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A taxonomic revision of the *Vipera palaestinae* Werner, 1938 species group, with the creation of a new genus and a new subgenus.

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ABSTRACT

Vipera palaestinae Werner, 1938, a well-known species to biologists, has been neglected by taxonomists. This paper rectifies the anomaly and herein defines a new genus to accommodate the species, named as *Maxhoservipera* gen. nov.. Two allied species, currently placed in the genus *Macrovipera* are also moved into this new genus. Those taxa, known before now as *Macrovipera deserti* (Anderson, 1892) and *M. mauritanica* (Duméril and Bibron, 1848) are further placed within a newly diagnosed subgenus *Laidlawus* subgen. nov.. This enables the two subgroups within the main genus to be properly identified.

Keywords: Taxonomic revision; Vipera; palaestinae; Werner; genus; new; Vipera; *Macrovipera; Maxhoservipera; Laidlawus; deserti*; *mauritanica; Daboia; russelii;* Hoser; snake; subgenus.

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INTRODUCTION

The viperidae have been the subject of taxonomic interest since zoologists commenced looking at such animals using current classification systems in the 1700's. For most of the 20th century, the majority of viper species were simply placed within the genus *Vipera*. Recognising the paraphyletic nature of the group, taxonomists have split off a number of genera to accommodate clearly distinct species-groups.

With the introduction of genus-wide screening via molecular and other methods, relationships between Viper species have become better known.

To that end, previously erected genera that accommodate species formerly placed within *Vipera* including *Macrovipera*, *Daboia* and *Montivipera* have become widely accepted by most herpetologists.

While the three genera *Vipera*, *Macrovipera*, *Daboia* all include type species and other component taxa clearly related to the species known as *Vipera palaestinae* Werner 1938, it is my considered view that none are sufficiently close, either morpologically, in habits or molecularly to warrant placement of this species within those genus groups.

To compound matters, neither *Vipera palaestinae* Werner 1938 or *Macrovipera mauritanica* and *M. deserti*, both the latter of which are clearly more closely related to this taxon, than any other, are particularly similar to or closely related to any of the other genera (see Pyron, et. al. 2011) other than by virtue of convergence.

It is conceded that on the evidence of Pyron et. al. (2011) and others such as Garrigues et. al. (2005) and Stümpel et. al. 2009, that the genus *Daboia* is that which is most closely related to the trio of species subject of this paper.

However the component species within the genus as widely recognised (type species *Daboia elegans* Gray, 1842 being synonymous with *russelii*) are still sufficiently different to those subject here to warrant the creation of a new genus.

D. russelii is noticeably thinner than the other taxa no doubt as a result of it's significantly different feeding ecology driving

it's evolution in a different direction. Colouration and other attributes set this taxon apart from the other morphologically conservative vipers in the *palaestinae* complex.

I also concur with Hermann et. al. (1992) who restricted *Daboia* to the species taxon *russelli.*

Note however that the very similar taxon *Daboia siamensis* was resurrected from synonymy with *russelii* by Thorpe et. al. in 2007.

It already increases the size of the genus *Daboia* to two similar species. With yet more already named and recognised subspecies being flagged as being likely "full" species by Thorpe at. al. 2007, the argument against splitting *Daboia* on the grounds of an unwanted creation of monotypy cannot be sustained.

Furthermore I note that the findings of Stümpel et. al. 2009 (p. 182, fig. 1) shows *Montivipera* and *Macrovipera* (*lebetina* only) both being more closely related to one another, yet placed in separate named genera, than the taxa *russelii* (alone) and (versus) *palaestinae* and *mauritanica* (as a more closely related pair) that he then placed in the pre-existing named genus *Daboia*.

This placement was inconsistent on the basis of the evidence presented.

Therefore to correct this anomaly, *Vipera palaestinae* Werner 1938 is placed in it's own new genus, namely *Maxhoservipera* gen. nov..

