, both invaders established their populations in the waterbody long after Müller's death. A century ago, *Dreissena* was already present there [Steenberg, 1917], whereas *Potamopyrgus* may have been introduced much later.

3. Among specimens of *Radix* spp. studied genetically by Bargues *et al*. [2001], most individuals were sampled in France. No specimen of *Radix* from Denmark was sequenced. The only individual in their sample that may be regarded as "north European" originated from Iceland (it proved to be *R. balthica*). It would be very premature to infer from such a geographically limited sample that *R. peregra* does not occur in Denmark or in entire North Europe.

4. Falkner [1984] published a paper devoted to the study of freshwater snails in Fridrichsdahl, the type locality of many molluscan species described by Müller in 1774 [Nekhaev *et al*., 2015]. However, no published information about recent molluscan fauna of Frederiksberg in Copenhagen (type locality of *Buccinum peregrum*) is known to me.

Thus, I cannot agree with Falkner *et al*. [2002] that Müller [1774] had specimen of *R. balthica* sensu Linnaeus, 1758 and described it under the new name *Buccinum pereger*. It is possible, but the evidences presented by Falkner *et al.* [2002] are not conclusive.

However, the strongest argument against replacement *R. peregra* with *R. labiata* results from the study of the type specimens of the latter. Working with NHMW malacological collection, I managed to find a sample of eight shells labeled as "*Limnaeus pereger* var. *labiatus* mihi", with the determinator's signature that may be deciphered as

E.A. Rossmäßler's (Fig. 2). The inscription "mihi" (the dative of the Latin "ego") is very important. In the 19th century it usually accompanied descriptions of new taxa and served as an indication that the taxon is proposed for the first time [Evenhuis, 2008]. I suggest that the eight shells (Fig. 3) may have been originated from the type series or, at least, were determined by Rossmäßler himself and, thus, reflect his own notion of "var. *labiatus*". According to Dance [1966], Rossmäßler's malacological collection is housed in Senckenberg Museum, Germany, however I was informed that the type materials of *L. pereger* var. *labiatus* are kept there no longer (P. Glöer, pers. comm.). It means that the NHMW sample may constitute the only survived part of the type series.

The eight shells of the NHMW sample belonged to subadult animals; the maximum shell heigth in the sample is 14.4 mm (Table 1). All shells look uniform, being of ovoid shape, with short conical spire and rounded whorls. Conchologically, these specimens resemble juvenile *R. balthica* (compare Figs. 1 and 3) rather than *R. peregra* (Fig. 4) and, judging from my experience with variation in *R. balthica* from different points of Europe and Siberia (partly published in Schniebs *et al*., 2011), I am inclined to consider *L. pereger* var. *labiatus* Rossmäßler, 1835 as a junior synonym of *R. balthica* and hereby designate one of the survived shells (the left shell in Fig. 3) as its lectotype (NHMW, No. 110172). The rest of the syntypes become paralectotypes (NHMW No. 110173).

Of course, given the loss of the type series of *Buccinum peregrum* it is extremely difficult to define what the "typical" *R. peregra* should be. The oldest survived sample of *R. peregra* that I managed to find is that from Draparnaud's malacological collection (kept now in NHMW; see Vinarski, Eschner, 2016). Using Müller's description, Draparnaud *could* correctly identify *R. peregra* and did not confuse it with *R. balthica* (his *Limneus ovatus*). The shells determined by Draparnaud himself as *Limneus pereger* (see Fig. 4) were collected somewhere in France, possibly, in the end of the 18th–first years of the 19th century. Their conchological characteristics more or less correspond to those ascribed to *Radix peregra* by the authors of the last century [for instance, Ehrmann, 1933]. *R. pereger* sensu Ehrmann has a high-spired shell with apparently convex whorls (not flattened and rounded as in *R. balthica*) and does not correspond to the syntypes of *L. pereger* var. *labiatus* (compare figs. 3 and 4). The genetically identified individuals of *R. peregra / labiata* (see Schniebs *et al*., 2013, fig. 4) resemble both Draparnaud's shells and shells depicted by Ehrmann but are somewhat different from the type series of *L. pereger* var. *labiatus*.

