



Ichthyosaura as a generic nomen for the Alpine Newt (Caudata: Salamandridae): a doubtful case of literarian archeology

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Abstract. Since the partition of the traditional genus *Triturus* RAFINESQUE, 1820 by GARCIA PARIS et al. (2004), the Alpine Newt, formerly *Triturus alpestris* (LAURENTI, 1768), was first assigned to *Mesotriton* BOLKAY, 1927. This allocation was challenged by SCHMIDTLER (2004, 2009) who had unearthed and revived the older but almost never used name *Ichthyosaura* SONNINI & LATREILLE, 1802, a potential nomen oblitum which was based on the flawed drawing of a larva figured by LAURENTI (1768) as *Proteus tritonius*, bearing the type locality “in alpe Etscher”. Because of this locality, the otherwise unidentifiably drawn larva was interpreted as belonging to the Alpine Newt and was considered as the “iconotype” of *Ichthyosaura alpestris* n. comb. sensu SCHMIDTLER (2009). This proposal has been controversially discussed, and eventually the supporters of this nomenclatural innovation gained the upper hand. We show that the argumentation of the advocates of replacing *Mesotriton* by *Ichthyosaura* overlooked some important aspects in LAURENTI’s work concerning the type localities of both the nomina *Proteus tritonius* and *Triton alpestris*. Also, details of the illustrated larva and LAURENTI’s description of its collecting site and circumstances do not support the view that this “iconotype” could unambiguously be referred to the Alpine Newt. Moreover, LAURENTI himself expressly denied the identity of these two nomina. Therefore, according to Article 12.2.5. ICZN, *Ichthyosaura* must be regarded as a nomen dubium. To resolve this uncertainty, we designate a toptypic larva of *Salamandra salamandra* (LINNAEUS, 1758) as the neotype for *Proteus tritonius* LAURENTI, 1768, rendering LAURENTI’s name synonymous with the Fire Salamander. Consequently, the Alpine Newt must be named again *Mesotriton alpestris* (BOLKAY, 1927).

Key words. Lissamphibia, European Alpine Newt, generic nomenclature, nomen oblitum, nomen dubium, stability versus priority, neotype, *Mesotriton*, *Ichthyosaura*, *Salamandra*.

Introduction

In many zoological disciplines, taxonomy is regarded unpopular. On the one hand, it is regarded as old-fashioned because in its present form and concept it dates back to LINNAEUS (1758) who, in the 10th edition of his “Systema Naturae” laid the basis of our still valid classificatory and nomenclatural system. On the other hand, many users who rely on taxonomic identifications of their study objects from other biological disciplines, e.g. ecologists, are sometimes frustrated about the frequent reclassifications and renamings regarded as necessary by taxonomists. In order to regulate the nomenclature of species in an international, binding way, the “International Code of Zoological Nomenclature” (ICZN, termed “the Code” in the following text) was created by the International Commission of Zoological Nomenclature (1999). Because, however, taxonomy and nomenclature of organisms are also based on a system aimed to reflect new phylogenetic discoveries of

current research, nomenclatural adaptations and changes in respect to these new findings are unavoidable. The Code had therefore to present rules to support stability and constancy of names, and this main goal is anchored in its preamble. One means to achieve this end was the principle of priority (Art. 23. ICZN) meaning that the oldest name given to a taxon should be the valid one. However, when old names from forgotten or overlooked sources are recovered and threaten well-established younger names, the principle of priority may come into conflict with the demand for stability of the Code’s preamble. The search for such forgotten or overlooked names and their reinstatement in lieu of their younger synonyms which were, however, in common usage, has been termed “literarian archeology” and “names from the moth box” by the famous systematist ERNST MAYR (1969, 1975). Citing MICHENER (1963), he added: “In other sciences the work of incompetent people is simply ignored, but in taxonomy, it is preserved by the priority law”.

As is the case in numerous other animal groups, the amphibians of the European fauna have also undergone many nomenclatural changes in the past centuries. A review with the aim of consolidating the situation for the Central European species has been published by VENCES (2007, 2015). In just one of the examples listed, he added a critical paragraph “Renaming not for every price: The case of the Alpine Newt” (VENCES 2015). This aspect which had already been signaled earlier (e.g. BÖHME 2011 a, 2023, BÖHME & SCHLÜPMANN 2011), is the topic of the present paper.

Results

The case of the Alpine Newt

TITUS & LARSON (1995) provided molecular genetic evidence that the traditional genus *Triturus*, erected by RAFINESQUE (1820, not RAFINESQUE 1815, see SCHMIDTLER 2004) was not monophyletic. This was subsequently corroborated by ZAJC & ARNTZEN (1999), WEISROCK et al. (2006) and STEINFARTZ et al. (2007) (see also PYRON & WIENS 2011). A partition of *Triturus* (type species *T. cristatus*) was therefore unavoidable: Only the group allied to the Crested Newt maintained its genus name, the smaller-sized species of the *T. vulgaris* group were united under BELL’s (1839) name *Lissotriton* (GARCIA PARIS et al. 2004), and those of the *T. vittatus* group under GRAY’s (1850) name *Ommatotriton* (LITVINCHUK et al. 2005). The distinct clade of the Alpine Newt (Fig. 1) was, again according to GARCIA PARIS et al. (2004), allocated to the generic name *Mesotriton* BOLKAY, 1927 (not 1928: contra SCHMIDTLER 2004, 2009; see also DUBOIS & RAFFAËLLI 2009).

