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ABNORMALLY LONG BILL IN A YOUNG CURVE-BILLED THRASHER

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Abstract.—We report an approximately 40-d-old male Curve-billed Thrasher, *Toxostoma curvirostre,* with a bill more than three times normal adult length. Its excessive bill length was caused by growth of the rhamphotheca and not the bones underneath it. This is the largest proportional increase in bill growth rate due to a pathological condition yet documented.

PICO ANORMALMENTE LARGO EN INDIVIDUO DE *TOXOSTOMA CURVIROSTRE*

Sinopsis.—Informamos en un individuo de *Toxostoma curvirostre* de aproximadamente 40 días de edad, un pico tres veces más largo que el de un ave adulta. Este tamaño anormal del pico fue causado por el crecimiento de la ramfoteca y no del hueso bajo ésta. Este es el aumento proporcional más grande que se ha documentado en el crecimiento de un pico, causado por una condición patológica.

On 27 September 1989, a juvenile male Curve-billed Thrasher, *Toxostoma curvirostre,* with a severely deformed bill was found freshly dead in a suburban yard in Tempe, Arizona, U.S.A. The maxilla and mandible were strongly decurved to the right and left respectively, and were completely nonoverlapping for most of their lengths (Fig. 1a). The maxilla measured 107.0 mm along the curvature of the culmen from the base of the forehead to the tip of the maxilla. The mandible measured 62.5 mm along its curvature from the gonys to the tip of the mandible. Using the methods described above, we measured the maxilla and mandible lengths of 15 normal adult male *T. curvirostre* specimens from central Arizona in the ornithology collection at the University of Arizona. Maxilla and mandible lengths (mean ± SD) were 32.97 ± 1.49 mm and 20.75 ± 1.45 mm, respectively. We could not detect any other abnormalities in external or internal morphology. However, the specimen was heavily infested with feather lice. Heavy ectoparasite loads have been frequently reported in birds with deformed bills, presumably because of difficulty preening (e.g., Barlow 1967, Kennedy 1969, Pomeroy 1962).

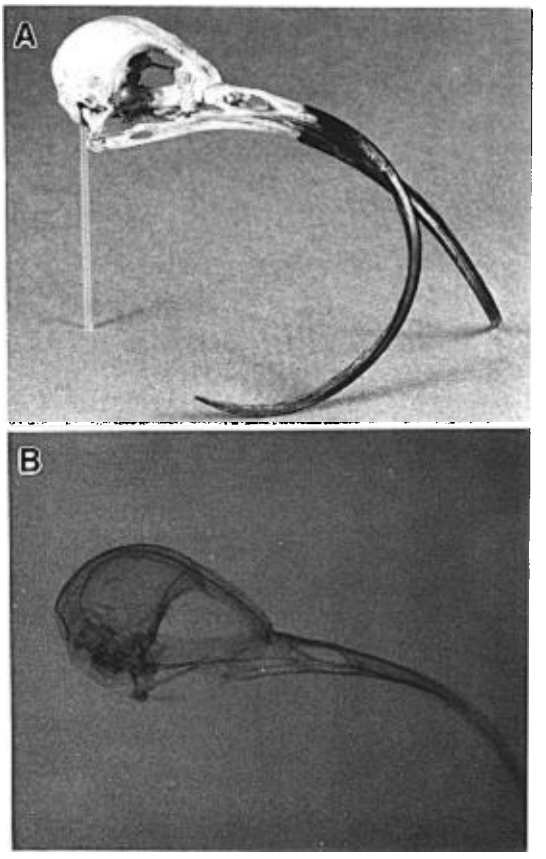

FIGURE 1. (A) Dorsolateral view of skull of juvenile male Curve-billed Thrasher, *Toxostoma curvirostre,* with abnormally long decurved and crossed maxilla and mandible. (B) Lateral view of high resolution (unscreened) mammography x-ray of same skull. The skull was deposited in the ornithology collection of Arizona State University.

