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A three way division of the Australian legless lizard, *Crottyopus jamesbondi* Hoser, 2017 and a new species of *Wellingtonopus* Hoser, 2017.

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ABSTRACT

Until 2017, *Crottyopus jamesbondi* Hoser, 2017 had been regarded as a variant of the widespread and well-known taxon, *C. australis* (Kluge, 1974).

Two apparently isolated outlier populations of *C. jamesbondi* in Western Australia as identified by Hoser (2017) occurring at Cape Range and south-central Western Australia in Western Australia are herein formally described as new species according to the rules as set out in the current edition of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

These are *Crottyopus scottmarshalli sp.nov.* from south central, Western Australia and *C. daveausteni sp. nov*. from the Cape Range in Western Australia.

Both new species and *C. jamesbondi* diverged from one another at least 5 million years ago, supporting the contention that all should be treated as separate and allopatric species.
A divergent population of *Wellingtonopus butleri* (Storr, 1987) from the Cape Range area of Western Australia is also herein formally named as a new species *Wellingtonopus matthingleyi sp. nov.*.

Keywords: taxonomy; nomenclature; Australia; Western Australia; lizard; legless lizard; Pygopodidae; *Crottyopus*; *jamesbondi*; *australis*; *Wellingtonopus*; *butleri*; new species; *scottmarshalli*; *daveausteni*; *matthingleyi.*

INTRODUCTION

An ongoing audit of Australasian herpetofauna over some decades has yielded numerous potentially unnamed species and genera, including 13 well-defined Pygopodid species as identified and formally named by Hoser (2017).

A planned trip in late winter / early Spring to Western Australia in 2017 seeking further material of three other species was aborted after I was unable to avoid litigation against a police-protected criminal named Michael Alexander, of Launching Place, Victoria and a business he scammed in the form of Bunnings Limited (the well known seller of Chinese made hardware in Australia) for registered trademarks infringement.

Alexander had used the long registered Australian trademarks "snakeman" (Registered trademark number: 1175589) and "snake man" (Registered trademark number: 1214301) to divert Snakebusters reptile show clients to his unsafe alternative and was therefore putting people's lives at risk.

He also defamed Snakebusters to potential clients, making recklessly false claims and in so doing seriously undermined many decades worth of valuable wildlife conservation work.

Consequently and as a matter of urgency the trademark infringement litigation was of critical importance and took priority over other matters.

By end of August 2017, we got court orders against the two infringing parties (Riley 2017), significant financial damages and compensation from Bunnings (Pullen 2017), as well as corrective advertising in the tabloid newspapers (Pullen 2017). Furthermore both law-breaking trademark infringing parties signed court enforceable undertakings to comply with the law and not infringe again, or get others to do so (Pullen 2017, Alexander, 2017).

There was also a written court-enforceable undertaking not to engage in any further taxonomic vandalism or other forms of misappropriation of the intellectual property of Raymond Hoser, including the illegal renaming of species or other taxa named by Raymond Hoser.

The undertaking also expressly prohibited the getting of others to do so in any way.
This court enforceable and approved undertaking (assuming it would be complied with) is a significant win for the stability of Zoological Nomenclature and should have put an end to the law-breaking mischief of Alexander's cohort of thieves and associates, including Wolfgang Wuster, Mark O'Shea, Wulf Schleip, Scott Thomson, Anders Rhodin and R. Graham Reynolds, who have all been a party to illegally renaming species or genera properly named in the past, with their actions in breach of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) and various intellectual property laws.
For details of the relevant acts of taxonomic vandalism to year 2015, see Hoser (2015a-f) and sources cited therein.

As of early January 2018, both Alexander and Bunnings have re-offended as have a number of others they have directed to (also in breach of the signed court orders), with Michael Alexander in particular, aggressively acting in breach of court orders and his signed undertaking of August 2017 (Alexander, 2017).

Therefore as of January 2018, more litigation against one or both for further trademark infringement and breach of orders and undertakings is pending and likely to commence about May 2018.

Because of this and on the basis that fieldwork in terms of the three relevant species by myself is not likely in the foreseeable future, and noting the limited available study material, I have made a decision to publish descriptions of all three species.

This is so that all three biological entities are properly named and highlighted in the scientific literature and associated databases. This will enable others to get government permission to collect more material so that these species can be further studied and protected and managed by governments and their employees, assuming they see fit to do so.

These three taxa have been known as distinct at the species level for some time (e.g. Brennan 2014), and this distinction is known to be based on morphological and molecular evidence as well as distributional disjunction.

Brennan (2014) provides substantial evidence for the specific status of the three forms formally described for the first time herein. It is therefore not necessary for me to rehash this material here or to falsely present the same data as "new".

However it is also worth making mention of fig 3.5 in Brennan (2014) which shows a divergence of two of the three newly described forms and *Crottyopus jamesbondi* Hoser, 2017 (the closest related taxon) as being in excess of 5 MYA from one another and less than 10 MYA.