This nomenclatural change was generally accepted, until SCHMIDTLER (2004, 2007, 2009) unearthed, hidden in the historical literature, the name *Ichthyosaura* which was created by SONNINI & LATREILLE (1802; [not 1801 as cited by SCHMIDTLER 2007, 2009 and by DUBOIS & RAFFAËLLI 2009]; see also SCHMIDTLER 2004 and ARRIBAS & RIVERA 2009) to generically accommodate a urodelan larva originally described and figured by LAURENTI (1768) as *Proteus tritonius*, who considered it as a close relative of his famous neoteneous Cave Olm, *Proteus anguinus*. Because LAURENTI’s (1768) name was accompanied by a type locality situated in the Lower Austrian Alps (“in alpe Etscher”), the belonging drawing was interpreted as that of an Alpine Newt larva (see SCHMIDTLER 2004, 2007, 2009, GOLLMANN & GOLLMANN 2010). If this interpretation were justified, *Ichthyosaura* SONNINI & LATREILLE, 1802 would have priority over *Mesotriton* BOLKAY, 1927 and would require the application of Art. 23. ICZN meaning replacement of the latter by the former name (SCHMIDTLER, 2009) which had not been in use for more than two centuries, its exhumation representing therefore a case of “literarian archeology” sensu MAYR (1969, 1975).

The revalidation of *Ichthyosaura* lead to controversial discussions and could possibly have been avoided (VENCES 2015) if many authors would not have quickly and uncritically accepted this old and poorly justified name (e.g. SPEYBROECK & CROCHET 2007, BOUR et al. 2008, LESURE 2008, DUBOIS & RAFFAËLLI 2009, SPEYBROECK et al. 2010, GLANDT 2010, THIESMEIER & SCHULTE 2010 and others). While in France and in the German-speaking literature (apart from some exceptions: Arbeitskreis Amphibien und Reptilien in Nordrhein-Westfalen 2011, SCHLÜPMANN et al.



Figure 1. Adult male (from Wuppertal, W Germany) of the Central and South European Alpine Newt representing an own, distinct clade of generic rank within the Salamandridae, its nomenclaturally correct allocation being still disputed. Photo by BENNY TRAPP.

2011, BÖHME 2014, BODINGBAUER & SCHLÜPMANN 2020), this renaming of the Alpine Newt was largely accepted, the Spanish literature took a much more critical view and even rejection of this name (CARRETERO et al. 2011, 2014) so that *Mesotriton* remained in use until recently (e.g. ÁLVAREZ 2010, MATEO et al. 2011, HERRERO & ZIMIC 2015, FIBLA et al. 2015, BOSCH et al. 2015, SANTOS et al. 2015, AYLLÓN et al. 2015, PLEGUEZUELOS et al. 2015, GOSÁ 2016, DIEGO-RASILLA 2017). But there was also one early acceptance of the validity of *Ichthyosaura* in Spain (ARRIBAS & RIVERA 2009). Despite the disturbing similarity of this name in relation to the famous fossil ichthyosaurian reptiles (including the fossil reptilian genus *Ichthyosaurus* DE LA BÈCHE & CONYBEARE, 1821; see e.g. GOLLMANN & GOLLMAN 2010, VENCES 2015), nobody seems to have yet checked SCHMIDTLER's (2004, 2007, 2009) arguments in respect to the original Latin text by LAURENTI (1768) in detail.

Former arguments in favour of *Ichthyosaura*

The new genus name for the Alpine Newt, several times proposed by SCHMIDTLER (2004, 2007, 2009), goes back to SONNINI & LATREILLE (1802; Fig. 2) and is based on the figure (“iconotype”) of a urodelan larva which was originally published 34 years before by LAURENTI (1768) who had described it as *Proteus tritonius*. The description by SONNI-

NI & LATREILLE was practically identical with that of LAURENTI, except the erection of their new name *Ichthyosaura* wherefore it is of secondary importance for the question of the latter's applicability for the Alpine Newt. It is just the name itself which is formally available and because of the “one letter difference” rule (Art. 56.2. ICZN) not preoccupied (see SCHMIDTLER 2004, 2009) and even older than the “two letter difference” name of the fossil aquatic reptile *Ichthyosaurus* DE LA BÈCHE & CONYBEARE, 1821. LAURENTI's (1768) genus name *Proteus*, however, is preoccupied and unavailable for a salamandrid, because its type species is the Cave Olm (*P. anguinus*), representing a different urodelan family (Proteidae).