The specimen was a juvenile based on several criteria: 1) its skull had not yet begun to ossify, 2) all remiges and rectrices were sheathed and incompletely grown, 3) its iris color was gray, 4) the tips of its outer rectrices were buff colored, and 5) down feathers were present on its head (Pyle et al. 1987, Walters and Lamm 1986). The specimen was a male with testes less than 1 mm in diameter.

We estimate that this specimen was 35–45 d old based on several lines of evidence. In a study of the ontogeny of *T. curvirostre,* Rand (1941) states that on the thirty-fifth day after hatching "the tail is almost three-quarters grown" and by the forty-fifth day "the tail is full length." The specimen's middle pair of rectrices were 112 mm long or about 93% full grown (Walters and Lamm 1986). Assuming a linear rate of rectrix

growth, this suggests that the specimen was about 42 d old. Rand (1941) also states that by the forty-fifth day juveniles "appear similar to the adult except for the pale grayish-white eye." The iris of our specimen was smoke-gray (color 45, Smithe 1975). This color precedes the grayish-white color mentioned by Rand (1941)(Walters and Lamm 1986). This also suggests that the specimen was less than 45 d old. Nestling *T. curvirostre* fledge 14–18 d after hatching and continue to be fed by their parents until 30–40 d after hatching (Rand 1941). If the specimen were unable to feed itself as we believe (see below), then it could not have survived much beyond 30–40 d of age.

Many birds with less deformed bills, including one report of a Brown Thrasher, *T. rufum* (Brown 1976), manage to survive and reproduce by behaviorally adapting to their handicap (e.g., Fox 1952, King and Rolls 1968, Pomeroy 1962, Thorpe 1956). However, this specimen clearly starved to death probably shortly after becoming independent from its parents. Adult male *T. curvirostre* weigh 80.9 ± 5.0 g (mean ± SD)(Walters and Lamm 1986), but the specimen weighed only 55.7 g, had extremely emaciated pectoral muscles, no subcutaneous fat, and no discernible food in its alimentary canal.

Lateral x-rays of the skull using high resolution (i.e., unscreened) mammography film clearly illustrated that the abnormal bill elongation was caused by excessive growth of the rhamphotheca and underlying dermotheca. The bones underlying the rhamphotheca appeared normal in length and structure (Fig. 1b), which agrees with previous reports of birds with abnormally long bills. In all such cases reported in which the underlying bones were examined by dissection or x-ray, they appeared normal and the abnormal bill elongation was due to excessive growth of the rhamphotheca and dermotheca (Barlow 1967, Carothers and Balda 1970, Easterla 1972, Easterla and Todd 1971, Fox 1952, Harris 1962, Taylor and Anderson 1972).

The causes and occurrences of bill abnormalities were reviewed by Pomeroy (1962), and hundreds of additional cases of bill abnormalities have been published subsequently. This is the first record of an abnormal bill in *T. curvirostre*, but similar cases of abnormally long bills have been reported in Brown Thrashers (Brown 1976, Goertz and Mowbray 1969, Mason 1962, Post 1985, Prescott 1968, Steffee 1968, Stitt 1968, Taylor 1973) and California Thrashers, *T. redivivum* (Fox 1952), as well as many other mimids (e.g., Allard 1930, Arendt and Arendt 1986).

Abnormal elongation of the bill may be genetic (e.g., mutations caused by environmental teratogens [Gochfeld 1975]) or developmental in origin. Developmental elongation may result from disease, injury, malocclusion of the maxilla and mandible, or environmental induction (Pomeroy 1962, West 1959). The specimen did not exhibit any sign of disease or injury to the bill. In addition, disease or injury was unlikely to cause proportional increases in growth of both the maxilla and mandible as exhibited by this specimen and, therefore, probably did not cause the excessive bill growth in this specimen.

Bill length in juveniles reaches that of adults several weeks after fledging when bill growth is completed (Walters and Lamm 1986). The growth of this specimen's maxilla and mandible to greater than three times normal adult length within 3–4 wk after fledging represents at least a threefold increase in growth rate over normal and is the greatest proportional increase in bill growth rate due to a pathological condition yet documented.

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