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# New dietary records of the Taiwan Kukrisnake, *Oligodon formosanus* (Günther, 1872), with the first report of gecko-egg-eating for the genus

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The Taiwan Kukrisnake (*Oligodon formosanus*) is a widespread colubrid snake native to eastern China and northern Vietnam (Kuntz, 1963; Zhao and Adler, 1993; Nguyen et al., 2009). This species is primarily terrestrial and inhabits a variety of disturbed and undisturbed forested habitats across its range (Pope, 1935; Karsen et al., 1998; Francis, 2021, 2024). Dietary records of *O. formosanus* in the wild primarily involve lizards and their eggs (Pope, 1935; Hwang et al., 1965; Shi and Zheng, 1985; Ota and Lin, 1994; Huang, 2004, 2026), including one instance of an adult specimen scavenging a dead agamid (*Calotes versicolor* sensu lato; Messenger, 2017). In captivity, this species has also been recorded eating the eggs of the Blue-lipped Sea Krait, *Laticauda laticaudata* (Linnaeus, 1758), as well as the eggs of chickens and quails (Toriba, 1987; A. Francis, pers. obs.).

Populations of *O. formosanus* on Orchid Island, Taiwan, have been the topic of multiple ecological investigations due to their relationship with Green Sea Turtles, *Chelonia mydas* (Huang et al., 2011). During the sea turtle breeding season, female *O. formosanus* form territories around sea turtle nests to feed on the eggs. This unique behavioural interaction gives female kukrisnakes continued access to sea turtle eggs as a food resource over several weeks and constitutes one of the first documented examples of territoriality in any snake species (Huang et al., 2011). However, when environmental and human-mediated factors caused a decline in sea turtle numbers on Orchid Island, subsequent investigations of the local *O. formosanus* population documented a shift away from the turtle egg-eating strategy in favour of a more lizard and lizard-egg dominated diet (Pike et al., 2016; Lin et al., 2023; Huang 2026). More recently, direct observations of *O. formosanus* eviscerating a terrestrial frog, *Kaloula pulchra* Gray, 1831, were documented by Bringsøe et al. (2021). This feeding strategy was only reported recently in *O. fasciolatus* (Günther, 1864) but has since been observed multiple times in at least two other species (Bringsøe et al., 2020, 2021). Herein, we report two novel dietary observations of *O. formosanus*, the first based on a direct observation, and the second based on gut contents found after dissection. A summary of all dietary records for *O. formosanus* documented in the literature is provided in Table 1.

On 29 July 2025 at 21:26 h, the first and second authors encountered an adult *O. formosanus* in the process of consuming a clutch of eggs from an unidentified gekkonid lizard. The event occurred along a large water catchment in Tai Lam County Park, Hong Kong (22.4025°N, 114.0519°E, elevation 80 m) and lasting a total of 6 min. Only 4:43 min of the event was recorded on video due to the position of the drainage hole (also commonly referred to as "weep hole") along a concrete retention wall, which required a pause in recording when the second author had to physically readjust his position to continue the observation.

The snake was first observed investigating the eggs, which had been deposited upside-down on the ceiling of the weep hole. It approached the eggs along the weep hole with its head raised and bumped them with its nose while regularly flicking its tongue. The clutch consisted of two intact eggs, and two shell fragments were also visible. The fragments were either crushed prior to the predation event or had already been consumed by the snake. At the beginning of the recording, the snake had just partially broken one of two intact eggshells and created a perforation large enough to insert its head near the opening of the egg (Fig. 1A).

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**Table 1.** Prey items in the diet of *Oligodon formosanus* based on records from the literature. Scientific names and specific prey items, along with item counts, are listed as available from the original sources. Data were either reported as observations (Obs) or from dissected specimens (Dis).

| Prey Item | Count | Event Basis | Source |
|---|---|---|---|
| *Chelonia mydas*, eggs | – | Obs | Huang, 2004[a]; Huang et al., 2011 |
| *Diploderma swinhonis* (as *Japalura swinhonis*), eggs | – | Obs | Huang, 2004 |
| *Takydromus sauteri*, eggs | – | Obs | Huang, 2004 |
| *Eutropis multicarinata* (as *Mabuya multicarinata*), eggs | – | Obs | Huang, 2004 |
| *Eutropis cumingi* (as *Mabuya cumingi*), eggs | – | Obs | Huang, 2004 |
| *Sphenomorphus incognitus*, eggs | – | Obs | Huang, 2004 |
| Reptile Eggs | – | Dis | Ota and Lin, 1994 |
| Reptile Eggs | 8 | Dis | Pope, 1935 |
| *Kaloula pulchra* | 2 | Obs | Bringsøe et al., 2021 |
| Squamata (Lizards) | – | Dis | Hwang et al., 1965 |
| *Calotes versicolor* sensu lato (as *C. versicolor*) | 1 | Obs | Messenger, 2017 |
| Squamata, lizards | 2 | Dis | Shi and Zheng, 1985 |
| *Laticauda laticaudata* | – | Obs | Toriba, 1987 |
| Rodentia, rodent fur | 1 | Dis | this study |
| Gekkonidae, gecko eggs | 4 | Obs | this study |