More important for the difficult question of the correct genus name of the Alpine Newt is therefore LAURENTI's (1768) work itself (Fig. 3). First, the possible identity of the now famous “iconotypic” drawing of his *Proteus tritonius* has to be reconsidered. It doubtlessly represents a urodelan larva, but it seems impossible to refer it to a particular Central European species (see Fig. 4). The long dorsal fin edge anteriorly reaching the level of the forelimbs or even the head, argues more for a newt larva and occurs similarly in Smooth Newt (*Lissotriton vulgaris*, Fig. 5 a) and Alpine Newt larvae (Fig. 5 b). The relatively long forelegs point additionally to an Alpine Crested Newt (*Triturus carnifex*) larva, because larvae of this species group have very long forelegs and toes (Fig. 5 c) which function during floating

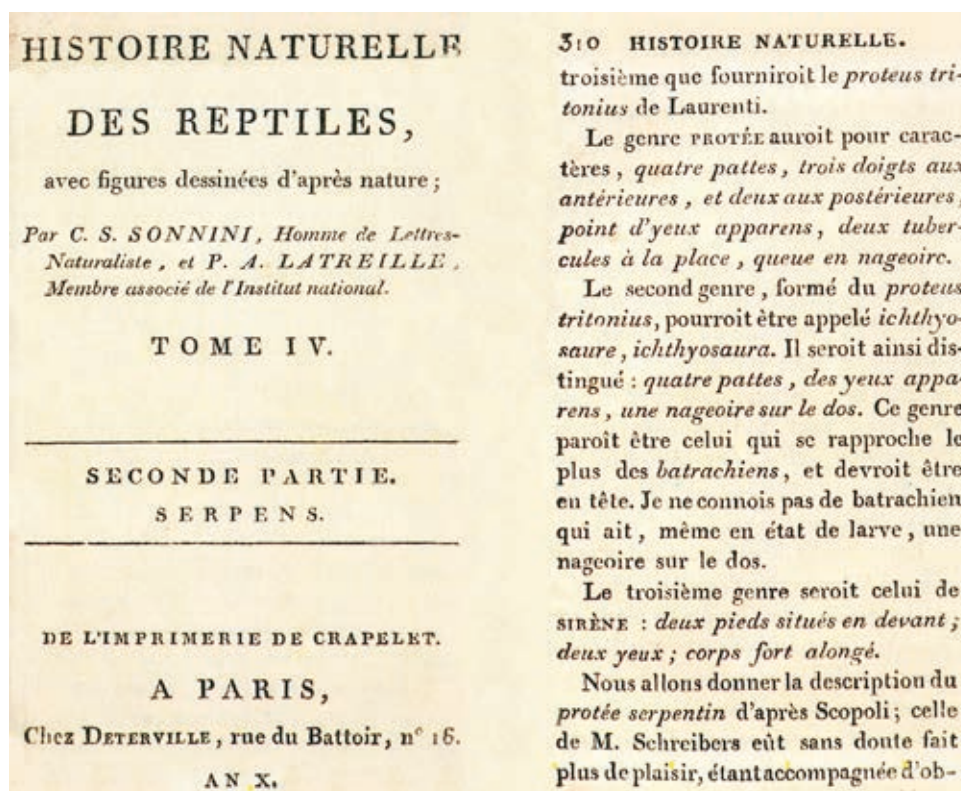


Figure 2. Title page of SONNINI & LATREILLE (1802) (AN X = Année 10 (year 10) à 1792 + 10 à 1802), and page 310 from the “additions” to Volume IV of SONNINI & LATREILLE (1802) where the name *Ichthyosaura* (in French *ichthyosaure*) is first mentioned.

as antennae on both sides of the head, triggering an immediate snapping reflex, should there be a tactile contact with a small prey item. The terminally expressly rounded tail, however, would fit a Fire Salamander (*Salamandra salamandra*) larva (Fig. 5 d) better. One must, however, admit that these differences are too vague to serve as reliable diagnostic characters of one of the four salamandrid species occurring in that area listed above. Also SCHMIDTLER (2009) stated clearly (our translation): “In fact the figure given by LAURENTI (1768: Tab. II; Fig. 2) does not allow an exclusive assignment to any of the three mentioned species” (three, because *Triturus carnifex* was not included in his comparisons). In his first paper on this topic, SCHMIDTLER (2004) himself regarded the names *Proteus tritonius* and *Ichthyosaura tritonius* (in this combination it should be *tritonina* [Art. 31.2. and 34.2. ICZN]) as questionable synonyms of *Lissotriton vulgaris*, but hinting at the locality of *P. tritonius*, he already favoured the identity with an Alpine Newt larva. Earlier works assigned LAURENTI’s figure either to *Salamandra salamandra* (LEYDIG 1867, EISELT 1958), to the Alpine Newt (BECHSTEIN 1800, DAUDIN 1803, MERREM 1820), or to *Lissotriton vulgaris* (SCHNEIDER 1799, LATREILLE 1800, STURM 1828, REIDER & HAHN 1832, see also the list in SCHMIDTLER 2004). So there is a general consensus that the figured “iconotypic” larva, based on its morphological characters, cannot be assigned to a particular urodelan species (see SCHMIDTLER 2004, 2009). It may be noted here that EISELT (1958) based his synonymization on a misinterpretation of LAURENTI’S (1768) type locality

“Etscher” which he understood as the North Italian (South Tyrolian) river Adige whose German name is Etsch and therefore gave “Meran” (= Merano), situated close to this river, as the presumed type locality.

