Correct voucher specimen data reduce 'shelf life' of undescribed species

In a recent article, FONTAINE et al. (2012) addressed the dilemma caused by the large part of still unknown global biodiversity and calculated that the average time span between the discovery of a new species in the wild and its scientific description is on average 21 years, ranging between zero and 206 years in its extremes. The authors based their analyses on a random sample of 600 species described as new in 2007 and referred to this waiting period from collection until publication as an undescribed species' 'shelf life', often spent in the collections of a natural history museum. While the conclusion of FONTAINE et al. (2012) is certainly correct, that the long 'shelf life' of many undescribed species is due to the lack of available systematists and taxonomists, there seems to be some inaccuracy involved concerning the collection date of the extreme case of more than two hundred years of 'shelf life' they refer to.

The Herpetological Collection of the Natural History Museum in Vienna (NMW) was visited in 2007 and 2013, where information about voucher specimens was received from the curators and staff and the collection catalogue. Additional information about Franz STEINDACHNER and his collections was taken from the biography by ADLER (1989) and the accounts by TIEDEMANN & GRILLITSCH (1997, 2001).

Although no explicit species names are mentioned in the article by FONTAINE et al. (2012), Benoît FONTAINE, the principal investigator, is cited in an article from the German Spiegel online magazine (WAGNER-NAGY 2012) that the extreme example represents a new venomous temple pitviper species from the Indonesian island of Sulawesi, viz. *Tropidolaemus laticinctus* KUCH, GUMPRECHT & MELAUN, 2007. According to FONTAINE (in WAGNER-NAGY 2012), the case is even more striking as the new snake species had even been depicted in a journal article long before the species was finally described in 2007. Although the reference is not specifically mentioned, it certainly refers to BOULENGER (1897), who provided an illustration of the much later designated name-bearing type. Accordingly, this article was cited by KUCH et al. (2007) in the original description of the new species.

Correctly, FONTAINE et al. (2012) extracted the collecting dates of the five type specimens of *T. laticinctus* from the original description by KUCH et al. (2007) as given by these authors. While the holotype (BMNH 96.12.9.80) of the new species lacks a collection date, this information is provided for three of the four paratype specimens. Two specimens (ZMB 34317 and ZMB 34318) from the Museum für Naturkunde in Berlin were collected in 1930, the third specimen (ZMB 47809) without any collecting data in the original description was collected between October 1930 and early 1932 (KOCH 2008), and a single specimen from the Natural History Museum in Vienna (NMW 27963:2) was allegedly donated to the collection in 1801. Thus, this latter specimen seems to have been collected at least 206 years before the new snake species was formally named and described. This is where the problem begins. Certainly, it cannot be expected that FONTAINE et al. (2012) verified all collecting dates for the 600 species of their sample. However, in the case of this extreme example a bit more diligence needed to be employed. What the authors of the new species appear to have overlooked is the fact that the donor of the specimen, Franz STEINDACHNER (1834–1919), then director of the Natural History Museum in Vienna, never visited the island of Sulawesi, the type locality of the new snake species. Though, primarily ichthyologist by passion and profession, STEINDACHNER also acquired many specimens for the herpetology unit at his own expense and donated his huge private collection of amphibians and reptiles to the museum in 1900 and 1901. Therefore, the describers of the new snake species caused some error in the data set of FONTAINE et al. (2012) by missing the date of donation by exactly 100 years.

What are the consequences of this mistake? From the graph provided by FONTAINE et al. (2012), it becomes obvious that only eleven tetrapod vertebrate species were considered in their data set, obviously