Also, some cues were provided by Müller [1774] himself in the original description of *B. peregrum*. Though he gives no picture of shell, he quoted Gualtieri [1742, pl. V, fig. c, e] as a reference for his *B. peregrum*. Gualtieri [1742] depicts two shells[2], one of them [pl. V, fig. c] is high-spired with many whorls and resembles *R. peregra* sensu Ehrmann. However, the illustrations provided by Gualtieri [1742] are too crude to base any definite opinion on them.

Furthermore, Müller [1774] noted that his *Buccinum peregrum* is an amphibiotic species, ecologically similar to amber snails (Succineidae). It is entirely not characteristic for *R. balthica*, whereas *R. peregra* s. str. is known to inhabit temporary waterbodies predominantly and can be found in muddy shallow zones of small lakes or in swamps (Vinarski, pers. observations).

Table 1. The morphometric characteristics of the syntypes of *Limnaeus pereger* var. *labiatus* (NHMW). Above lines – limits of variation, below the lines – means ± standard deviations

Таблица 1. Морфометрическая характеристика синтипов *Limnaeus pereger* var. *labiatus* (NHMW). В числителе – границы изменчивости, в знаменателе – средние значения ± значения среднеквадратического отклонения

Character / index	Values
Whorls number	4.00 – 4.37 4.17 ± 0.14
Shell height (SH), mm	12.5 – 14.4 13.7 ± 0.5
Shell width (SW), mm	7.7 – 8.8 8.4 ± 0.4
Spire height (SpH), mm	4.8 – 5.8 5.4 ± 0.3
Body whorl height (BWH), mm	10.6 – 12.1 11.7 ± 0.5
Aperture height A(H), mm	7.9 – 9.0 8.7 ± 0.5
Aperture width (AW), mm	5.0 – 6.1 5.7 ± 0.3
SW/SH	0.57 – 0.64 0.61 ± 0.03
SpH/SH	0.35 – 0.41 0.39 ± 0.02
BWH/SH	0.84 – 0.88 0.85 ± 0.01
AH/SH	0.61 – 0.69 0.63 ± 0.01
AW/AH	0.62 – 0.70 0.66 ± 0.03

[2] Freely available online at: http://gdz.sub.uni-goettingen.de/dms/load/img/?PPN=PPN367583143&IDDOC=282884

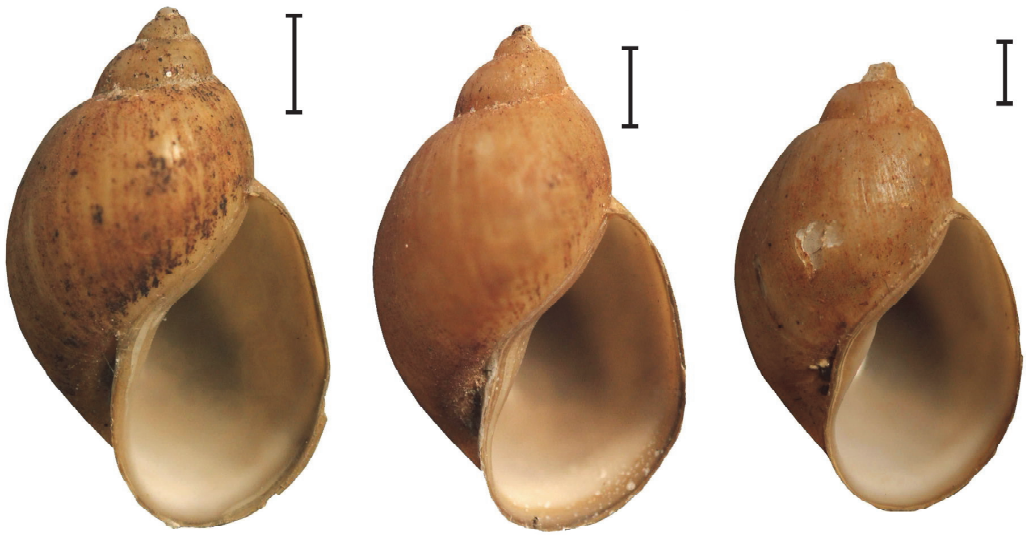

FIG. 3. The three syntypes of *Limnaeus pereger* var. *labiatus*, NHMW Nos. 110172 and 110173. The left shell is designated here as the lectotype. Scale bars 2 mm.

РИС. 3. Три синтипа *Limnaeus pereger* var. *labiatus*, NHMW № 110172 и № 110173. Крайняя левая раковина обозначается здесь как лектотип. Масштабные линейки 2 мм.