To resolve the question of the identity of LAURENTI’S (1768) drawing, there are, however, still the ecological data given in his accompanying description, which are, “compared with the otherwise predominating low quality of such descriptions of those times, especially those by LINNAEUS (1758), exceptionally extensive and insightful” (SCHMIDTLER 2009; our translation). According to LAURENTI (1768) the larva was found “in lacu frigidissimo, qui est in alpe Etscher” (= in a very cold pond [lake] at Mount Ötscher, see SCHMIDTLER 2009). The only other urodelan species occurring there is the Alpine Salamander (*Salamandra atra*), addressed by LAURENTI (1768) with the same type locality. This species, however, as is generally known, does not have a free, aquatic larval stage. Consequently, only the Alpine Newt could have been the model for LAURENTI’S “iconotype”.

This pond seems to be still in existence today and is found at ca. 1300 m above sea level. And in view of the continuing discussions on the valid genus name of the Alpine Newt, its amphibian fauna was re-investigated with the result of the finding of several thousands of *Bufo bufo* tadpoles, several hundred Alpine Newt larvae, and more than ten adults of the latter species (GOLLMANN & GOLLMANN 2010). Based on this evidence, the problem seemed to be resolved: In a clearly defined water body the Al-



Figure 3. Title page of LAURENTI (1768), and plate II from this work showing, next to an adder (I: named *Coluber berus* = *Vipera berus*), a urodelan larva (II: named *Proteus tritonius*), a juvenile Alpine Crested Newt (III: named *Triton carnifex* = *Triturus carnifex*), an Alpine Newt (IV: named *Triton alpestris* = *Ichthyosaura/Mesotriton alpestris*), and a hardly recognizable lizard (V: named *Seps sericeus* = *Lacerta viridis*).

pine Newt proved to be the only urodelan species recently found so that the larva described from this place, viz. *Proteus tritonius* LAURENTI, 1768, would necessarily have to be referred to the Alpine Newt which is also true for the genus name *Ichthyosaura* SONNINI & LATREILLE, 1802 subsequently attached to it. This “forgotten name” (= nomen oblitum) concurred with *Mesotriton* BOLKAY, 1927 (see also BOLKAY 1928) which at that time was still in an early stage of common usage. Because of the high priority of *Ichthyosaura* over *Mesotriton*, SCHMIDTLER (2009) declared the former to be the valid genus name for the Alpine Newt. SCHMIDTLER’S (2004, 2009) argumentation was, uncritically, followed by several subsequent authors (e.g. SPEYBROCK & CROCHET 2007, BOUR et al. 2008, LES-CURE 2008, DUBOIS & RAFFAËLLI 2009, SPEYBROCK et al. 2010, GLANDT 2010, THIESMEIER & SCHULTE 2010) so that the exhumated name became established and will hardly be suppressible again (VENCES 2015).

Arguments against

A closer look on the whole situation makes things, however, less clear than believed according to the sources cited above. First of all, it must be discussed if it is justified to extrapolate the current occurrence of amphibians at a particular site with a situation around 1760, i.e. some years prior to LAURENTI’S (1768) work. More than two and a half centuries are truly a long time span in terms of climatic and ecological alterations. In view of global warming nobody would be astonished if, in a few decades, the larvae of *Triturus carnifex*, *Lissotriton vulgaris* or *Salamandra salamandra* would eventually show up in this pond at Mt. Ötscher at 1320 m a.s.l. There was also considerable climate change in Central Europe in the past centuries which had great effects on the distribution of amphibians and reptiles illustrated by some examples by BÖHME (2011 b), e.g. the occurrence of the Aesculapian snake (*Zamenis longissimus*) and the Smooth Snake (*Coronella austriaca*) in Denmark.



Figure 4. Detail of Figure 3 showing the “iconotype” of *Proteus tritonius* magnified. Its character combination (skin hem reaching relatively far anteriorly, overlong forelimbs, rounded tail tip) makes an unambiguous taxonomic allocation impossible.

