



Resolution of the types and type localities of some early nominal species of the Australian myobatrachid frog genus *Pseudophryne* Fitzinger, 1843

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Abstract

The types and type localities of *Bombinator australis* Gray, 1835, *Pseudophryne bibronii* Günther, 1859, and *Phryniscus albifrons* Duméril, Bibron & Duméril, 1854, are defined. The nominal type locality for *B. australis*, Swan River, is considered to be in error. The source of the specimen, Joseph Wright, owned property in the Swan River colony in Western Australia, but later resided in Sydney, the latter locality within the known range of the species. We designate a specimen in the Museum National d’Histoire Naturelle, Paris as lectotype of *Pseudophryne bibronii*, restricting the type locality of both species to Parramatta, near Sydney, based on the published statements of the collector, François Péron. The holotype of *Phryniscus albifrons*, a species defined by a painting of a specimen, was likely to have been collected by Jules Verreaux, but the only extant *Pseudophryne* obtained from Verreaux does not match the type illustration. Verreaux is renowned for the numerous errors in the localities associated with his specimens, and the locality for this specimen, Moreton Bay, Queensland, is likely to be another such error. Resolution of these issues facilitates ongoing taxonomic work on the genus using genetic and morphological data.

Key words: Myobatrachidae, *Pseudophryne*, Australia, nomenclature, type specimens

Introduction

The Australian myobatrachid frog genus *Pseudophryne* Fitzinger, 1843, currently comprises 14 morphologically similar small species, commonly known as toadlets due to their superficial resemblance to small bufonid frogs, a family that is not native to Australia. Species have simple mating calls with only limited differences, and are morphologically distinguished primarily on colouration (Fig. 1) and metatarsal tubercle size. Immunological and genetic studies (Roberts & Maxson 1989; Osborne & Norman 1991; Donnellan *et al.* 2012) have suggested that some of the currently recognised species contain cryptic diversity. However, nomenclatural recognition of these taxa is hampered by the often poorly defined type localities for the named species and loss of type specimens.

The type locality of *Pseudophryne australis*

The most well-known nomenclatural issue in *Pseudophryne* dates back to the first described species, *Bombinator australis* Gray, 1835. Gray’s brief description of the single specimen, exhibited at a meeting of the Zoological Society of London on 28 April, 1835, gives the broad type locality of “Australia”, although the description is prefaced by a statement that Gray received the exhibited specimen from a Mr Joseph Wright, from Swan River. At the time of description, in the early years of European settlement of Australia, this locality would have referred to the then-new Swan River Colony of Western Australia, founded in 1829. However, the species has a restricted distribution limited to New South Wales, and does not occur in Western Australia. The species was illustrated,



FIGURE 1. A, *Pseudophryne australis* from West Head, Kuringgai Chase National Park, Sydney, New South Wales, in life. B, *Pseudophryne bibronii* from Bridge Hill Quarry, Myall Lakes National Park, New South Wales, in life. Photos: J. Rowley.

presumably on the basis of the holotype, by Gray (1845) (the second specimen in the collection of the Natural History Museum, London (BMNH), 46.6.1.44, obtained from “Parzudaki” [presumably the natural history dealers Charles and Emile Parzudaki; Gourard *et al.*, 2016], was not acquired until the following year). The type was re-examined by Parker (1940), who confirmed that it represented the eastern Australian species rather than the only *Pseudophryne* species in the Swan River area of south-western Australia, *P. guentheri* Boulenger, 1882.

Through the courtesy of Hal Cogger, we have examined photographs of the holotype (Fig. 2), and confirm that it is conspecific with the Sydney species, and not the species from southwestern Australia. While the colour is now faded to a leaden grey hue, it is still possible to discern the pale snout and pale coccygeal stripe of this species, which are red in life (Fig. 1A), together with the poorly developed metatarsal tubercles.