[a] Huang (2004) provided the mean number of sea turtle eggs consumed by *O. formosanus* on Orchid Island, Taiwan, but exact prey counts cannot be ascertained from the data presented.

It proceeded to move perpendicularly, opened its jaws around the remaining shell surface, and presumably drank or otherwise consumed some of the egg's contents. The snake continued to reposition its head around the egg for approximately 50 s by rotating counterclockwise until it could grip the shell with both its upper and lower jaws (Fig. 1B). This was followed by a repeated series of protracted movements, during which one side of the palatomaxillary arch extended forward in a left-right alternating (swinging) motion (Fig. 1C, D). These actions ceased after a series of additional head movements and tongue flicks. The snake remained motionless throughout the remainder of the observation.

There is a high probability that the eggs had been deposited by *Gekko chinensis* (Gray, 1842), which is the most frequently encountered gecko at the specific location where the event occurred. These geckos were observed on the concrete wall immediately surrounding the weep hole containing the eggs. However, this identification cannot be confirmed because at least three other geckos, *Hemidactylus bowringii* (Gray, 1845), *H. garnotii* Duméril & Bibron, 1836, *Gehyra mutilata* (Wiegmann, 1834), and possibly *H. frenatus* Duméril & Bibron, 1836, all occur in the same area, with *H. bowringii* and *H. garnotii* the next most likely candidates since they were also observed in the same general location during the night of the observation.

The third author examined a series of 22 *O. formosanus* specimens in the Field Museum, Chicago (FMNH) for stomach contents and detected the remains of rodent fur in the intestinal tract of an individual with an existing midventral incision (FMNH 256977). The specimen, an adult male with 598 mm snout–vent length and 103 mm tail length weighing 112.1 g, and was collected on Shek Kwu Chau Island, Hong Kong (22.1965°N, 113.9879°E, elevation 130 m) on 2 July 1996. The dissected intestinal contents could not be identified beyond order rank (Rodentia), and the remainder of the stomach was empty. The possibility exists that the rodent fur was ingested as part of a secondary predation event, though no other prey items were detected in the intestinal tract.

To our knowledge, these observations are the first documented cases of gecko eggs and mammalian prey in the diet of *O. formosanus*, thus representing important new prey items for this species. Reptile eggs are an important food resource for many kukrisnakes, which they consume by using their blade-like maxillary teeth to slit open the eggshell and create a perforation large enough to insert their head into the eggs to drink/swallow their contents (Minton and Anderson, 1963; Coleman et al., 1993). Occasionally, the entire egg along with the yolk and/or embryo may be consumed, since entire reptile eggshells have been found in both the faecal contents and dissected stomachs of several *Oligodon* species (Wall, 1923; Toriba, 1987; J.L. Lee, pers. obs.). We are unaware of any prior confirmed cases of gecko-egg-eating in any *Oligodon* species, even though previous authors have reported adult geckos as part of