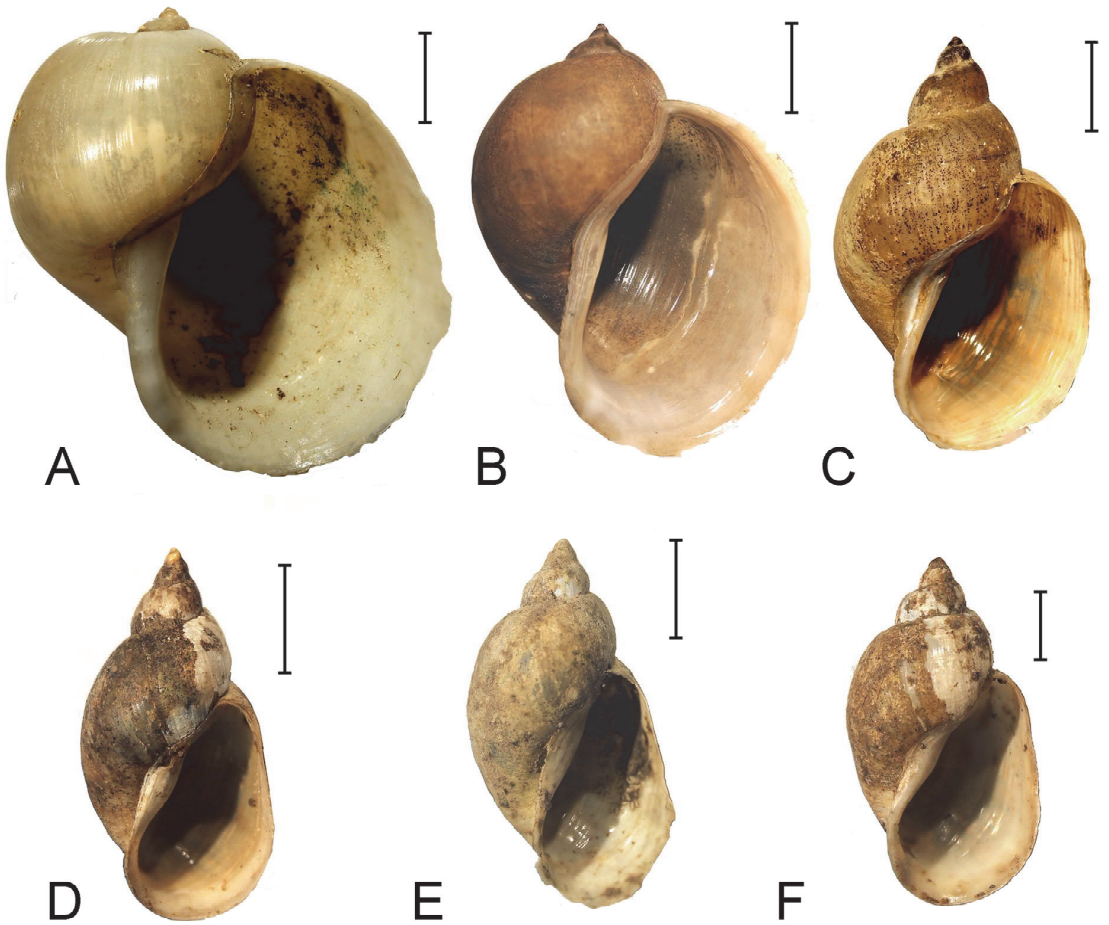

FIG. 4. Shells of different *Radix* species collected in Denmark (ZMUC). **A.** *Radix ampla* (Hartmann, 1821), Furesø Lake. **B.** *R. balthica*, Frederiksborg. **C.** *R. lagotis* (Schrank, 1803), Amager Føller, Copenhagen. **D-F.** *R. peregra*, Dammussøn, Copenhagen. Scale bars 5 mm.

РИС. 4. Раковины различных видов *Radix*, собранные в водоемах Дании (ZMUC). **A.** *Radix ampla* (Hartmann, 1821), оз. Фуресё. **B.** *R. balthica*, Фредериксборг. **C.** *R. lagotis* (Schrank, 1803), Amager Føller, Копенгаген. **D-F.** *R. peregra*, Dammussøn, Копенгаген. Масштабная линейка 5 мм.