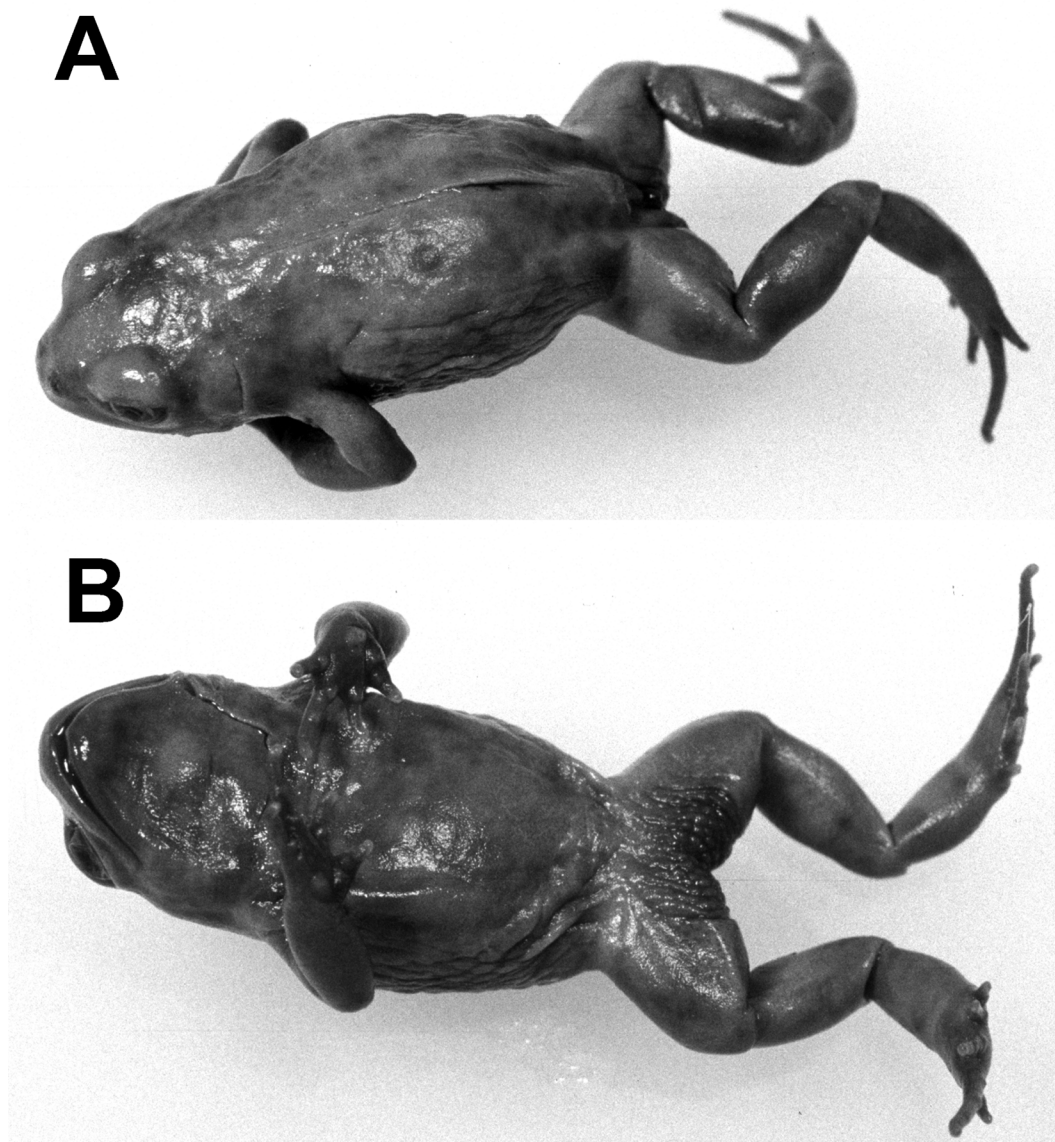


FIGURE 2. A, Dorsal and B, ventral views of the holotype of *Bombinator australis* Gray, 1835, BMNH 1947.2.20.17. Photos courtesy of H.G. Cogger.

Parker attempted to explain the discrepancy between the nominal type locality and distribution by suggesting the locality referred to “the lesser-known river of that name in eastern Australia.” However, like J. Moore (1961), we have been unable to identify any such river, with no “Swan River” listed in New South Wales in the Australian 1: 250,000 topographic map series gazetteer (Anonymous 1975). In contrast, we have had some success in tracing Joseph Wright. While there is no record of a Joseph Wright or J. Wright in either the January 1830 Muster Roll of the nascent Swan River colony (Stirling 1831), or the 1832 Census (Berryman 1979), the settler George Fletcher Moore refers to a J.W. Wright on numerous occasions in his letters and diaries (Cameron 2006). The earlier

bowdlerised version of Moore's correspondence (G. Moore 1884), refers to this person only as Mr Wright, or on one occasion J.H. Wright. Wright was the absentee holder of the land grant two blocks south of Moore's property, and Moore was keen to obtain both Wright's block, and the intervening block, "Seaton Farm", owned by William Lamb. Moore first mentions Wright on 4 February 1832, in conjunction with his thoughts on merging the three properties. At this time, he notes that Wright's property might come onto the market as "I think he [Wright] has got some place at Sidney". On 8 September 1832, he wrote to Wright in Sydney, offering to buy the land. On 25 December 1832, he reported receiving a letter from Wright. On 14 January 1833 he mentions resolving a legal case involving a Mr Marrs, a friend of Wright's from Sydney, and to whom Moore gave Wright's rifle to return to him. On 4 January 1834, he is still hoping to hear from Wright, and on 12 January, he mentions having heard from Marrs, who had seen Wright "somewhere on the Hunter River [New South Wales]. He says he is not thriving very well, but will not sell his grant here & has not written to me, nor even sent a message." On 29 June 1839, Moore reports having just received a letter from Wright "dated 23rd June—more than a year ago", via a ship coming via South Australia. Ultimately, Wright did sell his land grant to Moore (Cameron 2006: 93).

That J.W. Wright had visited the Swan River colony (Moore returning his rifle in 1833), was in Sydney in 1832, and by 1834 had moved to the Hunter Valley, enables his identification. Joseph William Wright was living in Sydney in 1831, at which time he was applying to the Supreme Court of New South Wales for registration as an attorney (Anonymous 1831a–c; State Records Authority of New South Wales: Petitions to be admitted as attorneys, solicitors and barristers, Supreme Court of New South Wales, Series 13672, File 229); his published announcement of his application refers to him as previously Attorney of His Majesty's Court of King's Bench in Ireland. By August 1833, Wright was living at Paterson in the Hunter Valley (Anonymous 1833a), and on 14 January 1834, he and his wife Sarah purchased a block of land on the Paterson River (State Records Authority of New South Wales: Registers of Memorials for Land 1825–1842, Series 12992, Archive Reel 1577). Comparison of the signatures on the two sets of documents in the State Records Authority of New South Wales reveals they are by the same hand.