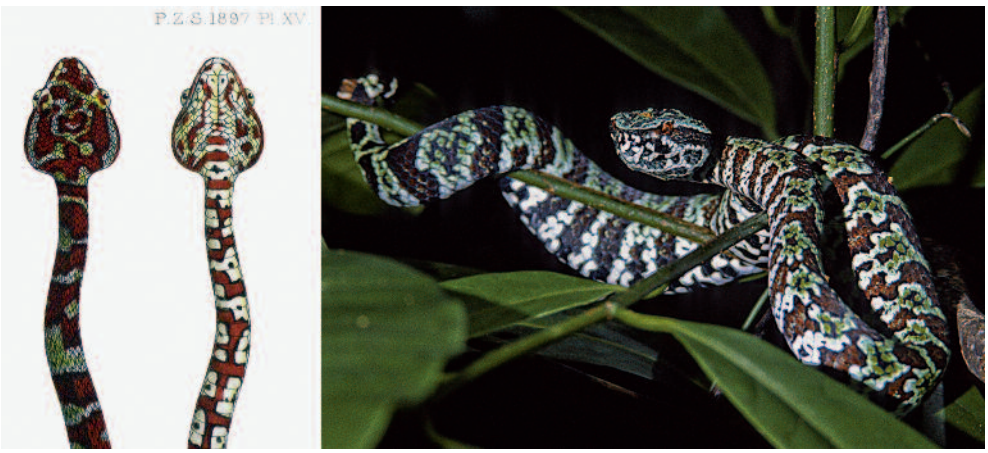

Fig. 1: The new Sulawesi temple pitviper with an alleged 'shelf life' of 206 years.
Left: First illustration of the newly described *Tropidolaemus laticinctus* KUCH, GUMPRECHT & MELAUN, 2007 from BOULENGER's (1897) "Catalogue of the reptiles and batrachians of Celebes [= today's Sulawesi] (…)" showing the holotype (BMNH 96.12.9.80), which was collected in 1893–1896, hence still more than 110 years before the conspicuous snake species was formally named and described in 2007 (KUCH et al. 2007).
Right: Live specimen from Tangkoko National Park, North Sulawesi. Photograph by Dominique Wirz.

including the new Sulawesi snake species. Remarkably, the tetrapod species show the highest standard deviation (ca. 18 years) from the mean value of 30 years of 'shelf life' for each species. Unfortunately, the authors do not provide the original data set of their analyses in the supplemental information to the article, which makes it impossible to re-calculate or reproduce the analyses and correct them, if necessary. Nevertheless, the extreme example of 206 years of 'shelf life' for the new Sulawesi snake species is not supportable. The missing raw data also impedes comparison with other species of similar long 'shelf lives' in the sample. Merely from the Spiegel online article by WAGNER-NAGY (2012) the interested reader learns that the only known specimen of *Pteropus allenorum* (HELGEN et al., 2009), a flying fox species collected on Samoa in the mid-19th century and probably already extinct today, had to wait 153 years in the collections of the Academy of Natural Sciences in Philadelphia, until it was finally described in 2009. In this confirmed case of extremely long 'shelf life', HELGEN et al. (2009) put more efforts into resolving the exact date of collection of the single type specimen.

But when was the respective specimen of the Sulawesi temple pitviper actually collected if not in 1801? A look in the catalogue of the Vienna Herpetological Collection by the author revealed that most specimens from the island of Sulawesi (formerly Celebes) originating from "Bua Praeng" or "Bua Braeng" were collected by Hans FRUHSTORFER (1866–1922), a famous German entomologist and insect dealer who travelled through Sulawesi between 1895 and 1896 (KOCH 2008). This means that this specimen was most probably collected 111 or 112 years before its scientific description as a new species in 2007. The holotype of *T. laticinctus* (BMNH 96.12.9.80; without a date), was collected by Paul SARASIN (1856–1929) and Fritz SARASIN (1859–1942), Swiss naturalists and explorers, who made extensive expeditions on Sulawesi during two long journeys in 1893–1896 and 1902–1903 (KOCH 2012). As this specimen was already depicted in 1897 (BOULENGER 1897), it was certainly collected during the first period in the early 1890s, not in 1801; thus, more than a hundred years before the description.

This example demonstrates that correct voucher specimen data and availability

of published data are two fundamental prerequisites for good practice in science! This information is not only essential for taxonomists but also for any researchers who subsequently work with newly described species, their names or their products. Taxonomic research is the basis for all other biological and medical disciplines, which is particularly important in venomous species, such as the new Sulawesi temple pitviper. However, as many new species described in recent years are already endangered in the wild, also taxonomists, the experts who discover and describe new species, are vanishing (e.g., AGNARSSON & KUNTNER 2007; WÄGELE et al. 2011; KOCH et al. 2012).

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