To learn if *R. peregra* occurs in the Danish waterbodies, I examined a large series of lymnaeid samples from this country kept in ZMUC. Indeed, the great majority of *Radix* specimens proved to belong either to *R. auricularia* or to *R. balthica*, but I managed to identify some samples containing shells corresponding with *R. peregra* sensu Ehrmann. For example, three shells collected in 'Damhussøen, Kobenhavn' (i.e. very close to the locus typicus of *B. peregrum*) in 1903 seem to be identical with *R. peregra* sensu Ehrmann (see fig. 4). The shells share their characters with shells of *R. peregra* from Draparnaud collection: ovate-conical shape, visibly convex whorls, relatively high spire. As compared with specimens of other *Radix* species collected from the Danish waterbodies, *Radix* from Damhussøen are smaller that corresponds to relatively small absolute size reported to this species [Andreyeva *et al*., 2010; Vinarski *et al*., 2016].

The northernmost locality of *R. labiata* presented on a map in the latest edition of the guide for freshwater Mollusca of Germany by Glöer [2015] lies approximately on the boundary between Denmark and Germany, roughly 250 km SW from Copenhagen. Remarkably, in the previous edition of this guide [Glöer, Meier-Brook, 2003] this locality was not indicated on a corresponding map that may indicate a relatively recent finding of the species.

To summarize the discussion above, I believe that there is no the decisive evidence that *R. peregra* is absent in Denmark (or, at least, was absent there during Müller's life). Due to the type series loss, we, most probably, will never learn the true identity of Müller's *Buccinum peregrum*. It is a clear *nomen dubium*. However, for the sake of the stability and continuity of zoological nomenclature it is most desirable to retain the common name, *R. peregra*, since the facts do not contradict its traditional application (= *R. peregra* sensu Ehrmann). Anyway, the binomen *R. labiata* cannot be used as a replacement name for *R. peregra* since its type series is represented by shells belonging to a quite different species.

The case of *Stagnicola fuscus* – *S. vulneratus*

The species *Limnaeus vulneratus* was described by Küster [1862], with the Cetina River in Croatia (in vicinities of Omiš Town) as its *locus typicus*. Though the autor gave a relatively detailed description of *L. vulneratus* shell and depicted it on a colour plate, this information is not enough to distinguish the species from other European members of *Stagnicola*. The anatomical structure has been regarded as the main source of taxonomic signal in this genus [Jackiewicz, 1993, 1998b], whereas the shell characters are often quite misleading. Though some authors accepted *S. vulneratus* as a distinct species [Locard, 1893; Kobelt, 1912; Pieper, Willmann, 1978; Kruglov, Starobogatov, 1986] other malacologists did not include it into the European malacofauna [Hubendick, 1951] considering *S. vulneratus* as a synonym of *S. palustris* (O.F. Müller, 1774).

The first attempt to characterize *S. vulneratus* anatomically was undertaken by Jackiewicz [1962] in her study based on examination of snails collected in Bulgaria. According to Jackiewicz [1962], the species is characterized by relatively long penis sheath and prostate with a single inner fold. Later on, she rejected her own earlier interpretation and, after anatomical examination of specimens collected in the Cetina River near Omiš, re-described *S. vulneratus* as a species having very short and narrow penis sheath and two folds within prostate [Jackiewicz, 1988]. It makes *S. vulneratus* sensu Jackiewicz 1988 morphologically closer to *S. corvus* (Gmelin, 1791) than to *S. palustris*.

A quite different interpretation of this species was proposed by Kruglov and Starobogatov [1986] in their revision of the Old World *Stagnicola*. The Russian malacologists examined 10 specimens of snails collected in Poland and determined *Limnaeus vulneratus* Küster, 1862 as a senior synonym of Central European species *L. occulta* (Jackiewicz, 1959). The anatomical structure of *Lymnaea* (*Stagnicola*) *vulnerata* sensu Kruglov and Starobogatov [1986] is very different from that in *L. vulnerata* sensu Jackiewicz, 1988, but the latter interpretation has to be preferred as Kruglov and Starobogatov [1986] did not study topotypic specimens and the reasons of synonymization between *L. vulneratus* and *L. occulta* were strictly conchological (Kruglov and Starobogatov 1986). Now *Lymnaea* (*Stagnicola*) *vulnerata* sensu Kruglov and Starobogatov [1986] is regarded as a synonym of *Ladislavella terebra* (Westerlund, 1885) [see Vinarski, 2003, 2012].