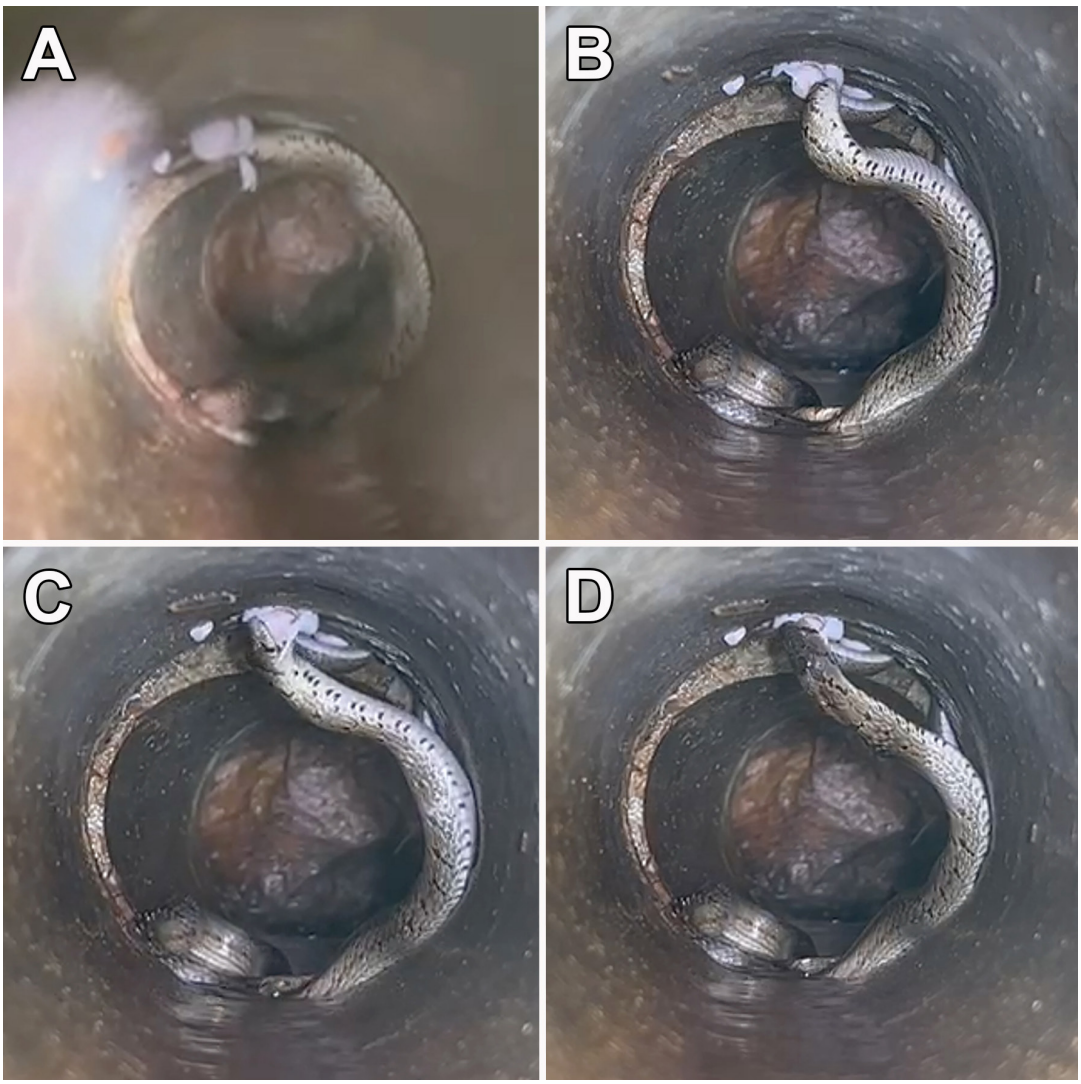


**Figure 1.** Still images of an adult *Oligodon formosanus* observed at Tai Lam County Park, Hong Kong, China, eating a clutch of gecko eggs deposited on the ceiling of a drainage hole. Images (A–D) are presented in chronological sequence. (A) Initial approach by the snake to inspect the attached gecko eggs. (B) The snake raises its head and makes contact with one of the eggshells. (C) Egg consumption begins as the snake actively attempts to swallow/crack the egg with its jaws agape. (D) The snake repositions its head as it continues to consume the egg. All videos and still images taken by Adam Francis and Benjamin W. Genter.

the kukrisnake diet (Charlton, 2018). Huang (2004) did not record gecko eggs in his study of *O. formosanus* from Orchid Island and stated that gecko eggshells were too rigid for kukrisnakes to break. Indeed, geckos tend to lay hard-shelled, spherical eggs with highly mineralised and brittle shells, whereas other squamates lay softer, leathery eggs (Kratochvíl and Frynta, 2006; Bauer, 2013). Furthermore, many gekkonids glue their eggs on structures (e.g., walls, tree trunks, logs, boulders) by applying sticky adhesives that bind the shells to these surfaces. Both features create mechanical challenges, which might explain the lack of gecko eggs in earlier dietary studies of insular *O. formosanus*. However, this remains speculative because it is equally possible that the diet of *O. formosanus* is subject to geographic or intraspecific variation. Additionally, most dietary records of *Oligodon* in the primary literature have rather coarse taxonomic descriptors (i.e., “reptile eggs”,

"lizard eggs", or "snake eggs") (Wall, 1919, 1923, 1925, 1926; Pope, 1935; Ota and Lin, 1994; Table 1), so it can be challenging to precisely identify eggs to lower taxonomic ranks unless their contents include embryonic remains with diagnostic morphological features. Subsequent trophic investigations of *O. formosanus* combining predator-prey data from stomach contents and direct observations would provide greater insights on the dietary niche breadth of this species.

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