Two other taxa, namely those known currently as *Macrovipera mauritanica* and *M. deserti* are clearly not particularly close to the nominate type species for that genus, namely *M. lebetina*, (and cogener *M. schweizeri*)(refer again to Stümpel et. al. 2009 (p. 182, fig. 1)) and yet are clearly more closely affiliated with the taxon *Vipera palaestinae* Werner 1938 (refer to Pyron et. al. 2011) so are included in the new genus erected here.

Within this genus, currently consisting of three taxa, the two species formerly placed within *Macrovipera* form a distinct group and are therefore placed within a newly named subgenus (*Laidlawus* subgen. nov.) to properly account for this position.

The viperidae are of course a well-known genus of generally medium to large-sized stout-bodied venomous snakes from with a distribution centred on the continental masses of Eurasia and Africa.

On close inspection they are not likely to be confused with any other snakes on the basis of their large retractable fangs that become erect when the mouth opens, highly developed venom apparatus and their general size and shape.

GENUS *MAXHOSERVIPERA* GEN. NOV.

Type species: *Vipera palaestinae* Werner 1938

Diagnosis: Separated from all other vipers by the following suite of characters: generally large (average 70-90 cm total length as adults), never more than 150 cm total length as adults, of very thick-set viperine build (stout and heavy); and keeled dorsal scales, with the keels forming a series of ridges running longitudinally along the body; the lowest row of scales (before the ventrals) does not have keels, the tail is short; the head is large, thick and triangular in shape; vertically elliptical pupil in a distinct medium-sized eye, the body pattern usually being in a chain-like configuration, usually with darker diamonds along the spine and broken bands on the flanks, over a lighter ground-type colour; 10-12 supralabials with 3-4 rows of scales separating the supralabials from the eyes; 25-33 mid body rows, 140-180 ventrals, 40-50 all divided subcaudals, two pairs of chin shields, the front ones noticeably enlarged; separated from all other vipers except the Russell's viper (*Daboia*) by the presence of a dark blotch or stripe running vertically from the top of the mouth into the eye, although this may appear faded in large snakes; separated from the Russell's viper by the less thick-set build of the Russell's viper and the fact that the dark blotch running into the eye is considerably wider than the eye, as opposed to being roughly the same width. The Russell's viper is further separated by its dorsal pattern which is not in the zig-zag configuration seen in this genus. The pattern in *Daboia* is a color pattern consisting of a deep yellow, tan or brown ground color, with three series of dark brown spots that run the length of its body. Each of these spots has a black ring around it, the outer border of which is intensified with a rim of white or yellow, but giving an impression of ovals, smooth circles or similar as opposed to the more typical viperine zig-zag or chain pattern. The dorsal spots, which usually number 23–30, may grow together, while the side spots may break apart.

The taxon *palaestinae* (subgenus *Maxhoservipera* subgen. nov.). is separated from others in the genus by the configuration of the blotch running to the eye. In this taxon it is of continuous thickness from the labial to the eye, narrowing slightly from the rear as one moves towards the eye.

By contrast, in the other two taxa *deserti* and *mauritanica* (subgenus *Laidlawus* subgen. nov.) one has the blotch narrowing considerably as it meets the eye giving it a triangular appearance.

Vipers are distinct, usually thick-set snakes with a well developed venom apparatus and large retractable fangs that fold into the mouth when not in use. The thick-set build relates to the ambush predator feeding plan on the snakes.

They have large fangs used to hold prey when bitten and a heavy body with which to hold down struggling prey, usually by force of weight and holding with a stiff neck as the prey is bitten and subdued.

This genus is distributed disjunctly.

M. palaestinae is restricted to the general region of Palestine, including Israel, Lebanon, Jordan and Syria. *M. deserti* and *M. mauritanica* occur in north-west Africa.