Wright's application to be admitted as an attorney enables identification of his departure from Swan River and arrival in Sydney. His arrival in Sydney (as Mr Wright, via the "*Gambier*" [sic]) was touted as an opportunity for new legal blood in the colony (Anonymous 1831d). The "*Gambia*" arrived in Sydney on 4 June 1831, having left Hobart on 28 May, with Mr and Mrs Wright and family as passengers (Anonymous 1831e). In turn, Mr and Mrs Wright, and two children, arrived in Hobart on 2 May 1831 aboard the "*Eliza*", which left Swan River on 17 April, having earlier begun her voyage from London on 28 August 1831 (Anonymous 1831f). Wright's application to be an attorney in New South Wales included certification that he was living at 13 Middle Mountjoy Street in Dublin in 1830, working as a solicitor, and had earlier been sworn as an attorney of the Court of King's Bench in Ireland in Trinity Term 1823.

Wright's Swan River property was first allocated to Colonel Peter Augustus Lautour (Cameron 2006: 93), who was an absentee landholder and investor, obtaining the grant on 5 August 1829 (Stirling 1831), under the agency of the settler Richard Wells. With financial disaster looming, Wells sold the land to Wright in April 1831 for £63 (Statham 1986), presumably shortly before Wright's departure from the colony on 17 April. The "*Eliza*" had arrived in the Swan River Colony on 5 March (Berryman 1979), and it would seem likely that Wright arrived by that ship and purchased the land during the six weeks before the ship departed again for Hobart.

Although a Mr J. Wright was reported as a passenger aboard the "*Thistle*", departing Swan River on 18 February 1833 and arriving in Launceston, Tasmania, on 14 March (Anon 1833b), this is thought to be an error for Charles Henry Wright, a different settler (Erickson 1988; Cameron 2006: 63).

While we have been unsuccessful in further tracking Joseph William Wright's movements in eastern Australia, it is clear that he resided for several years in Sydney prior to and at the time of description of the species by Gray, potentially giving Wright direct access to *Pseudophryne australis*, formerly a common species in the close environs of Sydney; his ownership of property in Swan River might explain the mention of Swan River in Gray's description of *Bombinator australis*.

The types of *Pseudophryne bibronii*

There are more problematic nomenclatural complexities with the second of the currently recognised species to be described, *Pseudophryne bibronii* Günther, 1859. Günther's description of *P. bibronii* was brief, just two lines of

text (“Above brown, no white on the head; beneath white, variegated with brown. Metatarsus with two small tubercles.”), although this distinguished the species from *P. australis*, which had a pale patch on the head (Fig. 1) and a single metatarsal tubercle (as described by Günther). The description was followed by a listing of four specimens in the collection of the British Museum (now the Natural History Museum, London), and these have subsequently (Parker 1940; Moore 1961; Cogger *et al.* 1983) been considered the limits of the type series: two from “Australia” (one, *a*, donated by the Earl of Derby, the other, *b*, without known donor) and two (*c–d*) from “Van Diemen’s Land”, presented by Sir W.J. Hooker. The listing of a fifth specimen (*e*), from Swan River, presented by Sir Andrew Smith, in the appendix to the work (p. 197) has been overlooked by previous authors.

Three of these five specimens, those donated by the Earl of Derby and Sir W.J. Hooker, appear to have been lost soon afterwards, as they were not listed by Boulenger (1882) in the second catalogue of the British Museum frogs, and were similarly unable to be located by Parker (1940) or Cogger *et al.* (1983). The remaining two specimens are still extant, and were used by Boulenger (1882) to describe a new species in the genus, *P. guentheri*, a species confined to the south-west of Western Australia, while the name *P. bibronii* has consistently been applied to a wide-ranging species of south-eastern Australia.

Of the two extant syntypes of *P. bibronii*, Günther’s specimen *b*, equivalent to Boulenger’s specimen *d* of *P. guentheri*, was subsequently reregistered as BMNH 1936.12.3.131 (Parker 1940), and is now registered as BMNH 1947.2.20.20 (Cogger *et al.* 1983), while Günther’s specimen *e*, originally registered as BMNH 58.11.25.59 (and hence obtained in 1858, explaining its appearance in the appendix to Günther’s catalogue, completed in the same year) is now registered as BMNH 1947.2.20.18, and is equivalent to Boulenger’s specimen *a* of *P. guentheri*.

The two lost specimens from Van Diemen’s Land (now Tasmania) are likely to have been *P. semimarmorata* Lucas, 1892, the only species in the genus present in Tasmania (Littlejohn & Martin 1965, 1974; Martin & Littlejohn 1982), if the locality can be trusted. Their donor, the botanist Sir William Jackson Hooker, was Professor of Botany at the University of Glasgow from 1820 to 1841, then Director of the Kew Gardens from 1841 to his death in 1865. Hooker never visited Tasmania, but he cultivated an extensive international network of collectors. In Tasmania, this network began with Robert Lawrence (1807–1833), and then Ronald Campbell Gunn (1808–1881), who first began collecting for Hooker in 1832 as a result of his friendship with Lawrence (Endersby 2008). Hooker’s son, Joseph Dalton Hooker (1817–1911), visited Tasmania as botanist aboard Sir James Clark Ross’s British Antarctic Expedition of 1839–1843 (Shea 1995), and further developed an ongoing friendship with Gunn.

