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First description of the deutonymphal stage of *Laelaps mazzai* (Mesostigmata: Laelapidae)

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Mites of the genus *Laelaps* Koch, 1836 (Mesostigmata: Laelapidae) are distributed worldwide and are common ectoparasites of small mammals (Dowling 2006). About 30 species of *Laelaps* have been reported from South America, 10 of which are associated with Sigmodontinae rodents (Cricetidae) from Argentina (Gettinger 1992; Lareschi and González-Acuña 2010; Lareschi and Mauri 1998; Lareschi *et al.* 2006; Savchenko and Lareschi 2019, 2022). Most *Laelaps* species have been described exclusively on the basis of females, while males and immatures are known for only a few species. *Laelaps mazzai* Fonseca, 1939, has been described mainly in association with several species of sigmodontine rodents of the genus *Calomys* Waterhouse, 1837 (e.g. Furman 1972a; Lareschi and Mauri 1998). This mite was described on the basis of one female and three males collected from a "wild rat" captured at an unidentified site in Salta Province, Argentina (Fonseca 1939). Furman (1971) selected a lectotype based on a female specimen and an allotype for the species and provided a new set of diagnostic characters. Until now, the immature stages of *L. mazzai* are unknown. Therefore, the aim of our study was to provide the first morphological description of the deutonymph of the species.

Mites were collected from four rodents, identified on the basis of genetic evidence as *Calomys fecundus* (Thomas, 1926), captured on 16 August 2019 in a meadow surrounded by Copernicia palms at 32 km SW La Unión, Salta Province, Argentina (24° 2′ 43.5″ S, 63° 28′ 12.0″ W, 235 m). Mites were preserved in 96% alcohol, cleared in lactophenol and mounted individually in Hoyer's medium (Walter and Krantz 2009) to be identified using a light microscope. Identification of females and males was based on the original description and illustrations in Fonseca (1939) as well as Furman (1972a, 1971) and Tipton (1960) and comparison with the lectotype (IBSP604c) and allotype (IBSP6042/3) of *L. mazzai* (Coleção Acarológica do Instituto Butantan, SP, Brazil). Evans and Till (1965, 1979) were followed for chaetotaxy and shields nomenclature of the mites. Measurements were taken using Leica Application Suite software (V.4.12), provided in micrometers (µm). The results were presented as the average measurement followed by minimum and maximum values between brackets. Voucher mites will be deposited at División Zoología de Invertebrados, Museo de La Plata (MLP, La Plata, Buenos Aires, Argentina), at the moment field number is provided for each mite. Pardiñas *et al.* (2017) was followed in the taxonomy of the rodents. Vouchers of host *Calomys*

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are housed at the Colección de Mamíferos del Centro Nacional Patagónico (CNP, Puerto Madryn, Chubut, Argentina), while others maintain the field number.

Ninety mites were collected from the four *C. fecundus* examined. Out of them, 64 were females, 15 males, and 12 deutonymphs. Protonymphs and larvae were not collected. All mites were identified as *L. mazzai.*

Description of the deutonymph of Laelaps mazzai *(Figs. 1–3)*

Specimens studied – 12 deutonymphs (CNP6806-12, CG1021-3, CG1021-7, CG1028-2, CG1028-3, CG1028-4, CG1028-5, CG1031-2, CG1031-3, CG1031-4, CG1031-5, CG1031-6).

Dorsum (Fig. 1a) – Dorsal shield less sclerotized than females and males. Chaetotaxy similar to adults, with setae more numerous principally at the anterior third of the dorsal shield, gathered in three groups, one in the middle and two laterals. Dorsal shield reticulated, covering almost the 90% of the idiosoma, about 1.5 longer (532 [527–539]) than wide (338 [319–347]), with undulated anterior margins, corresponding to the widening of the shoulders of the idiosoma; lateral margins with well-developed lateral incisions at the level of connection of the podonotal and opisthonotal shields. Posterior lateral margins converging with the almost straight posterior margin of the dorsal shield.

Venter (Fig. 1b) – Reticulated sternogenital shield 295 [286–305] in length; with anterior margin rounded, four pairs of setae present, with the third pair longer (st.3 = 89 [80–95]) than the first (st.1 = 61 [56–66]), second (st.2 = 83 [75–88]), and the fourth pair (st.4. = 77 [75–81]). Posterior margin of the sternogenital shield convex. Well-developed peritremes, peritrematic shield well sclerotized, not extending posterior to stigma, terminating at the level of the lateral margin of the coxae II. Chaetotaxy in opisthogaster and anal shield similar to that the females and males, with about 25 pair of setae.