This archaic timeline of divergence, morphological divergence and the allopatric distribution of those relevant forms confirms the necessity to identify each as full species.

In terms of the new species of *Wellingtonopus* Hoser, 2017, previously identified as an unnamed taxon associated with *Wellingtonopus butleri* (Storr, 1987), or alternatively as *Wellingtonopus butleri* (Storr, 1987), the grounds for recognition as a separate species are also compelling.

The known location of this new species is the Cape Range area of Western Australia, well north of the known distribution of *W. butleri*, both being separated by a well known biogeographic barrier in the form of a hyper arid zone, which also constrains several other species with similar habitat requirements.

Hence it is reasonable to infer that both taxa are distributionally disjunct and likely to have been so for some millions of years, based on known past climates in the region. As they are also morphologically distinguishable from one another, it makes sense that they be treated as two species and not one.

MATERIALS, METHODS, AND NOTES RELEVANT TO THE DESCRIPTIONS HEREIN.

In hindsight, the following descriptions should have been published with the paper Hoser (2017). Rather than repeating or rehashing material from Hoser (2017), I merely note the following key points.

The audit that applied to that paper applies herein. The material and methods as outlined in that paper, are wholly adopted herein, as is the obvious result. This is the description of three new species.

The key literature reviewed is the same as for Hoser (2017) and the taxonomic conclusions arising herein are the same, save for the addition of two new species, previously grouped within *Crottyopus jamesbondi* Hoser, 2017 and herein described as new and description of another taxon previously associated with *W. butleri*.

The notes relevant to the 13 species descriptions in Hoser (2017) apply herein, save for the fact that all names first used in that paper must take priority over any first used herein in order to remain compliant with the current edition of *the International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Because Hoser (2017) cites all relevant literature relied upon, those papers are not cited again here. Instead I refer all interested parties to read Hoser (2017), which is readily available in both hard copy and an identical online version (with different ISSN).

CROTTYOPUS SCOTTMARSHALLI SP. NOV.

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number: R137675 collected from, 74 km north-west of Balladonia Roadhouse, Western Australia, Latitude -32.03 S, Longitude 122.92 E, found inside a dead Spinifex clump. The Western Australian Museum, Perth, Western Australia is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number: R137676 collected from, 74 km north-west of Balladonia Roadhouse, Western Australia, Latitude -32.03 S, Longitude 122.92 E.

Diagnosis: *Crottyopus daveausteni sp. nov*. and *C. scottmarshalli sp. nov*. have until now been treated as west Australian populations of *C. jamesbondi* Hoser, 2017. Refer to Hoser (2017) for a full diagnosis of that taxon, which can also be used as being diagnostic (in part at least) for these three. Furthermore detailed diagnostic information for the three relevant taxa (identified under different names) is also found in Brennan (2014).

Both *Crottyopus scottmarshalli sp. nov*. and *C. daveausteni sp. nov*. are separated from *C. jamesbondi* by the absence of a muddied grey dorsal head surface and yellow flushed lips and snout as seen in *C. jamesbondi*. Instead, these species appear as a somewhat weakly patterned intergrade between *C. jamesbondi* (less patterning) and both *C. australis* (Kluge, 1974) and *C. hebesa* (Maryan, Brennan, Adams and Aplin, 2015) (strong patterning).

C. scottmarshalli sp. nov. lacks even a slight lightening flush of the lips, whereas there is a very limited amount in *C. daveausteni sp. nov*. this difference readily separating the otherwise morphologically similar species.

C. scottmarshalli sp. nov. is yellowish brown in dorsal colour, versus more brownish in *C. jamesbondi* and brown, with a slight grey tinge in *C. daveausteni sp. nov.*.

Distribution: So far this species is only known from the type locality and the two type specimens.

Etymology: Named in honour of Scott Marshall of Ringwood, Victoria, Australia, a businessman and football coach, in recognition for his immense contribution to girls and women's Australian Rules Football in Australia, in particular his enormous contribution to coaching a number of girls teams with incredible on and off field success. Scott Marshall is regarded by his peers as the best girls Football coach in the State of Victoria., currently (as of 2018) coaching girls from the Melbourne suburb of Park Orchards.

CROTTYOPUS DAVEAUSTENI SP. NOV.

Holotype: A preserved female specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number: R132470 collected from Shothole Canyon, Cape Range National Park, Western Australia (Lat. -22º03' S, Long. 114º01' E). The Western Australian Museum, Perth Western Australia is a government-owned facility that allows access to its holdings.

Diagnosis: *Crottyopus daveausteni sp. nov*. and *C. scottmarshalli sp. nov*. have until now been treated as west Australian populations of *C. jamesbondi* Hoser, 2017. Refer to Hoser (2017) for a full diagnosis of that taxon, which can also be used as being diagnostic (in part at least) for these three. Further diagnostic information for the three relevant taxa is also found in Brennan (2014).