Although there is no extant registration entry for William Hooker’s specimens, the Accessions Book in the herpetology section at the Natural History Museum reports at least one specimen, identity unknown (BMNH 38.12.6.1) donated by Hooker from Van Diemen’s Land in 1838. If this represents the two *Pseudophryne* specimens, they would have most likely been collected by Gunn, who was based in Tasmania where he had extensive administrative duties, initially as assistant superintendent of convicts at Launceston, and then police magistrate at Circular Head (Burns & Skemp 1966). Gunn also collected reptile and amphibian specimens from Tasmania that he sent directly to John Edward Gray at the British Museum (Günther 1859; Endersby 2008), and his published letters to Hooker (Burns & Skemp 1961) record sending zoological specimens to Hooker along with his botanical collections. These include at least one frog sent to Hooker prior to 1838 (letter of 5 February 1836), and additional frogs sent a few years later (letter of 30 September 1844).

The locality and identity of the fifth syntype, specimen *a*, cannot be further determined. The 13th Earl of Derby, Edward Smith-Stanley (1775–1851) maintained an extensive collection of vertebrates at Knowsley Hall, obtaining them from a variety of collectors, including the ornithologist John Gould, his collector John Gilbert, and the naturalist John MacGillivray (Fisher & Calaby 2009). The Natural History Museum contains numerous Australian herpetological specimens donated by Derby between 1844 and 1847. Gilbert and Gould, in particular, visited numerous localities within the distribution of the genus, including south-western Australia, New South Wales, South Australia and Tasmania, prior to 1847 (Datta 1997).

In summary, of the five original syntypes of *P. bibronii* in the Natural History Museum, the two extant specimens represent *P. guentheri*, two of the missing syntypes were almost certainly *P. semimarmorata*, and the fifth syntype is indeterminate. As noted by Parker (1940), J. Moore (1961) and Cogger *et al.* (1983), this creates a nomenclatural issue, as the only extant syntypes of *P. bibronii* do not represent the species to which that name has subsequently been applied. Indeed, it is possible that none of the original syntypes previously identified represented that species. Designation of one of the extant syntypes as lectotype for *P. bibronii* would result in the name *P. bibronii* replacing *P. guentheri*, and leaving the south-eastern Australian species unnamed. Parker (1940)

recommended that the nomenclatural status quo be maintained, despite the lack of extant syntypes representing the species to which the name *P. bibronii* has been applied, and this recommendation was followed by subsequent authors (J. Moore 1961; Cogger *et al.* 1983). This situation is inherently unstable, as any lectotype designation could change application of the names, either to *P. guentheri* if one of the extant syntypes were nominated as lectotype, or to *P. semimarmorata* if the now missing Tasmanian syntypes were so designated.

Fortunately, there is a simple solution to this, overlooked by previous authors. In addition to the brief description and listing of specimens in the Natural History Museum, Günther (1859) noted that his new species *P. bibronii* was conspecific with the species named *Phryniscus australis* by Duméril and Bibron (1841). Günther's statement was both explicit (listing of *Phryniscus australis* in the synonymy of *P. bibronii*), and implicit, stating earlier on the same page, when listing the holotype of *Bombinator australis* (*Pseudophryne australis*), that Duméril and Bibron's *Phryniscus australis* was not conspecific with Gray's species. Indeed, it is likely that Günther proposed the name *P. bibronii* in reference to Duméril and Bibron's error in assuming that their *Phryniscus australis* was the same as Gray's species (in the same way that Boulenger's later naming of *P. guentheri* is likely to reflect the inclusion under *P. bibronii* of specimens of that species by Günther).

Under Article 72.4.1 of the Code of Zoological Nomenclature, “the type series of a nominal species-group taxon consists of all the specimens included by the author in the new nominal taxon (whether directly or by bibliographic reference), except any that the author expressly excludes from the type series, or refers to as distinct variants (e.g. by name, letter or number), or doubtfully attributes to the taxon”.

Article 72.4.1.1 further specifies that “for a nominal species or subspecies established before 2000, any evidence, published or unpublished, may be taken into account to determine what specimens constitute the type series”.

The unequivocal bibliographic reference by Günther of Duméril and Bibron's *Phryniscus australis* to his new species *Pseudophryne bibronii* makes the specimens of the former taxon part of the syntype series of the latter taxon. These are likely to be secondary syntypes in the sense of Dubois and Ohler (1997), although it is not possible to be sure that Günther had not directly examined them prior to his description of *Pseudophryne bibronii*, but was unable to specifically list them in his description other than by bibliographic reference, due to the nature of the publication in which the name was created—a catalogue of the specimens in the British Museum (if the latter, they would be primary syntypes).

Although Duméril and Bibron (1841) treated their *Phryniscus australis* as new (“*Nobis*”), this was merely an indication of a new combination (Bour 2012), referring Gray's *Bombinator australis* to their new genus *Phryniscus*. That their *Phryniscus australis* is not conspecific with Gray's species is evident from their description, which does not mention any pale markings on the head, a characteristic feature of *Pseudophryne australis* evident even in long-preserved specimens (pers. obs.).

Their description was based on specimens in the Museum National d'Histoire Naturelle in Paris (MNHN), stated to be obtained from New Holland by Péron and Lesueur. François Péron (1775–1810) and Charles-Alexandre Lesueur (1778–1846) were among the naturalists and artists aboard the 1800–1804 expedition of Nicolas Baudin to Australia.