Jackiewicz [1996, 1998b] reported anatomically supported findings *L. vulnerata* from Sweden, southern Germany (Baden-Württemberg) and France (vicinity of Toulouse) that implied its rather wide distribution in Europe. Later on, it was found in the British Isles [Carr, Killeen 2003; as *Stagnicola fuscus*].

Nevertheless, it is impossible to find the taxonomic name *Stagnicola vulneratus* (or *Lymnaea vulnerata*) in the most recent publications of Western European malacologists devoted to lymnaeid snails [Falkner *et al*., 2001, 2002; Glöer, 2002, 2015; Welter-Schultes, 2012]. Their authors unanimously use another name, *S. fuscus* (C. Pfeiffer, 1821), for designation of this species. Glöer and Meier-Brook [1994] and Falkner [1995] were the first authors to act in such manner though Jackiewicz [1998b: 419] made a strong protest against

it, stating that the change of name «is injustified and it introduces useless disorder". She insisted that Pfeiffer had juvenile shells of a certain *Stagnicola* in his hands, and it is impossible to judge on the structure of their reproductive system that is crucial for the taxonomy of this genus. Also, Jackiewicz [1998b] suggested that the type locality of *S. fuscus*, the floodplain garden (Auegarten) near Cassel does exist no longer, and, moreover, the species content of the malacofauna of vicinities of Cassel could be completely changed since the Pfeiffer's time.

Falkner *et al*. [2002] responded that *S. fuscus* (defined anatomically) is virtually the only species of *Stagnicola* living today in the neighbourhood of Cassel (though the true type locality is indeed lost completely) that gives them a ground to attach the Pfeiffer's binomen to a snail common there. Much earlier, Diemar [1880], in his survey of mollusks of Cassel, intepreted *S. fuscus* as a probable variety of *S. palustris*, not as a separate species. He admitted that the 'typical' form of the latter is virtually absent in Cassel, whereas snails described by C. Pfeiffer as *L. fuscus* still live in this area.

The case of *S. fuscus* vs. *S. vulneratus* looks more problematic than the case of *R. peregra* vs. *R. labiata*. I agree with Falkner *et al.* [2002] that it is very possible that *L. vulneratus* is not the oldest available name for a widespread in Europe lymnaeid species, and that it had been described several times before Küster [1862]. It is quite probable that Pfeiffer [1821] had juvenile specimens of this species in his collection and based the new species description on them. The type series of both *Limnaeus fuscus* and *L. vulneratus* are lost now, that makes impossible any definite opinions on the identity of the original specimens served to describe these taxa. One need to 'weigh' the two competing interpretations both based on anatomical examinations of presumably topotypic specimens.

I have to express here my personal opinion that it is utterly impossible to define, whose interpretation of a *nomen dubium* is more correct. Both Jackiewicz [1988] and Falkner *et al.* [2002] based their solutions on specimens collected in (or in close vicinities of) the type localities, though nobody may say surely that snails examined anatomically by modern authors are conspecific with those served to older conchologists to introduce new taxonomic names. To put it simply, a claim "*S. fuscus* is the only *Stagnicola* species found in vicinities of Cassel today" is not equal to say "*S. fuscus* was the only *Stagnicola* species living in vicinities of Cassel 200 years ago". At least, the second statement is not testable in scientific sense. It is quite probable but it does not constitute the direct evidence like that based on the study of the syntypes of *Limnaeus pereger* var. *labiatus* (see previous chapter).

The shell illustration of *Limnaeus fuscus* provided by Pfeiffer [1821: pl. IV, fig. 25] is of such generalized appearance that gives us almost no information about species identity. This picture may be applied to almost every species of *Stagnicola* of Europe, and it is not surprising that practicing malacologists of the 19th and 20th centuries did not reach a common interpretation of this species name. Shells determined by various experts as belonging to *Limnaea* (or, *Stagnicola*) *fusca* are very different in their shape, size, coloration, whorls number and so on (Fig. 5).

