

## **A new species of Freshwater Crocodile from the Bird's head region of New Guinea.**

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### **ABSTRACT**

Until 2012 all Freshwater Crocodiles from the Island of New Guinea were treated as a single species-level taxon.

Best known as *Crocodylus novaeguineae* Schmidt, 1928, Hoser (2012), divided the taxon as then recognized into two species. The nominate form from north of the main cordillera in the vicinity of the Sepik River basin remained *novaeguineae*, although Hoser (2012) placed it within the genus *Oopholis* Gray, 1844.

The distinctive southern form with a distribution centred on the Fly River system was formally named for the first time as *O. adelynhoserae* Hoser, 2012, based on obvious morphological differences between both the type (Sepik River area) form and itself.

This paper formally names for the first time as a new species, the morphologically distinct population from the Bird's Head region of West Papua in Indonesia.

Intensive killing of specimens by natives in the range of this taxon has already made this a threatened species.

**Keywords:** Taxonomy; crocodile; freshwater; New Guinea; Irian Jaya; West Papua; *Crocodylus*; *Oopholis*; *novaeguineae*; *adelynhoserae*; *mindorensis*; *johnsoni*; *jackyhoserae*; Subgenus; *Philas*; Gray; new species; *oxyi*.

### **INTRODUCTION**

Hoser (2012) provided an updated genus-level taxonomy for the living Crocodiles including the description of three new tribes, a new genus, and two new species.

Hoser (2012) also resurrected a number of previously available, but until then little-used names for various species groups including the genus *Oopholis* Gray, 1844.

One species named by Hoser (2012) was a Freshwater Crocodile from the Liverpool River in the Northern Territory Australia and the other the southern New Guinea Freshwater Crocodile, previously treated as a variant of "*Crocodylus novaeguineae* Schmidt, 1928".

There is no need to repeat the detail of that paper herein.

I do however mention that a law-breaking group best known as the Wolfgang Wüster gang of thieves (as detailed in Hoser 2015a-f) loudly denounced the taxonomy and nomenclature within the Hoser (2012) paper.

Notwithstanding these denials, it is interesting to note that a number of websites they control (e.g. Wikipedia) now accept as self-evident that there are two different forms of Freshwater Crocodile on the main part of the Island of New Guinea.

As of 17 April 2018, at [https://en.wikipedia.org/wiki/New\\_Guinea\\_crocodile](https://en.wikipedia.org/wiki/New_Guinea_crocodile), is written:

"A separate population is found in the southern half of the island, with a range that extends from southeastern Papua New Guinea to the Indonesian provinces of Papua and West Papua. It is separated from the northern population by the New Guinea

Highlands, a mountain range that runs along the centre of the island. DNA analysis has revealed these to be genetically separate populations, and there are some differences in their morphology and behavior."

In other words *O. adelynhoserae* Hoser, 2012 is a valid species-level taxon.

In terms of the Australian species-level taxon named by Hoser (2012), Adam Britton and Graeme Webb, the two self appointed "Crocodile Kings" of the Northern Territory denounced the new Hoser-named taxon as non-existent. This was in spite of both men previously stating publicly that the Liverpool River taxon named by Hoser was a separate species to the others in the Northern Territory.

In 2012 in the tabloid media, after the publication of Hoser (2012), both men claimed that allegedly new (but unpublished) DNA evidence supported their claim that the species *Oopholis jackyhoserae* Hoser, 2012 was not genetically distinct from *O. johnsoni* Krefft, 1873.

However on ABC radio in 2014 (two years later), Britton confirmed that *Oopholis jackyhoserae* Hoser, 2012 was a genetically distinct species leading Hoser to call for an apology as reported in the media at the time and online at several sites, including (McCue 2014), published at: <http://www.ntnews.com.au/news/northern-territory/the-northern-territorys-pygmy-freshwaters-crocs-spark-big-debate/news-story/b3cf6630b3d9de0980d292b3b1b4f627>

It had been long suspected that Freshwater Crocodiles from the so-called "bird's head region" of western Irian Jaya, or West

Papua, were different again to the previously named two species of Freshwater Crocodile from New Guinea and while good DNA evidence supporting this is not yet available, the morphological divergence between the three forms is self-evident.