There are two *Pseudophryne* specimens in the MNHN collection identified as collected by Péron and Lesueur: MNHN RA-0.5018 (Roux-Esteve 1979), one of which is now MNHN R-2008.323. Both were identified by Roux-Esteve (1979) as *Pseudophryne australis*. However, this is in error. Photographs we have examined of these specimens (Fig. 3) show that both specimens represent the taxon we know as *P. bibronii*, lacking any trace of a pale bar across the snout. They are also not *P. semimarmorata*, both specimens having strong dark and light marbling over the entire body and hindlimb venter. Both specimens have the locality “Port Jackson” [= Sydney].

With Baudin's death in Mauritius towards the end of the expedition, and the loss of most of the scientists through desertion or death, the task of compiling the published report of Baudin's expedition fell to Péron. Before succumbing to tuberculosis in 1810, he wrote the first volume of the narrative of the expedition, and in this (Péron 1807), he reported that he only collected Australian frogs while visiting Parramatta, near Sydney:

“Le long des côtes arides et sablonneuses des terres de Leuwin, d'Endracht et de Witt, je n'avois pu découvrir aucune espèce de Batraciens; j'en avois été d'autant moins surpris, que le défaut d'eau douce nous ayant semblé par-tout absolu, il étoit presque impossible à ces animaux aquatiques d'exister sur de tels rivages. Je n'en regrettois cependant pas moins de n'avoir pu me procurer un seul individu de cette grande famille de reptiles, lorsque mon séjour à Parramatta vint me mettre à même de compléter, sous ce rapport, l'ensemble de mes travaux zooiologiques sur la Nouvelle -Hollande.”

[Along the arid and sandy coasts of the lands of Leuwin, Endracht and Witt, I could not discover any species of Batrachians; I was the less surprised, as the absence of fresh water having seemed to us everywhere absolute, it was almost impossible for these aquatic animals to exist on such shores. I regretted, however, that I could not procure a single individual from this large family of reptiles, when my stay at Parramatta came to put me in a position to complete, in this respect, all my zoological studies on New Holland.]



FIGURE 3. Dorsal and ventral views of the two specimens of *Phryniscus australis* Duméril and Bibron, 1841: A–B, MNHN RA-0.5018, C–D, MNHN RA-2008.323. Photos courtesy of MNHN, Paris.

In his account of the zoological collections made around Parramatta, Péron (1807) provided preliminary descriptions of the frogs found. While most were pelodyadids, he reported two species that he identified as toads, describing these as:

“Le genre Crapaud m’offrit aussi deux espèces nouvelles, que j’ai nommées *Bufo Leucogaster* et *Bufo Proteus*; les individus de la première ont en effet le ventre d’une blancheur éclatante, et ceux de la seconde m’ont offert une grande variété de couleurs. Le Crapaud protégé est un des plus petits que l’on connoisse, car il mesure à peine 27 millimètres [1 pouce] de longueur; par ses nuances agréables et variées, il semble s’éloigner du genre dégoûtant auquel il appartient.”

[The toad genus also offered me two new species, which I named *Bufo leucogaster* and *Bufo proteus*; individuals of the former have in fact the belly of a brilliant whiteness, and those of the second offered me a wide variety of colors. The Protean Bufo is one of the smallest known, as it hardly measures 27 millimeters [1 inch] in length; by its agreeable and varied nuances, it seems to be moving away from the disgusting kind to which it belongs.]

As the surviving zoological artist of the expedition, Lesueur painted the frogs reported by Péron, and these artworks remain the collection of the Museum d’Histoire Naturelle at Le Havre, Lesueur’s home town, and the institution of which he became Director later in life. Tyler and Morère (1988) published some of the frog images, which are spread over three vellums, and were able to match some of these to manuscript descriptions in Péron’s

notebooks. It is apparent that Péron's *Bufo leucogaster* is *Crinia signifera* (Tyler & Morère 1988). His *Bufo proteus* is therefore likely to be *Pseudophryne*, the only other small ground frog genus present at the type locality. Tyler and Morère (1988) identified, but did not reproduce, a painting on the same vellum as *Pseudophryne dendyi*. However, the Baudin expedition did not land on any part of the Australian coastline within the distribution of *P. dendyi*. Through the courtesy of Gabrielle Baglione of the Museum d'Histoire Naturelle in Le Havre, we have been able to examine a photograph of the entire vellum (77003). Along with three paintings of *Crinia signifera*, one of which was reproduced by Tyler and Morère (1988), the vellum bears a painting that undoubtedly represents *P. bibronii* (Fig. 4)—the illustration shows no trace of the pale (bright yellow in life) marking across the coccygeal region typical of *P. dendyi* (Anstis 2013; Cogger 2014). This vellum is of ground frogs. The other two (77001–02) are of tree frogs (mostly Australian pelodyadids), and were reproduced by Baglione and Crémère (2009).



FIGURE 4. Painting by Charles-Alexandre Lesueur of one of the two specimens of *Pseudophryne bibronii* collected at Parramatta by François Péron. Image (extract from vellum 77003, Lesueur collection) courtesy of Gabrielle Baglione (Museum d'Histoire Naturelle du Havre).

Hence, in combination, Péron's (1807) description of the frogs collected at Parramatta, the images by Lesueur of the same frogs, the existence of two specimens of *Pseudophryne bibronii* in the MNHN collection reportedly collected by Péron and Lesueur during the time the expedition was in Sydney, originally identified as *Phryniscus australis*, and Duméril and Bibron's (1841) statement that their account of *Phryniscus australis* was based on specimens collected by Péron and Lesueur, it is possible to not only identify the two specimens MNHN RA-0.5108 and RA-2008.323 as part of the syntype series of *P. bibronii* Günther 1859, but to also identify their locality as Parramatta, near Sydney.