I have to agree with Jackiewicz [1998b] and conclude that Falkner *et al.* [2002] did not presented the total evidence in support of their interpretation, and the species name change proposed by them was at least premature and contributed nothing essentially new to our knowledge of lymnaeid taxonomy. Whether *Limnaeus fuscus* sensu Pfeiffer [1821] is identical to *Stagnicola fuscus* sensu Falkner *et al*. [2002] will ever remain a puzzle with no exact answer.

Discussion

Falkner *et al.* [2002] explained their action by obligation to obey the principle of priority (PrP), still one of the most fundamental rules of zoological nomenclature [ICZN, 1999]. This principle and its limitations and consequences are currently discussed by both botanists and zoologists [Dubois, 2010, 2011; Pavlinov, 2015; Smith *et al*., 2016]. The history of origin of the rule and its reception by systematists of the 19th century was presented in recent publications by Dayrat (2010) and Pavlinov (2015) as well as in those written by older authors (Lewis, 1875).

PrP demands to discover the earliest available name for every species and to use it exclusively thereby suppressing the application of all its junior synonyms (excluding some exceptional instances provided by the Code; see Article 23.9, for instance). Perhaps A.P. de Candolle, the Swiss botanist, was the first author who, in 1819, proposed to use the older available name in order to maintain the nomenclatorial stability and continuity [Pavlinov, 2015]. Later on, Strickland [1835, 1837], the English naturalist, placed PrP as a cornerstone of the nomenclature code known as the Strickland Code. In the middle of the 19th century, most zoologists in Europe accepted PrP as one of the most important "laws" of nomenclature [Martens, 1864; Lewis, 1875].

On the other hand, as it turned out soon after, the strict application of PrP did not bring stability and continuity to zoological nomenclature. Quite

