in: Reptiles

# Ocul ude ntav is

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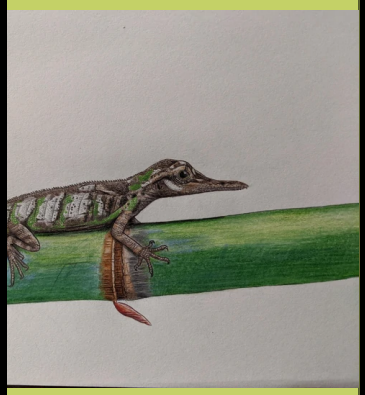
|  |
| **Statistics** |
| Eye teeth bird |
| O. khaungraae<br>O. naga |
| Asia |
| Carnivorous |

Oculudentavis is an extinct genus of uncertain squamate that lived in Myanmar during the Late Cretaceous.

## History

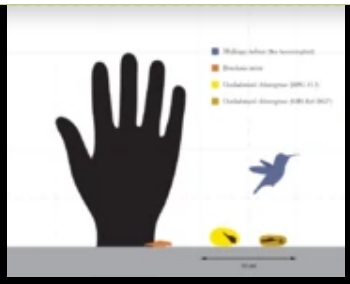
O. khaungraae is known from a complete skull from Angbamo site, Tanai Township, Kachin State, north Myanmar Burmese amber. The genus name is the combination of the Latin "oculus", "dentes" and "avus" - meaning "eye teeth bird". The scientific epithet honours the woman who donated the amber to the Hupoge Amber Museum, Khaung Ra. The specimen is catalogued as HPG-15-3. Later in 2020, specimen GRS-Ref-286278 was attributed to the genus via an unpublished preprint. In 2021, the specimen was published in Current Biology as O. naga, a new species. This represents the skull and frontal portion of the torso. The epithet "naga" refersto the Naga people who once played a prominent role in the Myanmar amber trade.

### Controversy and Criticism

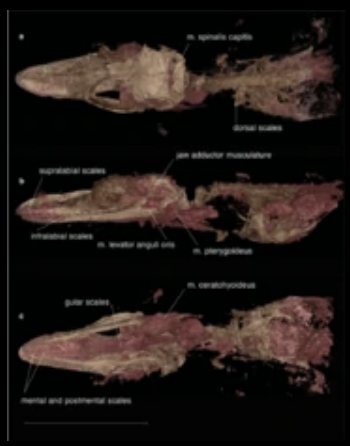
After the type species was published, it was promoted to the front page of Nature. Amidst the press, some

Burmese amber which were first observed in 2019. Among them, the miners are paid poorly, many of whom are underage. Additionally, the amber trade funds the Kachin conflict, akin to blood diamonds. The Society of Vertebrate Paleontology strongly discouraged members from collecting and studying Burmese amber due to the connection to resource and human rights abuse in April 2020.

Scientifically, some authors criticized the publication. Wang et al. found the paper to use ambiguous language - "bird-like" rather than "being a bird" and "saying there is a strong potential for new data to markedly alter [their] systematic conclusion". Wang et al. also notes their classification of Oculudetavis as an avialan was concluded based on no phylogenetic studies, their morphological description and phylogenetic placement "illogical", who state the papeer could compromise their conclusions, significance and hypotheses. The article published in Nature was retracted on July 22, 2020, which was based on O. naga (not known to be distinct then) suggesting Oculudentavis was not an avialan.



O. khaungraae and O. naga compared to Homo sapiens hand, the smallest reptile (Brookesia micra) and the smallest dinosaur (bee hummingbird)



GRS-Ref-286278, O. naga.