In order to finally stabilise the application of the name *Pseudophryne bibronii* Günther, 1859, we designate MNHN RA-2008.323, the better preserved of the two specimens identified as *Phryniscus australis* by Duméril and Bibron (1841), which are part of the syntype series of *P. bibronii* by bibliographic reference, as the lectotype of *Pseudophryne bibronii*. From the written account of the collector François Péron, it is possible to restrict the locality for this specimen to Parramatta, near Sydney.

This action also makes *Pseudophryne barkeri* Wells & Wellington, 1989 a synonym of *P. bibronii*. *Pseudophryne barkeri* was created by Wells and Wellington as a tentative name for the eastern Australian toadlets

formerly known as *P. bibronii*, due to the only extant types being *P. guentheri*. The conditional nature of the name (“...in the event that existing usage is overturned,the species-complex from eastern Australia currently referred to as *Pseudophryne bibronii* Gunther, 1858 [sic] would become *Pseudophryne barkeri* sp. nov.”), together with the lack of a defined holotype (the description only states that the holotype is from “Horsley Park”, without giving any other details of a depository, or any information that would identify a holotype), and the limited issue of the description (we are not aware of any other copies of the paper other than one in the personal library of the senior author from Wells) likely make this species invalid nomenclaturally, but our action to restrict the name *P. bibronii* to the same Sydney population as *P. barkeri* (the type localities are only 14 km apart, across the Cumberland Plain) permanently avoids any issue with the latter name.

The identity and source of *Phryniscus albifrons*

Thirteen years after their account of *Phryniscus australis*, Duméril *et al.* (1854a,b) completed their multi-volume work with a summary, issued simultaneously with the last of the illustrations that would comprise the atlas (Bour 2012). In this, they list an additional species of *Phryniscus*, *P. albifrons*, and illustrate this, along with two images they identify as *P. australis*. While the written listing of *P. albifrons* by Duméril *et al.* (1854a) provides no diagnosis, and hence might be considered a *nomen nudum*, the generic heading provides reference to a plate (Duméril *et al.* 1854b: Plate 100) that illustrates four frogs in the genus. The image of *P. albifrons* (Duméril *et al.* 1854b: Plate 100, Fig. 3) is only labelled directly with a vernacular name (Phrynisque front-blanc), and hence in isolation could also be considered nomenclaturally invalid. However, the vernacular name corresponds to the vernacular name listed alongside *P. albifrons* by Duméril *et al.* (1851a), and hence the written listing must be considered a nomenclaturally valid introduction of a new binomen, by bibliographic reference to an image, simultaneously issued, and the frog illustrated, the only specimen assigned to the species by the authors in that plate, must be the holotype (contra Cogger *et al.* 1983 and Frost 2017, who incorrectly considered the potential for syntypes). This image, without any locality provided, appears to be *Pseudophryne australis*, while the lower of the two images labelled as *Phryniscus australis* appear to us to be *P. bibronii*, potentially representing one of the two specimens collected by Péron and Lesueur. All three images are of the dorsal surface of the frogs only. Parker (1940) suggested that the top image (Plate 100, Fig. 2) represented *P. semimarmorata*, while the lower image (Plate 100, Fig. 4) was *P. bibronii*. If true, this might imply a third specimen in the type series of *Phryniscus australis*, as both of the extant syntypes are *P. bibronii*. Parker’s identification of the top illustration as *P. semimarmorata* is important in that *Phryniscus australis* Duméril & Bibron, 1841 is the type species of *Pseudophryne* Fitzinger, 1843, and hence the identity of the specimens used by Duméril and Bibron is relevant to assignment of the generic name. While *Phryniscus australis*, as used by Duméril and Bibron, is not a new species taxon, their assumption that it was the same as Gray’s *Bombinator australis* was incorrect, and hence Fitzinger’s citation of *Phryniscus australis* as the type species of *Pseudophryne* could be construed as a misidentified type species (Code of Zoological Nomenclature Article 67.13).

Parker (1940) distinguished *P. bibronii* from *P. semimarmorata* by the longer snout, greater density of dorsal tubercles and unspotted lower surface of limbs of the latter species, and reported examining specimens of both species in Tasmania. Subsequently, only *P. semimarmorata* has been considered to occur in Tasmania, with previous records of *P. bibronii* representing misidentified *P. semimarmorata* (Littlejohn & Martin 1965, 1974; Martin & Littlejohn 1982). Hence, Parker’s concept of the two species was incorrect, and his identification of the images provided by Duméril *et al.* (1854b) must be considered suspect. The image identified as *P. semimarmorata* by Parker (1940) does not appear to us to represent a *Pseudophryne* at all—the striped dorsal colour pattern, head shape and lack of dorsal tubercles are not typical of any *Pseudophryne* species. As we have shown, both of the extant specimens originally used by Duméril and Bibron for their account of *Phryniscus australis* are *P. bibronii*—neither is *P. semimarmorata*—and hence we consider that the frog illustrated as Fig. 2 of Plate 100 by Duméril *et al.* (1854b) is not one of those used in the earlier account of *Phryniscus australis*.