Furthermore the distinctiveness of these west Irian Jaya crocodiles reflects similar distinctiveness in other predominantly freshwater, river-dwelling taxa, such as Turtles in the genus *Elseya* Gray, 1867, for which parallel DNA data has been published.

#### MATERIALS, METHODS AND RESULTS

From the introduction of this paper, these are all obvious. A limited number of specimens of Freshwater Crocodiles from the Bird's Head region of New Guinea were inspected as were photographs of specimens alleged to have been taken from this area.

All were compared with other known Crocodile taxa. The differences between these specimens and other Freshwater Crocodile species were consistent enough to warrant this new taxon to be treated as full species.

Other taxa inspected included "*Crocodylus mindorensis* Schmidt, 1935" as well as all freshwater species from Australia, New Guinea and Indonesia.

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in breach of undertakings to the court (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper.

This is in view of the conservation significance attached to the formal recognition of unnamed taxa at all levels and on the basis that further delays may in fact put the presently unnamed or potentially improperly assigned taxon at greater risk of extinction.

This comment is made noting the extensive increase in human population in South-east Asia and Australia, with a conservative forecast of a four-fold increase in human population in Australia in the next 100 years (from 25 million to 100 million) and the general environmental destruction across the continent as documented by Hoser (1991), including low density areas without a large permanent human population.

For the island of Papua, the rate of population growth is greater than for Australia and therefore the damage and relative harm to the environment and indigenous species is likely to be even greater.

I also note the abysmal environmental record of various Australian National, State and Local governments in the relevant Australian region over the past 200 years as detailed by Hoser (1989, 1991, 1993 and 1996) and likewise for the governments of both PNG and Indonesia.

Literature relevant to crocodiles in New Guinea and this paper is listed by Hoser (2012) and not repeated here. The new species is named according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) and the spelling of the species name should not be altered in any way, unless totally mandatory according to the rules of the in force *International Code of Zoological Nomenclature*.

There are no conflicts of interest in relation to this paper.

#### OOPHOLIS (PHILAS) OXYI SP. NOV.

**Holotype:** A preserved specimen (skin and skull only) at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number: Herp-BPBM 5842, collected at a few km south of Oransbari, Manokwari Division, West Papua, Indonesia.

The Bernice P. Bishop Museum, Honolulu, Hawaii, USA, allows access to its holdings.

**Paratype:** A preserved specimen (skin and skull only) at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number: Herp-BPBM 3942, collected at a few km south of Oransbari, Manokwari Division, West Papua, Indonesia.

**Diagnosis:** *O. oxyi* sp. nov. is similar in most respects to *O. novaeguineae* (Schmidt, 1928) and is readily separated from *O. adelynhoserae* Hoser, 2012 as if it were *O. novaeguineae*, as outlined in Hoser (2012) and within this description, except in terms of the length of the snout.

*O. oxyi* sp. nov. is most readily separated from *O. novaeguineae* and *O. adelynhoserae* by the following suite of characters: the nostrils open vertically, as opposed to slightly forward and the inflection upwards of the upper snout past the third side tooth is significant and readily noticeable, as opposed to being slight in *O. novaeguineae* and *O. adelynhoserae*.

*O. oxyi* sp. nov. also has a shorter and broader snout than any of *O. novaeguineae*, *O. adelynhoserae* or any Australian species, noting that *O. johnsoni* Krefft, 1873 has the shortest and most blunt snout of any Australian species as outlined in Hoser (2012) and would perhaps be morphologically most similar to *O. oxyi* sp. nov. on that basis.

In *O. oxyi* sp. nov. the snout is not twice as long as wide, but in fact far shorter.