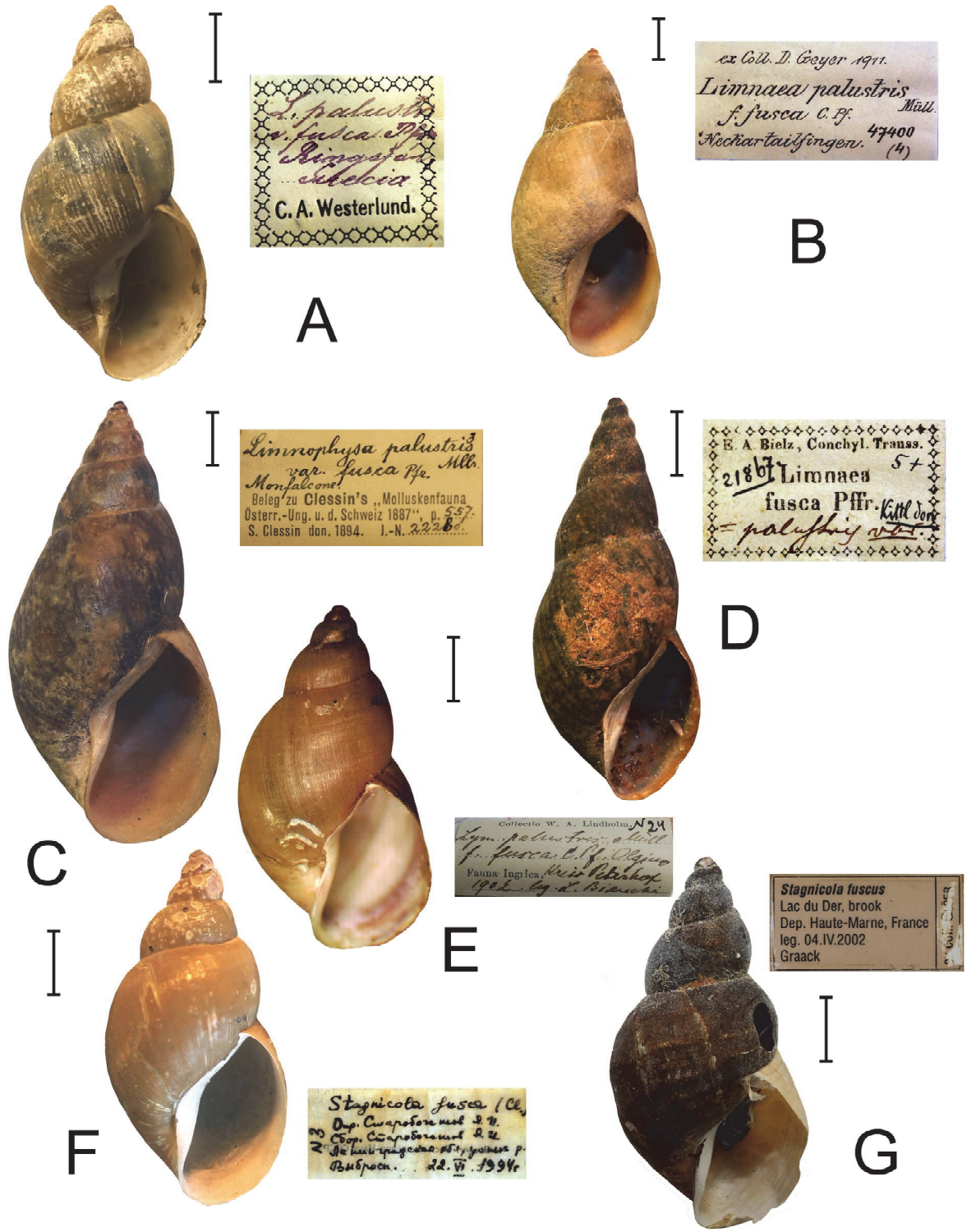

FIG. 5. Shells of *Lymnaea* (or, *Stagnicola*) *fusca* determined by European malacologists of the past. **A.** Sweden, Ringsjцn Lake, det. C. Westerlund (NMG). **B.** Germany, Baden-Wьrttemberg, Neckartailfingen, det. D. Geyer (NHMW). **C.** Italy. Monfalcone, det. S. Clessin (NHMW). **D.** Romania, Transsylvania, det. E.A. Bielz (NHMW). **E.** Russia, Leningrad Region, Olgino settlement, det. W.A. Lindholm (ZIN). **F.** Russia, Leningrad Region, mouth of the Luga River, det. Ya.I. Starobogatov (ZIN). **G.** France, Haute-Marne department, Lake of du Der, a brook, det. P. Glцer (LMBI). Scale bars 2 mm.

РИС. 5. Раковины *Lymnaea* (или *Stagnicola*) *fusca*, идентифицированные европейскими малакологами прошлого. **A.** Швеция, оз. Рингшьон, det. К. Вестерлюнд (NMG). **B.** Германия, Баден-Вюртемберг, Неккартайльфинген, det. Д. Гейер (NHMW). **C.** Италия, Монфальконе, det. Ш. Клессин (NHMW). **D.** Румыния, Трансильвания, det. Э.А. Бильц (NHMW). **E.** Россия, Ленинградская обл., пос. Ольгино, det. В.А. Линдгольм (ZIN). **F.** Россия, Ленинградская обл., устье р. Луга, det. Я.И. Старобогатов (ZIN). **G.** Франция, департамент Верхняя Марна, оз. Дер-Шантекок, ручей, det. П. Глоэр (LMBI). Масштабные линейки 2 мм.

contrary, it "has been brought into great confusion" [Martens, 1864: 247] since a number of taxonomic names of unclear identity were resurrected to replace their assumed junior synonyms of common use [Lewis, 1875]. The taxonomic literature of the past, especially entomological, is full of pleas to limit the strict use of PrP [Schaum, 1862; Le Conte, 1874; Lewis, 1875; Boulenger, 1908; Dammerman, 1949]. Among malacologists, vigorous voices against the "abuses of the law of priority" were also not rare [Carpenter, 1864; Martens, 1864]. There was a group of authors, who accepted the law of priority "with limitations", avoiding extremities that may be induced by its rigorous use [Carpenter, 1864]. One of the most prominent malacologists of the 19th century, Eduard von Martens of Berlin, noted that "the law of priority has been established in Zoology in order to prevent unnecessary innovations and changes in nomenclature and *to give this a certain stability, but not to overthrow names familiar to every zoologist* and consecrated by the use of half a century, in favour of others proposed perhaps only a few years previously to their establishment by some obscure writer" [Martens, 1864] (italics added by me).

Remarkably that today, 150 years later, practicing systematists note that recovering and recording long overlooked names for the sake of strict adherence to the law of priority «unnecessarily destabilizes taxonomy for purely nomenclatural reasons" [Smith *et al*., 2016].