This leaves us with the identity of the type of *Phryniscus albifrons* to resolve. No type for this species was identified by Parker (1940), J. Moore (1961) or Cogger *et al.* (1983). Given that this species was named by Duméril *et al.* in 1854, and there was no specimen of this species (*Pseudophryne australis*) among the material collected by Péron and Lesueur and available to Duméril and Bibron in 1841, the type of *Phryniscus albifrons* is most likely to be a *Pseudophryne* specimen obtained between 1841 and 1854, when the species was described.

The major source of herpetological specimens from Australia for the MNHN collection during the period 1841–1854 was Jules Verreaux (Duméril & Duméril 1851).

Jules Verreaux operated largely through the family firm, Maison Verreaux, preparing and selling taxidermied and other natural history specimens. While his activities in South Africa have been the subject of attention (Molina 2002; Plug 2014), details of his subsequent visit to Australia between 1842 and 1847 are poorly-known (Musgrave 1932; Iredale 1945). Through the recent digitisation of Australian newspapers by the National Library of Australia's Trove project, it is possible to provide some dates for the first part of Verreaux's time in the country. He arrived in Hobart aboard the French naval vessel "*Le Rhin*" on 27 December 1842 (Anonymous 1842), the vessel being *en route* to New Zealand, where it was to provide support to the French colony of Akaroa (Shea 2016). Together with a servant and four cases of natural history specimens, Verreaux travelled from Hobart to Sydney in April 1844, departing Hobart on 17 April, and arriving in Sydney on 21 April aboard the ship "*Louisa*" (Anonymous 1844a,b). A few months later, Verreaux married Marie Eulalie Clotilde Hibert on 13 July at St Mary's Chapel in Sydney (Anonymous 1844c). He seems to have spent much of the following year in and around Sydney, as four cases of natural history specimens from Verreaux were sent from Sydney to London aboard the "*General Hewitt*" on 21 April 1845, another two cases aboard the "*Penyard Park*" on 21 July 1845 for the same destination, and one case aboard the "*Shamrock*" on 3 October 1845 for Launceston (Anonymous 1845a–c). His wife departed for London from Sydney aboard the "*Rajah*" on 21 October 1846 (Anonymous 1846). His activities during the next year, prior to his return to Paris in late 1847 (Anonymous 1848), are still unknown. However, Verreaux's herpetological specimens in the MNHN collection include material with nominal localities Tasmania, Swan River Colony, King George's Sound, Sydney (including Port Jackson and George's River), Hunter River [New South Wales], Port Macquarie [New South Wales], Evans Head [New South Wales] and Moreton Bay (Duméril & Duméril 1851).

Verreaux's ornithological specimens are notorious for their incorrect localities (Mearns & Mearns 1998; Olson *et al.* 2004), and his Australian herpetological collections have similar issues, with the type of the skink *Anomalopus verreauxii* and specimens of *Tiliqua rugosa* (as *Trachysaurus rugosus*), *Hemiergus quadrilineatus* (as *Chelomeles quadrilineatus*), *Underwoodisaurus milii* (as *Gymnodactylus milii*), *Pygopus lepidopodus* (as *Hysteropus novaehollandiae*), *Pogona barbata* (as *Grammatophora barbata*), *Varanus tristis* (as *Varanus punctatus*) and *Morelia spilota* (none of them members of the Tasmanian herpetofauna) bearing the locality Tasmania, a specimen of the southeastern Australian skink *Hemiergus decresiensis* from Moreton Bay in Queensland, and a specimen of the Sydney region endemic gecko *Phyllurus platurus* (as *Gymnodactylus platurus*) nominally from King George's Sound in Western Australia (Duméril & Duméril 1851).

The MNHN collection contains four specimens, all originally under the registration number RA-0.5019, purportedly collected by Verreaux from Moreton Bay, and identified as *Phryniscus albifrons*. Three of these have subsequently been reregistered as RA-2012.4446–4448. We have examined photographs of all four specimens. MNHN RA-0.519, RA-2012.4446 and RA-2012.4447 are *Crinia signifera* Girard, 1853, a species that was not described until October 1853, less than a year before the publication of *Phryniscus albifrons* (Bour 2012) and for which the original description was confined to a few anatomical details, making identification of the species nearly impossible until a more detailed description appeared five years later (Girard 1858). These three specimens represent the striped form of *Crinia signifera*. It is possible that one of these specimens was the basis for the illustration of *Phryniscus australis* by Duméril *et al.* (1854b: Plate 100 Fig. 2), which is similarly patterned. The fourth specimen, RA-2012.4448 is a *Pseudophryne*. The specimen is very faded, but on viewing the specimen under liquid, it is possible to discern a weakly developed but poorly contrasting pale patch on the head dorsum and a coccygeal stripe, as well as a few pale spots on the body dorsum (Fig. 5). The pale markings, particularly the edges of the head markings, do not correspond with the elements illustrated by Duméril *et al.* (1854b), and hence we are unable to convince ourselves that this specimen is the missing type of *Phryniscus albifrons*. However, it certainly does not represent any of the three species of *Pseudophryne* from the Brisbane (the Moreton Bay colony until 1859, when the name changed) area: *P. major* Parker, 1940, *P. coriacea* Kieferstein, 1868 or *P. raveni* Ingram & Corben, 1994. The latter two species have a uniformly pale dorsum in preservative (red or light coppery brown, respectively, in life), and hence lack a distinct coccygeal stripe or a sharp disjunction between pale head and darker body dorsum. *Pseudophryne major* may possess a slightly paler patch on the head dorsum and a pale coccygeal stripe (Anstis 2013), but typically has a pair of dark paravertebral stripes along the dorsal surface, associated with a few low tubercles, and dark marks on the eye bulges that mark the disjunction between the pale head and darker body dorsum (Vanderduys 2012), features that are lacking in MNHN RA-2012.4448.

