

Oophagy in the Smooth snake *Coronella austriaca* – first photographic record of bird egg predation

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The smooth snake *Coronella austriaca* is widely distributed throughout most of Europe and in Norway it is at the northern limit of its range. The species is common and diurnal but, lives a secretive life so that there is still much to learn of its natural behaviour. The diet of *C. austriaca* consists mainly of reptiles, and small mammals are eaten by adults, whose relative abundance in the diet varies according to their availability (Goddard, 1984; Reading & Jofré, 2013). Ophiophagy has been recorded for the smooth snake (Schreitmüller, 1920; Andren & Nilson, 1979; Rugiero et al., 1995; Reading & Jofré, 2013; Strugariu et al., 2014; Groen, 2018), as well as cannibalism (Drobenkov, 2014; Jofré & Reading, 2020). In Norway, the diet of the smooth snake consists mainly of slow worms *Anguis fragilis* and shrews *Sorex* sp. (Sørensen, 2014). Common lizards *Zootoca vivipara* are eaten where they coexist with the smooth snake, but they are absent from a large parts of the smooth snake's range.

Predation of reptile eggs by *C. austriaca* is mentioned in the book by Völkl & Käsewiter (2003, page 77), and this is known from much older literature (Werner, 1897; Saint Girons, 1955; Werner, 1959; Moreira et al., 2011; Lunghi et al., 2015). Stomach contents including lizard eggs have also been observed in smooth snakes from Northern Greece in 2009 and 2014 (Pål Sørensen, pers. obs.).

Smooth snakes are known to prey upon nestling birds although there are few reports of this (Schreitmüller, 1934; NCC-REPORT 1983; Sørensen, 2014). Predation on bird eggs seems to be even rarer than predation on lizard eggs. Despite several studies of the diet of wild smooth snakes across their geographic range (Goddard, 1984; Rugiero et al., 1995; Moreira et al., 2011; Brown, Ebenezer & Symondson, 2014; Sørensen, 2014; Reading & Jofré, 2013, 2018), the remains of bird eggs in the stomachs or faeces of smooth snakes has not been documented. However, Schreitmüller (1934) reports that captive smooth snakes ate the eggs of two birds, the black redstart *Phoenicurus ochruros* and house sparrow *Passer domesticus*. There is also an old report of a smooth snake climbing a tree and feeding on the blue eggs of a song thrush *Turdus philomelos* (Zschokke, 1909/10). As the song thrush eggs were too big to be swallowed, Zschokke describes how the smooth snake moved one egg to rest on its coiled body inside the nest, and using its head the snake smashed the egg and ate the contents.

Here we present the first photographic record of a smooth

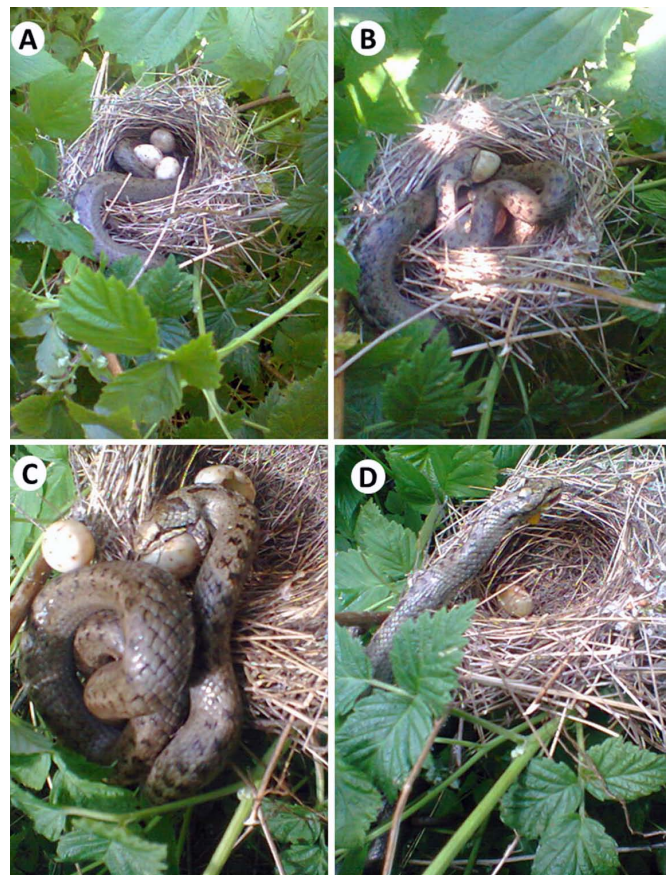


Figure 1. Smooth snake eating four eggs of a garden warbler in a nest in Norway, 2015 (photos A to D are in time sequence). The snake took 45 minutes to consume these eggs but had eaten an unknown number of eggs before the arrival of the photographer.

snake predated bird eggs in southern Norway, along the west side of the Oslo fiord, in Sekkekilen, Trosbyfjorden, Bamble commune in Vestfold & Telemark county (58° 56'12.7" N 9° 35'14.3" E).

On 5th June 2015, the second author went for a walk when the sun was shining. Suddenly he heard the alarm call of a small bird. He moved towards the call that came from some dense bushes and once in the bushes he observed a bird's nest with a smooth snake in it about one meter above ground (Fig. 1). The snake did not move away, but continued to feed on the eggs, which probably belonged to a garden

warbler *Sylvia borin*. Photographs of the snake were taken using a cell phone camera. The smooth snake had a firm grip under the nest with the rear half of its body, which made it capable of moving its upper half and head on and inside the nest. The smooth snake took one egg carefully into its mouth and swallowed it without lifting its head. Each egg took several minutes to eat, and the snake made some bending and curling movements of its body after each egg. The photos show that at least one egg was broken in the nest, and that the snake ate its contents. The observation of egg predation lasted 45 minutes (10:16 h -11:01 h). However, it is not known when the smooth snake began eating, or how many eggs there were in the nest from the start. However, 4-6 eggs are normal for garden warblers. When the last egg was eaten, the smooth snake disappeared quickly. It is possible that predation by smooth snakes on bird egg is more common than previously thought; future dietary analysis will add to our knowledge of this.

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