

**Observations at a King Vulture (*Sarcorampus papa*) Nest in Venezuela**

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Very few observations of King Vulture (*Sarcorampus papa*) reproduction in natural conditions have been recorded. Smith (1970) found two nests in Panama; one was in a rotted stump 0.3 m above the ground

where an adult incubated 1 egg, and the other was on the ground near the base of a spiny palm and contained 1 egg. Ruschi (1979) described a nest on the ground with 2 eggs. Penard (*in Wetmore 1965*)

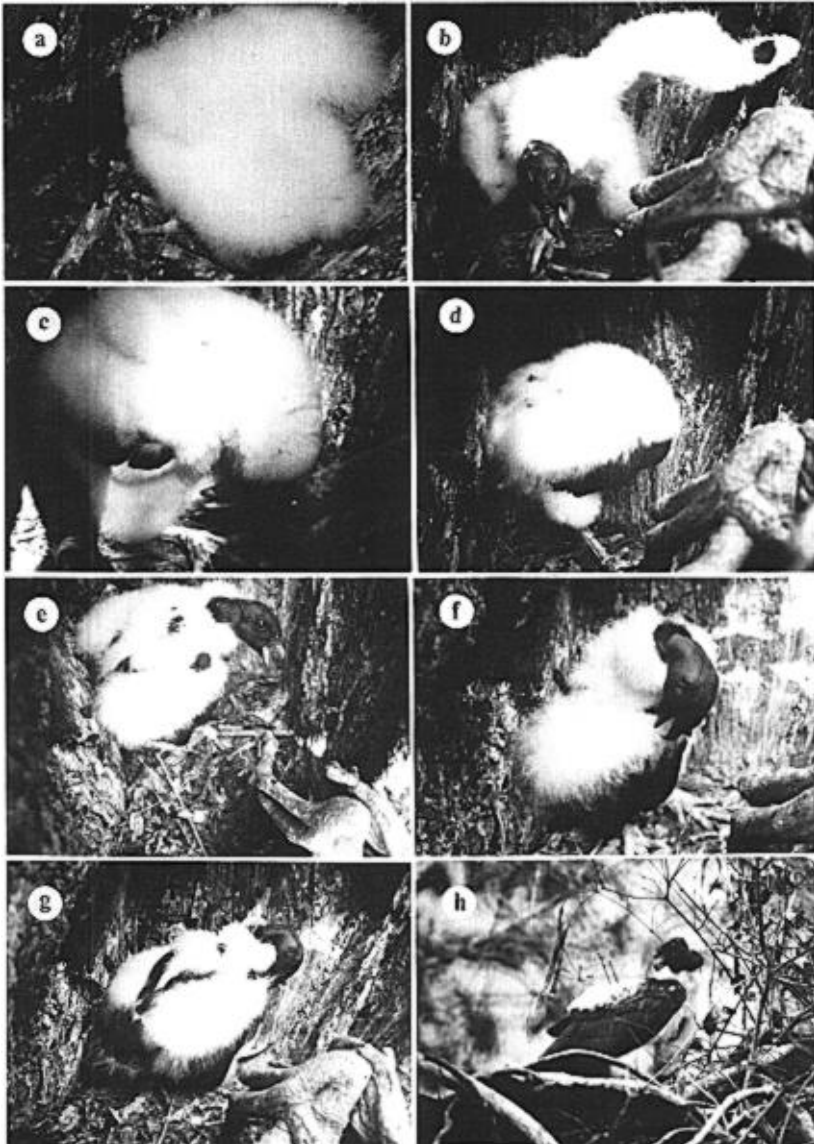


Fig. 1. Nestling appearance during successive visits to the nest. (a) 13 February 1985, first visit; (b) 8 March, day 23 after first visit; (c) 15 March, day 30; (d) 29 March, day 44; (e, f) 8 April, day 54; (g) 16 April, day 62; (h) 26 April, day 72.

stated that King Vulture nests are found in a hollow tree or rock fissure and that 1 egg is laid. In Panama Lundy (1957) found a young bird incapable of flight, possibly having fallen from a hole in a tree, and Wetmore (1965) saw a juvenile perched in a large tree.

On 13 February 1985 we found a King Vulture nest in the Andean piedmont near the town Tucupido (Portuguesa State), Venezuela. The vegetation of the area is dry tropical forest. The nest was in a hole in the limb of a saman tree (*Pithecolobium saman*) 10.5 m above the ground. The hole was 1.2 m high and 60 cm wide. A nestling inside was covered with white down and had a naked, black head (Fig. 1a). We made ten more visits at intervals of 7–10 days and recorded the appearance of the nestling, its behavior, and the behavior of the adults when present.

Incubation time for King Vultures in captivity is 56–58 days (Brown and Amadon 1968). The egg probably was laid around the end of November or the beginning of December. This corresponds to the end of the rains and beginning of the dry season.

We believe the nestling was 2–3 weeks old at our first visit. Its condition was comparable to stage 1 of the California Condor (*Gymnogyps californianus*) described by Nice (in Brown and Amadon 1968). Its appearance did not change until 8 March (day 23) when black primary and secondary pinfeathers were present on the wings (Fig. 1b). A slight growth of the nasal excrescence was also observed. On the seventh visit (29 March, day 44) black teleoptiles were present on the back and shoulders (Fig. 1d). At the eighth visit (8 April, day 54) we noted a collar of black feathers on the neck, two tracks of black feathers on the back where the wings meet the body, and black rectrices 10 cm long. All the primaries and secondaries of the wings were growing (Fig. 1e). At the ninth visit (16 April, day 62) only two tracts of down were found on the back. The breast, abdomen, and wings were still covered with down (Fig. 1g). Due to a fire, the trunk of the tree was burning at its hollow base, and a burnt branch near the nest had fallen. Never-

theless, the nestling stayed in the nest unharmed. At the tenth visit (26 April, day 72) the young bird was found outside the nest perched on a branch. Its back was almost completely covered with feathers, while the breast and abdomen retained white down. It was probably capable of flight (Fig. 1h). By the last visit on 1 May the tree had fallen, and there was no sign of the young bird.

When observers were present, the nestling vocalized continuously while bowing. The head and neck approached its feet (Fig. 1c, d). When an attempt was made to touch the nestling, it attacked, using its talons and bill. This behavior was observed during the first 7 visits. From mid-April on the nestling no longer lowered its head and neck toward its feet, but remained erect with its head and neck folded onto its breast (Fig. 1f, g). This behavior also was seen when the bird was outside the nest.

Adults were seen during only 3 of the 11 visits to the nest. On one occasion 3 adults perched in the nest tree. One left, and the remaining two went nervously from one branch to another as the observer climbed to the nest. On another occasion an adult perched about 8 m from the nest. The third time 2 adults circled overhead and landed in nearby trees.

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#### Estimating Female Settlement from Nesting Data

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Testing predictions of mate-choice models often requires knowing the time a female settles in a particular territory. Because the effort necessary to observe settlement usually precludes direct observation of a large sample of females, researchers often rely on indices of settlement such as the onset of egg laying or nest building (e.g. Crawford 1977, Orians 1980, Yasukawa 1981, Yasukawa and Searcy 1981, Roskaft and Jarvi 1983, Alatalo et al. 1984, Muldal et al.

1985, Leonard and Picman 1986, Wooten et al. 1986, Lightbody and Weatherhead in press). Obviously, the reliability of those indices are of critical importance. We report on two studies that assessed the reliability of indices of female settlement. We also attempt to determine the factors that influence reliability in our own and in previously published studies to provide guidelines for future studies that use such indices.

The time from settlement on a territory to clutch