*O. oxyi* sp. nov. is also characterised by the presence of about 5-6 obvious and usually scattered white scales on the front flanks of the front limbs.

*O. adelynhoserae* Hoser, 2012 was formerly classified as a variant of *O. novaeguineae* until 2012.

It is separated from *O. novaeguineae* by 5 or 6 post-occipital scales on the neck, versus 4 (consistently) in *O. novaeguineae*.

*O. adelynhoserae* has a distinctly narrower snout than *O. novaeguineae*. *O. novaeguineae* appear to have triangular head and snout, with minimal curvature inwards at the posterior part of the snout, whereas in *O. adelynhoserae* the upper part of the snout narrows more rapidly giving the snout the appearance of being separate from the rest of the head

In both species the snout is roughly twice as long as it is wide at the base.

*O. adelynhoserae* sp. nov. nests during the wet season, whereas *O. novaeguineae* nests during the dry season. *O. adelynhoserae* sp. nov. lays fewer, larger eggs which hatch into significantly (by 5 cm) longer hatchlings on average.

The two species have quite different breeding biologies.

*O. novaeguineae* averages 35.2 eggs per clutch while *O. adelynhoserae* lays an average of 21.7 per clutch. *O. novaeguineae* typically nests on floating plant islands in overgrown canals and side-arms. By contrast *O. adelynhoserae* usually nests on land (Hall and Johnson 1987, Hollands 1987). Hatchling *O. adelynhoserae* measure 25-30 cm, versus 20-25 cm in *O. novaeguineae* and 18-20 cm in *O. johnsoni*.

*O. adelynhoserae* is the species of Freshwater Crocodile found south of the central cordillera of New Guinea, with the centre of distribution being the Fly River system and tributaries. Specimens from Port Moresby and environs formerly attributed to *O. novaeguineae* are attributable to *O. adelynhoserae*.

*O. novaeguineae* is now restricted to the river systems north of the central cordillera, with the distribution centred on the Sepik River System and tributaries.

While the species distribution boundaries for each of *O. novaeguineae* and *O. adelynhoserae* are not known, it is likely that *O. adelynhoserae* encroaches that of *O. novaeguineae* on the south-east end of Island New Guinea, based on known distributions of other species groups with north-south divisions on island New Guinea.

There have been numerous studies published on "*O. novaeguineae*". Unfortunately many of these would in fact be attributable to *O. adelynhoserae*. Herpetologists looking at studying New Guinea crocodiles in the future should be aware of the fact that previous studies did not differentiate between the various local Freshwater species.

The breeding biology of *O. oxyi* sp. nov. is not known.

**Distribution:** Restricted to the "Birds head" region of West Papua, Indonesia.

**Conservation:** Rapid population growth, degrading of aquatic ecosystems and a general fear of Crocodiles as a potential threat to human life have all combined to create a sharp decline in numbers of Freshwater Crocodiles in western New Guinea.

Very few specimens of this species have been lodged in museums anywhere and there are few if any alive and captive and being bred as a pure lineage at any recognized crocodile breeding facility.

The fact that this species does not grow as large as others does not make it a good business proposition for farming for skins and meat.

A proper study of the exact numbers, distribution and population stability of this taxon is required from which proper conservation action can be undertaken. This may include the creation of national parks and reserves in drainages holding significant populations of this taxon as well as public education of local people.

Furthermore the bringing of specimens into captivity for breeding and insurance purposes is likely to be required.

In the long term the only sustainable solution to conservation issues facing this and most other rare or threatened species is a reduction in the rate of human overpopulation globally as stated by Hoser (1991) and in the long term a general reduction.

**Etymology:** Named in honour of a now deceased Great Dane, named *Oxyuranus* (*Oxy* for short) in recognition of his services protecting our research facility from unlawful thefts and attacks and also protecting our young daughters over an eight year period. *Oxyuranus* Kinghorn, 1923 is a well-known genus of Australasian elapid snake.

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