The problem is that many taxonomic names introduced in the 18th and 19th centuries are hopelessly unrecognizable (see above), and I feel that an advice given as long ago as in 1874 is still usepful. Le Conte (1874: 201-202) recommended taxonomists to "*resist innovation*, unless the innovator presents to you the reasons for his proposed change, with such force as to convince your judgment… The law of priority must be adhered to, so far as the interests of science make it practicable". The ICZN [1999] article 23.9 follows this position and lists several circumstances when the strict use of PrP can be violated.

In my opinion, a resurrection of an old and doubtful species name on the basis on indirect evidence (as in the case of *S. fuscus*) must not be accepted unless it represents a substantial contribution to stability and usefulness of zoological nomenclature. Otherwise, we are doomed to change taxonomic names time and again, including those of species of practical importance. A good example of it may be found among planorbid snails. In 1960, a new species of limpet snails was described from Italy under the name *Watsonula wautieri* Mirolli, 1960. Later on, it was transferred to the genus *Ferrissia* Walker, 1903 and known in the European literuture as *F. wautieri* [Fakner *et al*., 2001; Glöer, 2002]. In the 1970-1990s, it was proposed to label this species, successively, as *Pettancylus petterdi* (Johnston, 1879) [Kafanov, Starobogatov, 1971], *P. australicus* (Tate, 1880) [Stadnichenko, 1990], *Ferrissia isseli* (Bourguignat, 1866) [Kinzelbach, 1984], or *F. clessiniana* (Jickeli, 1882) [Hubendick, 1970; Falkner, von Proschwitz, 1995]. In the 2000s, Walther *et al*. [2006] demonstrated that this species of presumably Old World origin is identical with the American *Ferrissia fragilis* (Tryon, 1863) and thus is an invasive species in Europe and Asia. This opinion has been accepted by almost all recent researchers [Marrone *et al*. 2011; Welter-Schultes, 2012; Albrecht *et al*. 2014; Vinarski, Kantor, 2016]. However, in 2016, it was proposed to change its name again. Christensen [2016] suggested that the name *Ferrissia californica* (Rowell, 1863) must have priority before *F. fragilis*.

Hence, we have seven different names for a single snail species applied during last 50 years. Among these species name changes, only one seems to be essentially important for taxonomy and biogeography, that giving the evidence of the Nearctic origin of the European populations of this taxon [Walther *et al*., 2006].

The acting nomenclatorial code [ICZN, 1999] is not perfect and has to be improved in some aspects [Dubois, 2011]. I think that the next edition of the Code should provide an operational definition for the term 'nomen dubium' and prohibit the use of PrP in application to the taxonomic names whose exact taxonomic meanings are hopelessly unrecognizable. However, in all cases when the conclusive evidence dictates to adhere to the priority principle it should be obeyed.

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Недавние изменения видовых названий европейских Lymnaeidae: две истории с несчастливым концом?

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РЕЗЮМЕ. Обсуждаются два сомнительных прецедента замены номенклатурных названий в семействе Lymnaeidae Rafinesque, 1815 (прудовиковые), предложенные в 1990–2000-х гг: *Radix labiata* (Rossmäßler, 1835) vs. *R. peregra* (O.F. Müller, 1774) и *Stagnicola fuscu*s (C. Pfeiffer, 1821) vs. *S. vulneratus* (Küster, 1862). Показано, что в обоих случаях предложенные замены видовых названий не были основаны на вполне убедительных доказательствах и, как таковые, лишены существенных оснований. Так, название *Radix peregra* не должно быть отвергнуто в пользу *R. labiata*. Как показало изучение типовой серии последнего таксона, обнаруженной в коллекции Венского естественноисторического музея, *R. labiata* – это младший синоним *R. balthica* (Linnaeus, 1758). Обозначается лектотип *Limnaeus pereger* var. *labiatus* Rossmäßler, 1835. Восстановление видового биномена *Limnaeus fuscus* (Pfeiffer, 1821) применительно к одному из видов рода *Stagnicola* также вызывает сомнения, поскольку это название должно рассматриваться как сомнительное (*nomen dubium*). Любая таксономическая интерпретация такого названия неизбежно будет основана на более или менее достоверных гипотезах, но не на окончательном доказательстве. Замещение названия *S. vulneratus* его предполагаемым старшим синоним вносит мало нового в наше знание систематики и эволюционных взаимосвязей в семействе Lymnaeidae. Желательно, чтобы номенклатурный принцип приоритета не применялся относительно к сомнительным названиям (*nomina dubia*).