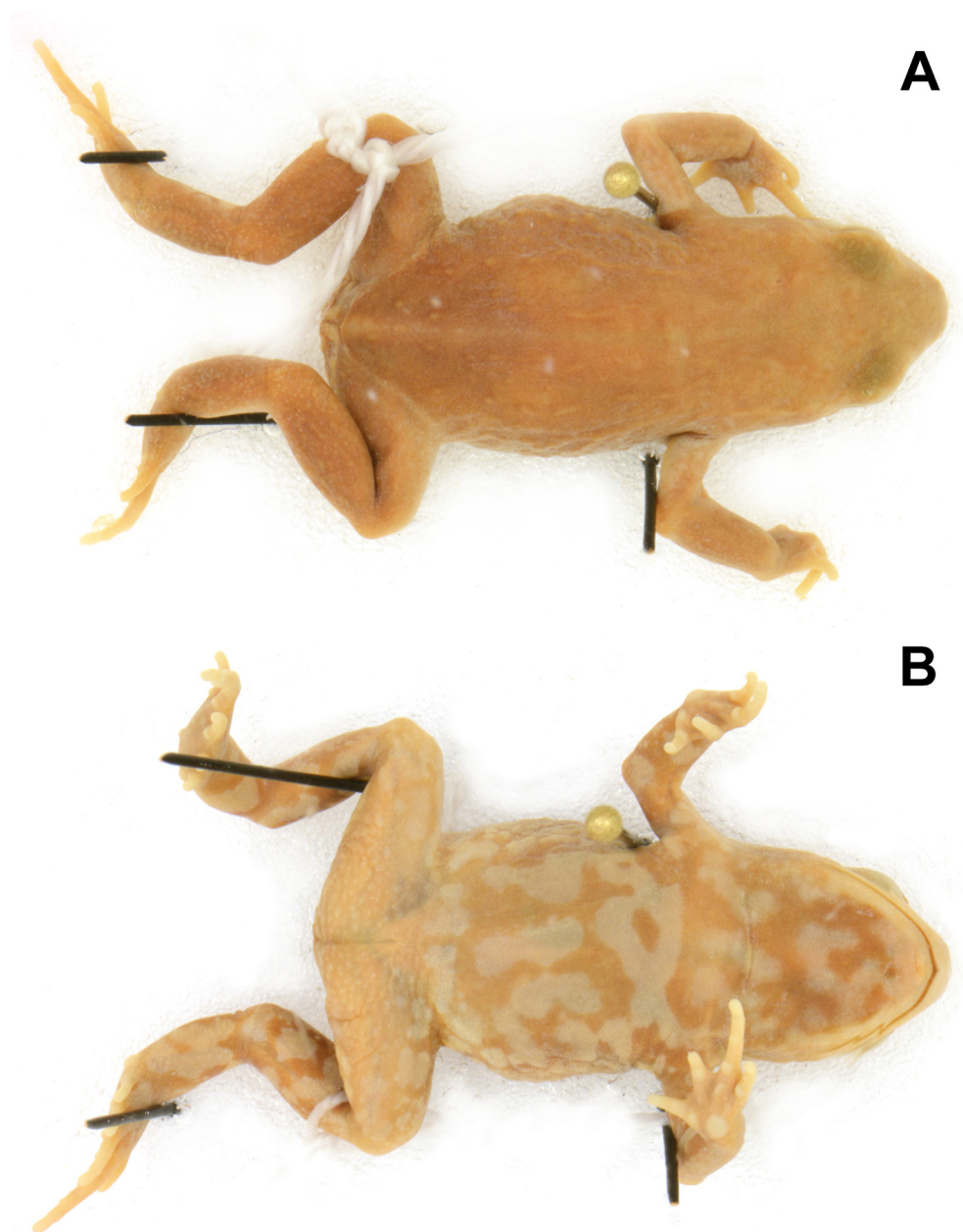


FIGURE 5. A, Dorsal and B, ventral views of the only extant *Pseudophryne* specimen collected by Jules Verreaux, MNHN RA-2012.4448. Photos courtesy of Antoine Fouquet (MNHN, Paris).

The specimen is most likely to represent *P. australis*, a species which does not occur in the Brisbane district, and hence the nominal Moreton Bay locality for the specimen is likely to be yet another error among Verreaux's collections. It is possible that the holotype of *Phryniscus albifrons*, which as illustrated has a very distinctive zig-zag interdigitation between the pale head and the darker body dorsum, was damaged during the preparation of the illustration and subsequently discarded. The alternative view, that the illustration is inaccurate and that MNHN RA-2012.4448 is the holotype of *Phryniscus albifrons*, is likely to be impossible to prove.

While the identity of the holotype, if extant, is not able to be confirmed, the identity of *Phryniscus albifrons* is not in doubt, as the illustration provided by Duméril *et al.* (1854b) only matches *Pseudophryne australis*, and hence no neotype is needed.

The new data on type specimens, localities and collectors we provide in this paper clarify the application of names to several species of *Pseudophryne*, facilitating work in progress on species boundaries in this genus. Such historical detective work is necessary to resolve the frequent inadequacies of early taxonomic work, enabling them to be married with modern studies that use techniques not envisaged in the early nineteenth century.

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