The main reason for marginal extinction was the so-called Little Ice Age which influenced, with some marked temperature oscillations, the centuries between 1440 and 1920 (OWENS et al. 2017). So, if in LAURENTI’S lifetime the climatic conditions were more favourable than during the subsequent cooling, it might also well be possible that more thermophilic urodelans like *T. carnifex*, *L. vulgaris* or *S. salamandra* were able to exist in ponds in the Ötscher region or in other places of the Alpine realm at this time, before they disappeared again. It seems thus problematic to infer the species spectrum in this particular pond around 1760 from the current distribution of newts at this same

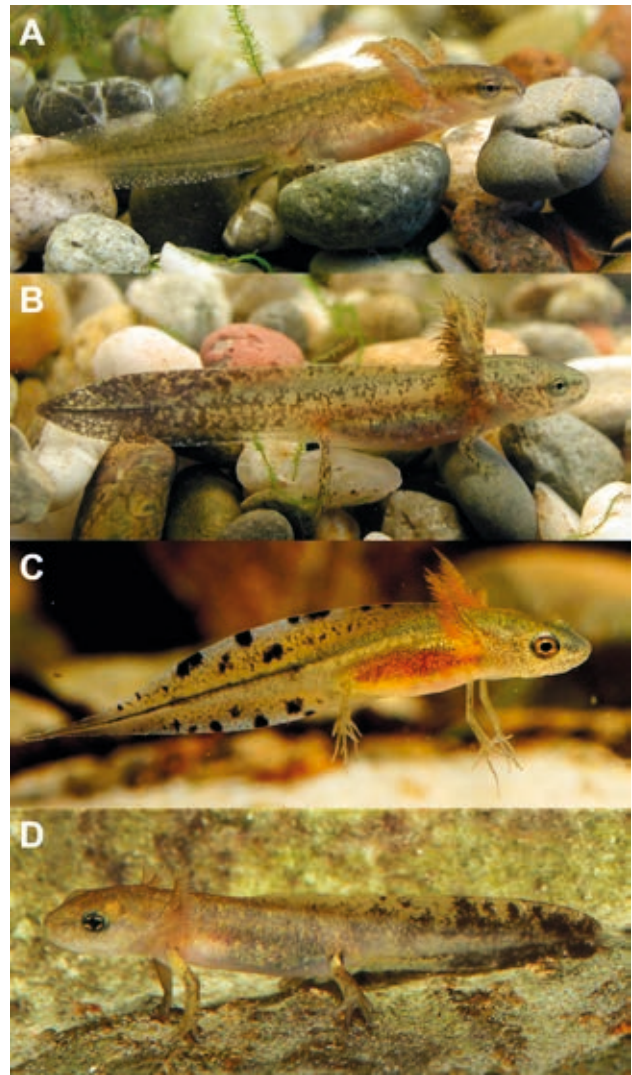


Figure 5. Larvae of urodelan species occurring in the Ötscher Alps: (A) *Lissotriton vulgaris*, the dorsal skin hem would fit LAURENTI’S figure. (B) Alpine Newt larva, its habitus being similar to that of the *L. vulgaris* above. (C) Larva of *Triturus ivanbureschi*, which looks nearly identical to a *T. carnifex* larva, showing the likewise elongate forelegs. (D) *Salamandra salamandra* larva from near the type locality (ZFMK 104204). Photos A, B, D: THOMAS MUTZ, C: MICHAEL FAHRBACH.

locality. Although this argument does not immediately disqualify *Ichthyosaura* as the genus name for the Alpine Newt, it demonstrates nonetheless that the situation might be more complicated than believed before.

