

# Weevil (*Strangaliodes* sp., Curculionidae) Records for the Early Holocene in the Semiarid North of Chile

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Studies of fossil insects in Chile are circumscribed to records of the south part of the country (40–45° S), and essentially include coleoptera and cephalic capsules of *diptera chironomidae* (Ashworth and Hoganson 1987; Ashworth and Marckgraf 1989; Ashworth et al., 1991; Borrero et al. 1991; Massafiero and Brooks 2002; Saxon 1979). On the other hand, the only archaeological site in the south of America with well-documented records of insects is Monte Verde, which includes predominantly coleoptera, among which weevils stand out (Curculionidae) (Ashworth et al. 1989).

In this context, the reevaluation of samples from an early archaeological site known as Punta Ñagué, an early-Holocene hunter-gatherer-fisher habitation site located along the coast of Los Vilos (31°) in the semiarid north of Chile, has recovered one elytron of a weevil (Figure 1A) of the genus *Strangaliodes*.

The remains of this insect were recovered along with other organic remains in a soil sample (3 liters) processed by flotation (light fraction), which was obtained from the lower levels (105–110 cm) of the archaeological deposit, formed by a sand matrix of a paleo-sand dune with mollusk remains and other cultural signs dated to **c. 12,000–10,000 CALYBP (Beta 94101: 9320 ± 60 RCYBP [10,439 CALYBP] / Beta 106802: 10,200 ± 70 RCYBP [11,895 CALYBP])** (Jackson and Méndez 2005). The remains of the insect were probably deposited at some point in the abandonment of the settlement, which was repeatedly occupied.

The specimen consists of a right elytron that is morphologically assignable to the genus *Strangaliodes*, by displaying a soft and constant convexity in the elytral declivity and a back of longitudinal convexity, which are typical features of this genus of weevil (Elgueta 1985). The elytron is 8.10 mm long and dull black in color; the striae puncture is deep without scales (Figure 1B). The darkening of the structural color (Elias 1994), the detachment of the scales from the striae, and the stratigraphic position and radiocarbon dating of the layer where this elytron was recorded confirm that it was deposited during the early Holocene.

However, taphonomic samplings from present-day dune systems in the same locality have led to recovery of 128 remains of this weevil. This record confirms that the elytra are the best preserved parts (23.44%), being considerably unaffected by meteorization processes owing to their rigid and highly sclerotized structure.

The genus *Strangaliodes* is endemic (or native) to Chile and at present

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consists of nine species (Elgueta and Marvaldi 2006), four of which live in the hyperarid north extreme of the country (15°–25°), while *S. niger*, *S. sticticus*, and *S. sulcatulus* live in the central valley (35° S), and *S. albosquamosus* and *S. mutuarius* are found in the Andean foothills of the south-center of Chile (35° S). Although the elytron reported here belongs to the genus *Strangaliodes*, it is not assignable to any of the above-mentioned species, and instead corresponds to a new species not yet described. The study of its ecology shows that it is nowadays restricted to dunes, where it is associated with *Baccharis* sp. (Asteraceae), where it develops its larval state.

The record of this species of *Strangaliodes* in early-Holocene archaeological deposits is concurrent with Asteraceae predominance (*Baccharis* sp.) for this period (Maldonado et al. 2010; Maldonado and Villagrán 2006a, 2006b), when environmental conditions were relatively dry. This suggests that this species of weevil once enjoyed a wider dispersion, owing to the predominance of Asteraceae in this period and to the strict development of this weevil in this kind of plant (monophagous).

This type of record could yield relevant insights into the environment of archaeological sites, because one of the most important features of insects is their sensitivity to environmental change (Elias 1994). At the same time, the record of old insects contributes to the paleogeographical knowledge of the biological diversity of the environments occupied by the first human populations that inhabited the continent.

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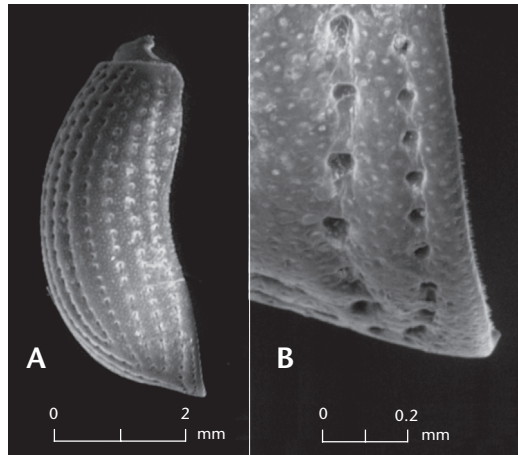
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**Figure 1.** Scanning electron microphotograph of elytron *Strangaliodes* sp. (Curculionidae):

**A**, showing the longitudinal striae and interstriae; **B**, elytron apex, showing the absence of scales on puncture.

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