Etymology: Named in honour of my Sydney-based cousin Max Hoser, who spent many days with me in my youth catching snakes and other critters in the 1960's and 1970's, as well as recognition of his vital public service work in the decades since.

Species in genus *Maxhoservipera* gen. nov.

M. palaestinae (Werner 1938)

M. deserti (Anderson 1892)
M. mauritanica (Duméril and Bibron 1848)

SUBGENUS *LAIDLAWUS* SUBGEN. NOV.

Type species: *Vipera deserti* Anderson 1892

Described as: *Vipera lebetina* var. *deserti* Anderson 1892:20.

Diagnosis: The taxon *palaestinae* (subgenus *Maxhoservipera* subgen. nov.). is separated from snakes in this subgenus by the configuration of the blotch running to the eye. In this taxon it is of continuous thickness from the labial to the eye, narrowing slightly from the rear as one moves towards the eye.

By contrast, in the other two taxa *deserti* and *mauritanica* (subgenus *Laidlawus* subgen. nov.) one has the blotch narrowing considerably as it meets the eye giving it a

triangular appearance.

The diagnosis separating all *Maxhoservipera* gen. nov. from all other vipers follows here:

Separated from all other vipers by the following suite of characters: generally large (average 70-90 cm total length as adults), never more than 150 cm total length as adults, of very thick-set viperine build (stout and heavy); and keeled dorsal scales, with the keels forming a series of ridges running longitudinally along the body; the lowest row of scales (before the ventrals) does not have keels, the tail is short; the head is large, thick and triangular in shape; vertically elliptical pupil in a distinct medium-sized eye, the body pattern usually being in a chain-like configuration, usually with darker diamonds along the spine and broken bands on the flanks, over a lighter ground-type colour; 10-12 supralabials with 3-4 rows of scales separating the supralabials from the eyes; 25-33 mid body rows, 140-180 ventrals, 40-50 all divided subcaudals, two pairs of chin shields, the front ones noticeably enlarged; separated from all other vipers except the Russell's viper (*Daboia*) by the presence of a dark blotch or stripe running vertically from the top of the mouth into the eye, although this may appear faded in large snakes; separated from the Russell's viper by the less thick-set build of the Russell's viper and the fact that the dark blotch running into the eye is considerably wider than the eye, as opposed to being roughly the same width. The Russell's viper is further separated by it's dorsal pattern which is not in the zig-zag configuration seen in this genus. The pattern in *Daboia* is a color pattern consisting of a deep yellow, tan or brown ground color, with three series of dark brown spots that run the length of its body. Each of these spots has a black ring around it, the outer border of which is intensified with a rim of white or yellow, but giving an impression of ovals, smooth circles or similar as opposed to the more typical viperine pattern. The dorsal spots, which usually number 23–30, may grow together, while the side spots may break apart.

Vipers are distinct, usually thick-set snakes with a well developed venom apparatus and large retractable fangs that fold into the mouth when not in use. The thick-set build relates to the ambush predator feeding plan on the snakes.

They have large fangs used to hold prey when bitten and a heavy body with which to hold down struggling prey, usually by force of weight and holding with a stiff neck as the prey is bitten and subdued.

This subgenus (*Laidlawus* subgen. nov.) is distributed in the North Africa region only.

Etymology: Named in honour of Michael Laidlaw of Ringwood for valued services to reptile education, science and conservation.

Species in subgenus *Laidlawus* subgen. nov.

M. deserti (Anderson 1892)
M. mauritanica (Duméril and Bibron 1848)

SUMMARY

Notwithstanding short-term resistance to any changes in existing taxonomy and nomenclature, the evidence is already clearly in support of the taxonomy and nomenclature within this paper.

It is also my firm belief that taxonomists have in the past failed to utilize levels of classification regulated by the ICZN code, including for example subgenus, tribe and subtribe, hence the utilization of subgenus in this paper.

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Most have been named previously either at the end of other papers or in the relevant sections of my nine books.

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