There are, however, more inconsistencies which are more serious and must be discussed in some linguistic detail. According to SCHMIDTLER (2004, 2009) a water body such as a cold mountain pond at Mt. Ötscher is regarded as the site where *Proteus tritonius* has been found. This statement is refined by DUBOIS & RAFFAELLI (2009) and by GOLLMANN & GOLLMANN (2010) and restricted to a small pond at the northeastern slope of the summit of Mt. Ötscher, based on the “ecological data” given by LAURENTI (1768) who wrote on p. 37 in his diagnosis for *Proteus tritonius*: “Habitat in lacu [= lives in a lake], qui est in alpe Etscher“. On page 140 he repeated: “Habitatio. In lacu frigidissimo (= Habitat. In a very cold lake [pond], qui est in alpe Etscher“. On p. 38, speaking about his *Triton alpestris*, he characterized its locality with: “Habitat in Etschero monte“, while on page 42, dealing with *Salamandra atra*, he stated: “Habitat in alpe Etscher Austriae & Loibel inter Carinthiam and Carnioliam“. On page 143, again on *Triton alpestris*, he repeated: “Habitatio. In Etschero monte“, and on page 149, again on *Salamandra atra*: “Habitatio. In alpe Etscher“ is likewise repeated. So, on several occasions and on different pages in his book, LAURENTI distinguished clearly and constantly between “in alpe” and “in monte” in connection with the term Etscher. And while it is clear that “in monte” means a specific mountain, “in alpe” is obviously used differently, and in spite of the singular case, this wording in the ablative case means also a mountain range, and not a single mountain (GEORGES 1913). This becomes even clearer in the sentence cited above about *S. atra* on page 42, because here two mountain sites, Mt. Ötscher in Austria and the Loibl Pass between Carinthia and Krain (today Slovenia) are both referred to “in alpe”. Therefore, the latter formulation should not be translated with “on Mt. Ötscher” but with “in the Ötscher mountain range”, or the Ötscher Alps which are currently characterized as a geographical triangle between Neubruck south of Scheibbs in the North, Lunz am See in the Southwest, and Mariazell in the Southeast. The air-distance between Neubruck and Lunz is ca. 17 km, that between Neubruck and Mariazell 25 km, and between Lunz and Mariazell 23 km (TRIMMEL 1962, STUMMER & PLAN 2002, PLAN 2021) (Fig. 6). This means that the restriction of the type locality of *Proteus tritonius* to a specific cold mountain pond on the northeastern flank of Mt. Ötscher at 1300 m a.s.l. is not any more supported. Rather, numerous other ponds, also in somewhat lower altitudes (down to 800 m a.s.l.), could be taken into account where also larvae of the other salamandrid species can occur. According to the grid maps in CABELA et al. (1997, 2001), in addition to the Alpine Newt also *L. vulgaris*, *T. carnifex* and *S. salamandra* are present in this area. The latter is even able to reach elevations up to 1550 m in Lower Austria, and *T. carnifex* has been recorded from 1480 m a.s.l. nearby, and *L. vulgaris* also occurs, though in low densities, above 1300 m in Austria and can reach more than 2000 m a.s.l. (CABELA et al. 2001, GOLLMANN & GOLLMANN 2010).

Also the “ecological data” provided by LAURENTI (1768, p. 141) on the habitat of his *Proteus tritonius* such as “Asylum in glutine fundi paludum” (= Retreat in the mud on the ground of a swamp) point more to a vegetated water body in lower altitude than to the mountain pond on the northeastern flank of Mt. Ötscher at 1320 m a.s.l. as described by GOLLMANN & GOLLMANN (2010), more so as their photograph suggests relatively clear water with comparatively little submersed vegetation. Also LAURENTI’s following remarks on the time of his find are relevant and very interesting: “Anni tempus, quo repertus, nempe extremo autumno, quo nix iam cadebat” (= The season during which it [*P. tritonius*] was found, was the end of the autumn when snowfall already began). These remarks explain LAURENTI’s emphasis on the cold temperature of the water and also of the seasonal presence of *P. tritonius*: “Relatio alpicolarum, qui dicunt toto anno reperiri immutatum” (According to the local Alpine inhabitants it [*P. tritonius*] can be found unchanged all over the year“). The pond on the northeastern flank of Mt. Ötscher described by GOLLMANN & GOLLMANN (2010) is even today a rather remote and isolated place so that a visit even in our days is quite arduous (e.g. GOLLMANN & GOLLMANN 2010). How much more difficult must that have been in LAURENTI’s time, especially in snowy and herpetologically inconvenient weather conditions? This information together with LAURENTI’s comments cited above as well as the hints from the local population on an aquatic occurrence of these animals throughout the year make it more likely that another pond at a lower elevation and closer to human settlements in the Ötscher region was concerned. We conclude that the possible locality where *Proteus tritonius* was found is still open for various interpretations, and that it is not possible to unambiguously identify the locality and the possible accompanying spectrum of amphibian species more than two and a half centuries ago.

What did LAURENTI tell us himself on his find?

LAURENTI (1768) referred twice to his discovery. His first comment (on p. 37) is: “Paradoxum, ut bic sit gyrinus tritonis alpestris” (= It would be paradoxical if it would be the larva of *Triton alpestris*). And further (on p. 141): “An gyrinus tritonis alpestris? negant I. anni tempus, quo repertus nempe extremo autumno, quo nix jam cadebat. II. relatio alpicolarum, qui dicunt toto anno reperiri immutatum. III. in aqua branchiis utitur, extra aquam eodem tempore pulmonibus pro arbitrio, quod alias gyrini non folent. Si quis melioribus argumentis contrarius ostenderit, acquiesco.” (= A larva of *Triton alpestris*? The answer is negative. I. The season when it [*P. tritonius*] was found, was the end of the autumn when the first snowfall happened. II. According to the local alpine inhabitants, it [*P. tritonius*] can be met with in the same form all over the year. III. The use of gills in the water and of lungs at the same time on land at its own discretion, which other amphibian larvae do not do. If somebody can demonstrate the opposite by better arguments, I would be content).