O. khaungraae's skull is 1.73 centimeters (0.68 inches) long, and O. naga has a skull 1.42 centimeters (0.56 inches) long. In the past, O. naga's skull was misinterpreted as 1.4 centimeters (0.55 inches) long. In life, Oculudentavis would have been similar in size to the bee hummingbird. It's snout is slender and the roof is bulbous, having 23 teeth. Oculudentavis has very large eyes fit with thick sclerotic rings formed from spoon-shaped ossicles. This indicates Oculudentavis was

out the side, as observed from a slanted jugal, meaning it did not have binocular vision. Oculudentavis may have had a strong bite and a diet specialized for small invertebrates, as it has sharp teeth, a tall coronoid process and a robust skull that is inflexible. In comparison to Mesozoic avialans, Oculudentavis presents a mosaic of plesiomorphic and advanced characteristics. Oculudentavis retains a separate frontal, parietal, postorbital and squamosal (all fused in modern birds). The extensive number of teeth is similar to non-avialan theropods. However, there is no separate antorbital fenestra and the elongate snout bones are fused. These are more common in modern birds. The acrodont or pleurodont tooth implantation and sclerotic bones, for example, are not in dinosaurs but in modern lizards. A patch of skin near the skull's base appears to be scaly, which is unusual for birds but usual for lepidosaurs. The high amount of teeth and lack of the antorbital fenestra and quadratojugal bone have been used to argue against the avialan hypothesis. Both species are distinguished based on the traits of the skull, the authors of O. naga stating it is possible for the

differences to be individual variation, deformation or maybe sexual dimorphism.

## Classification

Specializations caused by the animal's small size lead to difficulties in terms of classifying Oculudentavis. The phylogenetic analysis in the original description suggests a basal avialan, slightly closer to modern birds than Archaeopteryx. This would indicate a ghost lineage from the Late Jurassic to the Middle Cretaceous ~50 million years old. A small amount of maximum parsimony suggests Oculudentavis is an enanatiornithean, similar to other enantiornithes known in Burmese amber. After publication, many have voiced their opinion on if Oculudentavis is a dinosaur, due to the characteristics closer matching squamates than theropods. The skull shape is the largest argument for a bird affinity, but some reptiles like Meroles, Anolis, Avicranium and Teraterpeton have bird-like skull shapes convergently evolved. Further, the use of bird-focused phylogenetic analysis without considering lizards has been criticized, Editors of the Institute of Vertebrate Paleontology and Paleoanthropology Fanny

an editorial in favour of the lizard affinity. Several phylogenetic analyses for O. naga were conducted, including for both Oculudentavis specimens. Both specimens sit in Oculudentavis, and an analysis based on an amniote dataset found Oculudentavis was a squamate. Inside squamata, the usage of datasets placed it as the sister to the following taxa: dibamidae, Scandensia and mosasauria. Multi-state characteristics were treated as ordered for dibamidae, unordered for Scandensia and molecular data was removed for mosasauria.

## Paleoecology

Burmese amber is known from the Hukawng Valley, a Mesozoic-Cenozoic sedimentary basin in Kachin State, north Myanmar. The strata have folded and faulted, and the basin is considered part of the West Burma Block/Burma Terrane. This area has a debated tectonic history, and the block was a part of Gondwana during the Early Paleozoic, with the rifting time uncertain (ranging from the Devonian to the Early Cretaceous. It is disputed if the block was accreted into the Asian continental margin when the amber deposited

evidence of Gondwanan affinities, with the reported albanerpetonids found in the northern continents. A paleomagnetic reconstruction finds the Burma Terrane formed an island in the Tethys during the Middle Cretaceous about 5-10° south of the equator.

The amber provides fossil flora (mosses and bamboo-like monocots), and fauna like arthropods (pisaurid spiders, onychnophorans, dypspnoid harvestman and coccoid scale insects) and vertebrates (3D skeletons and feathers), and this Earliest Cenomanian ecosystem can be described in detail. Electrorana limoae (the oldest frog in amber), Xiaophis myanmarensi, Cretaceogekko burmae, and albanerpetonid and enantiornitheans (Elektorornis and undescribed specimens) are present. These suggest a humid, warm nd tropical forest that contained some freshwater ecosystems. Also present are ammonites and ostracods, suggesting forests producing amber lived on the shoreline of marine environments. Zircon from the formation's tuffs have been uranium-lead dated to 98.8-0.6 million years old; the Cenomanian, Earliest Late Cretaceous.

https://en.wikipedia.org/wiki/Oculudentavis

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