Both *Crottyopus scottmarshalli sp. nov*. and *C. daveausteni sp. nov*. are separated from *C. jamesbondi* by the absence of a muddied grey dorsal head and yellow flushed lips and snout as seen in *C. jamesbondi*. Instead, these species appear as a somewhat weakly patterned intergrade between *C. jamesbondi* (less patterning) and both *C. australis* (Kluge, 1974) and *C. hebesa* (Maryan, Brennan, Adams and Aplin, 2015).

C. scottmarshalli sp. nov. lacks even a slight lightening flush of the lips, whereas there is a very limited amount in *C. daveausteni sp. nov*. this difference readily separating the otherwise morphologically similar species.

C. scottmarshalli sp. nov. is yellowish brown in dorsal colour, versus more brownish in *C. jamesbondi* and brown, with a slight grey tinge in *C. daveausteni sp. nov*..

Distribution: So far this species is only known from the type locality and the single holotype specimen.

Etymology: Named in honour of David (Dave) Austen, a well-known Real Estate agent in Melbourne, Victoria, Australia in recognition of his many sacrifices in the public interest for a wide range of causes, including assisting Snakebusters with their critically important wildlife conservation and education work in numerous ways over many years.

WELLINGTONOPUS MATTHINGLEYI SP. NOV.

Holotype: A preserved specimen at the Western Australian Museum in Perth, Western Australia, Australia, specimen number: R156449 collected at the Learmonth Air Weapons Range, immediately south of the Cape Range National Park, Western Australia, Australia, Latitude -22°25 S., Longitude 113°46 E.

The Western Australian Museum, Perth, Western Australia is a government-owned facility that allows access to its holdings.

Diagnosis: *Wellingtonopus matthingleyi sp. nov*. was until now treated as a variant of *W. butleri* (Storr, 1987), from which it is readily separated by being olive in colour as opposed to brown.

W. matthingleyi sp. nov. has a well defined white patch posterior to the eye, which is not the case in the otherwise similar *W. stevebennetti* Hoser, 2017, also being olive in ground colour.

The bars or spots on the upper labials are well-defined in *W. matthingleyi sp. nov*., versus indistinct in *W. stevebennetti.*

W. stevebennetti was until 2017 treated as an eastern Australian population of *W. butleri.*

Wellingtonopus matthingleyi sp. nov. (treated as a form of *W. butleri* by Hoser, 2017) is readily separated from *W. haroldi* Storr, 1987 by colouration as outlined in Hoser (2017) and distribution as outlined in Storr, Smith and Johnstone (1990).

Wellingtonopus matthingleyi sp. nov., *W. stevebennetti* Hoser, 2017 and *W. butleri* (Storr, 1987) are separated from the other species of *Wellingtonopus* Hoser, 2017 and the six genera *Aclys* Kluge, 1974, *Crottyopus* Hoser, 2017, *Delma* Gray, 1831, *Pseudodelma* Fischer, 1882,, *Sloppopus* Hoser, 2017, and *Wellsopus* Hoser, 2017. (all previously treated as being within *Delma*, prior to the publication of Hoser 2017) by the following suite of characters: 15-18 mid-body rows (usually 16), and smooth dorsal scales; no pale stripes on the body or tail; nasal and first supralabial are not fused anterior to the nostril; no dark transverse bands posterior either to the parietal scales or to any dark transverse band fully or partly enclosing the parietal scales; usually seven scales on top of the snout between the rostral and frontal; usually three often enlarged pre-anal scales; lateral lip pattern and dorsal head bands are absent or just flecking as opposed to lined; fourth or fifth supralabial is usually below the eye; dark pigment on the throat or venter may be present or absent; ventral scales with or without dark edges; there are usually 16 scales along a line across the top of the head and usually 17 scales along a line across the throat, each line extending from the angle of the mouth on each side; there is no dark dorso-lateral stripe extending from the posterior third of the body to the tail, dorsal scales are dark brown in colour and finely etched with blackish colour; ventral scales lack dark edges, or if present are indistinct.

Distribution: *Wellingtonopus matthingleyi sp. nov*. is only known from the type locality in Western Australia and believed to be endemic to the Cape Range bioregion.

The distribution of *W. butleri* (Storr, 1987) is in the region south of the very sandy hyper-arid zone that lies east of the Kennedy Range and west of the coast.

W. stevebennetti Hoser, 2017 occurs in drier parts of inland Eastern Australia, generally around the Murray/Darling basin and nearby areas to the west.

Etymology: Named in honour of Matthew (Matt) Hingley of Queensland, Australia, formerly of Melbourne, Victoria, Australia, in recognition of some decades of important work with reptiles and educating the public about the same at wildlife displays and the like.

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CONFLICT OF INTEREST

The author has no known conflicts of interest.