LAURENTI (1768) thus asked twice whether his *Proteus tritonius* could be the larva of the Alpine Newt and answered twice in the negative, the second time with some convincing arguments (see above). Rather, by assigning it to the genus *Proteus*, he considered this animal to be a relative of the Cave Olm (*P. anguinus*) which he described in the same work. This means that LAURENTI himself explicitly denied the possibility that his *P. tritonius* could be the larva of the Alpine Newt. But although this opinion could hardly have been expressed more clearly, and although his work is generally praised, e.g. by SCHMIDTLER (2004: “One could call this early herpetological work [global systematics, eastern alpine regional faunistics and experimental biology in one] nearly the ‘Old Testament of Herpetology’ “), it does not play a significant role in the discussion about the valid generic name of the Alpine Newt. SCHMIDTLER (2004) just commented succinctly: “According to my opinion, LAURENTI’s figure, in connection with the locality of the larvae and the ecological data, allows only a synonymization of *Proteus tritonius* with *Triturus alpestris*, although LAURENTI (1768: 141) has questioned this himself” (our

translation), and added five years later (SCHMIDTLER 2009) which could be misunderstood: “A larva of *Triturus alpestris* as it was considered already by LAURENTI (1768, p. 141) himself” (again our translation). This reveals a discrepancy between the praise for LAURENTI’s pioneering work on the one hand, and the valuation of his ecological data on the other.

Discussion

What is now the essence of this story for the two generic names in question: *Ichthyosaura* SONNINI & LATREILLE, 1802 or *Mesotriton* BOLKAY, 1927? Should the name given by BOLKAY be reinstated? Or should VENCES (2015) be proven correct that it might be too late to suppress *Ichthyosaura* again? There is an “iconotype” for *Proteus tritonius* or *Ichthyosaura tritonina* respectively which figures doubtlessly a urodelan larva, but an unambiguous specific allocation is not possible, as it is also admitted by the advocates of the latter name (e.g. SCHMIDTLER 2004, 2009).



Figure 6. Map showing the region around Mt. Ötztal, Lower Austria, currently referred to as Ötztal or Ötztal Alps, shown here as a red triangle (cf. TRIMMEL 1962, STUMMER & PLAN 2002, PLAN 2021). Presumably this area coincides roughly with that what LAURENTI (1768) termed as “in alpe Etscher”.

In contrast to the works of the last-named author and to GOLLMANN & GOLLMANN (2010), an indirect taxonomic allocation of the larva based on its alleged locality is likewise impossible because, as demonstrated above, LAURENTI's (1768) ecological data do not refer to a particular, still existent cold mountain pond on or at Mt. Ötscher, i.e. the so-called Great Ötscher (contra SCHMIDTLER 2004, 2009, KUZMIN 2005, GOLLMANN & GOLLMANN 2010), but to another lake or pond somewhere in the Ötscher region which also admits many possible water bodies at lower elevations. Therefore, the former and/or current occurrence of the other three urodelan species with aquatic larval stages which live in the area, cannot be excluded. It is also possible, that a paedomorphic larva may have been concerned.

Only mentioned in passing here is also the generic name *Hemitriton* erected by DUGÈS (1852) and typified with *Triton alpestris* by FATIO (1872), therefore becoming synonymous with *Ichthyosaura* and *Mesotriton* (DUBOIS & RAFFAELLI 2009). However, it is antedated by VAN DER HOEVEN's (1833) generic name *Hemitriton*, which was typified with *Proteus anguinus* LAURENTI, 1768, making it an objective junior synonym of the latter (see DUBOIS & RAFFAELLI 2009).

In any case, the specific identification of the “iconotypic” larva remains doubtful. Consequently, also the generic nomen *Ichthyosaura* erected by SONNINI & LATREILLE (1802), is not only a forgotten (nomen oblitum) but also a dubious name (nomen dubium) and as such failing to meet the provisions of Art 12. ICZN: “To be available, eve-

ry name published before 1931, must be accompanied ... by an indication”. Art 12.2.5. clarifies the meaning of this indication: “in the case of a new genus group name, the use of one or more available specific names makes in combination with it, ... provided that the specific name can be unambiguously assigned to a nominal species-group taxon”. As has been demonstrated above, this indication is not fulfilled, and *Ichthyosaura* is therefore an unavailable name.

In order to finally eliminate all the doubts, we are designating a neotype for the name *Proteus tritonius* LAURENTI, 1768 (= *Ichthyosaura tritonina* [SONNINI & LATREILLE, 1802]), because the original specimen after which LAURENTI's (1768) drawing has been made, is definitely lost. We base our designation on a larva of the Fire Salamander, *Salamandra salamandra* (LINNAEUS, 1768) from the Mt. Ötscher region, thus rendering *Ichthyosaura* SONNINI & LATREILLE, 1802 synonymous with the much older name *Salamandra* LAURENTI, 1768 (Art. 75 ICZN).

Designation of the neotype and concluding remarks

Neotype: ZFMK 104202, young larva, parking place (“Nestelbergsäge”) near Nestelberg, SE of Gaming, Ötscher Alps, Lower Austria (47.880833 N, 15.207836 E, 800 m a.s.l.), 2.2 km air-distance north from Mt. Ötscher's summit, collected by THOMAS MUTZ and UWE KOEPELNICK, on 18 June 2024 (Fig. 7 and Fig. 8, above).



