

NOTES

ATTEMPTED PREDATION ON CHICKS OF THE THREATENED GREEN-CHEEKED AMAZON PARROT BY AN INDIGO SNAKE

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Observations of predation by snakes, in nature, are reported infrequently and their implications are rarely explored. In this note, we report an instance of attempted predation (interrupted by an observer), by the indigo snake (*Drymarchon corais*) on chicks of the Green-cheeked Amazon Parrot (*Amazona viridigenalis*), and comment on the implications of snake predation on parrot populations in disturbed habitats.

Indigo snakes are euryphagic, preying on small mammals, birds, frogs, fish, lizards, snakes, turtles (Wright and Wright, 1957), and turtle eggs (Babis, 1949). An active, diurnal forager, the indigo snake occasionally climbs into trees or bushes, making it a potentially formidable predator of the threatened endemic and secondary cavity nesting Green-Cheeked Amazon Parrot of Northeastern Mexico.

The incident took place at Los Colorados (LC), a private ranch located at 97° 50'-22° 53', Tamaulipas, Mexico. The vegetation consists of tropical subdeciduous forest of the Veracruzian biotic province. LC is a cattle ranch, 84% of which has been selectively cleared. The remainder of clearing are tame pastures with scattered large trees (dbh > 50 cm) at a density of ca. 25 trees/ha. Conse-

quently, parrots are utilizing a mosaic of different vegetation types for breeding purposes.

During a study on the nesting phenology of three sympatric species of parrots (*A. viridigenalis*, *A. autumnalis* and *A. oratrix*) at LC, LC-L witnessed an attempted predation of two *A. viridigenalis* chicks, in an ebony tree (*Pithecellobium ebano*) cavity located ca. 7.3 m off the ground. The nest originally contained four chicks, however, prior to the predation attempt, two of the chicks were found dead with mechanical injuries and removed from the nest. On 29 June 1992, from 16:50 hr to 19:25 hr, the snake climbed the tree, entering the nest cavity. The chicks began giving distress calls and continued to do so intermittently during the remainder of the incident. LC-L observed the snake in the nest cavity for two and half hours, at which time it was removed by ECE-H. The indigo snake (ca. 178 cm total length) had one of the chicks in its mouth, which it released as the snake was pulled from the nest. The chick suffered lacerations to its thorax and part of the uropygium, and died several hours later (Fig. 1). The second chick sustained damage to its right wing, causing some edema (Fig. 1). This chick was

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Fig. 1. The result of a predation attempt by an indigo snake on two Green-Cheeked Amazon Parrot chicks: the chick on the left subsequently died from wounds to its thorax and part of the uropygium; the remaining chick suffered a damaged wing preventing successful fledging 18 days after the incident.

removed for observation and treatment and returned to the nest before dawn. Upon fledgling from the nest 18 days later, it was unable to fly and was taken into captivity. Therefore, in this instance where predation was interrupted, the net result was still the loss of both remaining chicks. In a separate incident, a field assistant observed an adult *D. corais* climb a coma tree (*Bumelia celastina*), known to have been used for nesting by *A. viridigenalis* earlier in the season, and probe several cavities, presumably in search of nestlings.

A recent study on gopher snake (*Pituophis catenifer*) attraction to bird nests (Eichholz and Koenig, 1992) concluded the following: (1) snakes were preferentially attracted to trees containing active nests; (2) cavity and open nests are both at risk to predation; (3) attractiveness to nests increases with nestling age (See also Hensley and Smith, 1986). Due to the strong reliance of many snakes on chemoreception as a cue in prey detection (Halpern, 1992), it is suspected that odors generated by the

birds, especially through the accumulation of fecal material, may provide the greatest clue to a nests' presence (Eichholz and Koenig, 1992). This lends evidence to the effectiveness of snakes as locators of active bird nests. In the case of *D. corais*, odoriferous cues may be especially important for the location of parrot chicks in nest cavities where a visual stimulus is lacking. However, this has yet to be tested.

In certain situations snakes have been reported to have major effects on avian populations. Several bird species on Guam are extinct because of the introduced brown tree snake (*Boiga irregularis*), while others have declined dramatically (Savidge, 1987). In the case of parrots, evidence is accumulating on the importance of snake predation (e.g. Snyder et al., 1987; Gnam, 1990; Silvius, 1991; Cruz and Gruber, 1981). Silvius (1991) reported a number of instances of predation on nesting parrots (adults and chicks) by snakes on the island of Margarita (Venezuela); also reporting snake density as "extraordinarily high". At LC, where the habitat is patchy, and suitable nesting trees are less common, snake predation of nestling birds may be higher than would be expected. Where threatened species are involved, this could have important management implications. In situations where parrot numbers are low and intensive in situ management is initiated, rather than predator control, we advocate a program of predator exclusion. Where snakes are major predators of birds, they may be excluded from a tree via sheet metal, netting, or chemical deterrents, although the latter two may be considered less desirable. Eichholz and Keening (1992) discuss the use of netting as an exclusionary device for snakes, although this is more suited for ex-

perimental situations as the netting has to be monitored regularly to prevent the death of entangled animals.

Acknowledgements

We thank the Clynes family for permission to conduct field work on their ranch (Los Colorados), and Mario Chavez for observational data. Financial support for the ongoing investigations on parrots in Northeast Mexico was provided to ECE-H by the World Wildlife Fund-US. ECE-H is grateful to volunteers from Wildlife Research Expeditions of the Dallas Zoological Society and PROFAUNA, A.C.; The Center for the Study of Tropical Birds, Inc.; Universidad Autonoma de Tamaulipas; Secretaria de Desarrollo Social (SEDESOL); and the Texas Agricultural Experiment Station for field and logistical help extended to him during his field work in Mexico. We thank Kelly Hogan for criticisms of an earlier draft of this paper.

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要 約

インディゴヘビに襲われたメキシコアカボウシインコの雛

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メキシコ、タマウリパス州のロスコロダスで、黒たん材の木の樹洞に作られたメキシコアカボウシインコの巣がインディゴヘビに襲われているのを見つけ、捕食されつつある雛を保護した。ここは営巣できる木が多くはなく、ヘビが雛を捕食する頻度は高いと思われる。このインコは絶滅のおそれのある種であり、このような場合はヘビを木に登らせないような対策が必要だろう。

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