Figure 7. The neotype of *Proteus tritonius* LAURENTI, 1768 (ZFMK 104202), a larva of *S. salamandra* from LAURENTI's (1768) type locality “in alpe Etscher” preserved and in life. (Photos by MORRIS FLECKS and THOMAS MUTZ, respectively).

The larva has a total length of 29.1 mm, with the forelegs still slightly longer than the hindlegs and is obviously newborn since newborn larvae of *S. salamandra* in Central Europe have an average length of 29.6 ± 2.4 mm (24–35 mm, $n = 746$; THIESMEIER-HORNBERG 1988). It has been collected in a small creek (Fig. 9) close to the so-called “Nestelbergsäge” parking place in a forested environment (Fig. 10). The water temperature was only 8.5 °C with an air temperature of 28 °C.

Two more larvae (ZFMK 104203–204, Figs 5 d and Fig. 8, center and below) were collected on 19 June 2024 some 7.5 km to the northwest of Mt. Ötscher’s summit (direction of Gaming, 47.922507 N, 15.155239 E) at ca. 400 m a.s.l., immediately south of the river Erlauf. Here, the water temperature was 14.5 °C with an air temperature of 27 °C. At this elevation, the larvae are obviously a bit older than the larva from the 400 m higher locality. These data fit the information given by LAURENTI (1768) that his *Proteus tritonius* larva had been found during snowfall. Given a time span for completing metamorphosis in *S. salamandra* of on average 120 days (four months: in a creek in northwest Germany at 100–200 m a.s.l. with an average temperature of 10 °C: see THIESMEIER & HORNBERG 1988, THIESMEIER 1992), it is well possible that a larva born in mid-June at 800 m a.s.l., may well still experience first snowfalls at that height. So, a lower locality than the lake on Mt. Ötscher at 1300 m a.s.l. is not contradictory to LAURENTI’s (1768) text. Rather, his mentioning of the local people who were familiar with these little creatures, argues again for a locality at a lower and better accessible elevation.

An important aspect and the starting point of our argumentation chain was that LAURENTI (1768) had definitely distinguished between the localities “in Etschero monte” for his *Triton alpestris*, and “in alpe Etscher” and “in alpe

Etscher Austriae et Loibel inter Carinthiam et Carnioliam” for his *Proteus tritonius* and *Salamandra atra* respectively. This extended the possible area of origin of his *P. tritonius* considerably and brought also the additional newt species (*Lissotriton vulgaris*, *Triturus carnifex*) occurring in the Ötscher Alps and the Fire Salamander into the discussion. Because LAURENTI’s “iconotype” does not allow a specific allocation, we fix the nomenclatural situation by designating a *Salamandra salamandra* larva from near the type locality as neotype thus rendering the generic nomen *Ichthyosaura* SONNINI & LATREILLE, 1802 synonymous with the latter. *Ichthyosaura* is therefore no more a forgotten (nomen oblitum) or dubious name (nomen dubium) with uncertain specific identity and as such failing the prerequisites of Art. 12. ICZN, but a younger synonym of *Salamandra* LAURENTI, 1768.

The only generic name now unambiguously referable to the Alpine Newt is therefore *Mesotriton* BOLKAY, 1927 so that the valid denomination of this salamandrid should be again *Mesotriton alpestris* (BOLKAY, 1927).



Figure 8. The three *S. salamandra* larvae from the surroundings of Mt. Ötscher collected in mid-June 2024: above the neotype (ZFMK 104202) from 800 m a.s.l., the middle and lower ones (ZFMK 104203–204) from ca. 400 m a.s.l. Photo by THOMAS MUTZ.



Figure 9. The creek near Nestelberg (Gaming, Lower Austria) where the neotype has been collected, i.e. now the type locality of *Proteus tritonius*. Photo by THOMAS MUTZ.

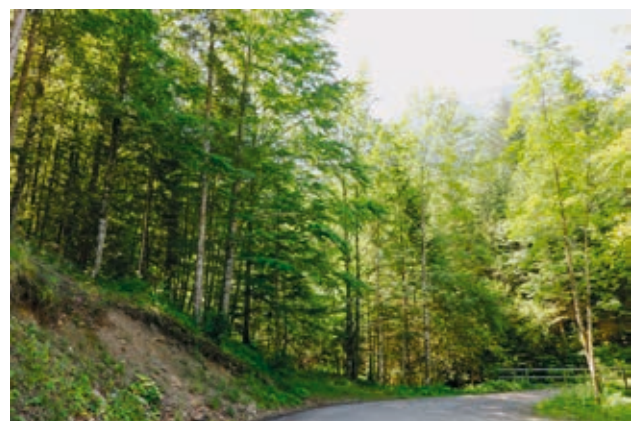


Figure 10. Surroundings of the water body where the neotypic larva was collected. In the background, Mt. Ötscher can be vaguely recognised between the trees. Photo by THOMAS MUTZ.

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