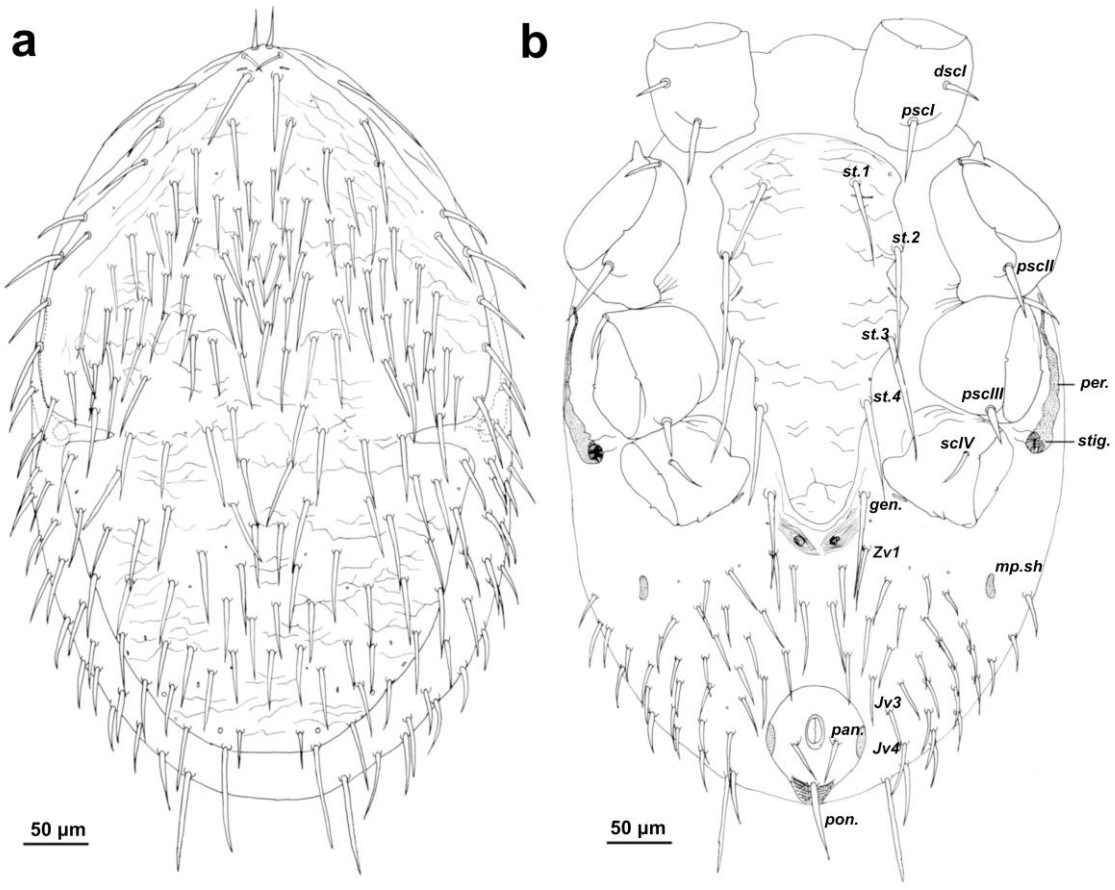

Figure 1. *Laelaps mazzai* (deutonymph) – **a.** Dorsal view of idiosoma; **b.** Ventral view of idiosoma. dscI = distal setae of coxae I, mp.sh = metapodal shields, pan. = paranal setae, per. = peritreme, pon. = posterior anal seta, pscI = proximal

setae of coxae I, pscII = posterior setae of coxa II, pscIII = posterior setae of coxae III, scIV = setae of coxae IV, st.1 = sternal setae 1, st.2 = sternal setae 2, st.3 = sternal setae 3, st.4 = sternal setae 4, stig. = stigma.

Gnathosoma (Figs. 2a, b) – Gnathosoma as in females. Hypognathal groove (hyg.gr) with six rows of hypognathal denticles (hyg.dent.), tristosternum (tr.) very transparent and hardly visible. Posterior hypostomal seta (hyp.3 = 25 [22–27]) and palpcoxal seta (pcx.s. = 25 [24–26]) of similar lenght. Pilus dentilis (p.d. = 11 [10–12]) setiform.

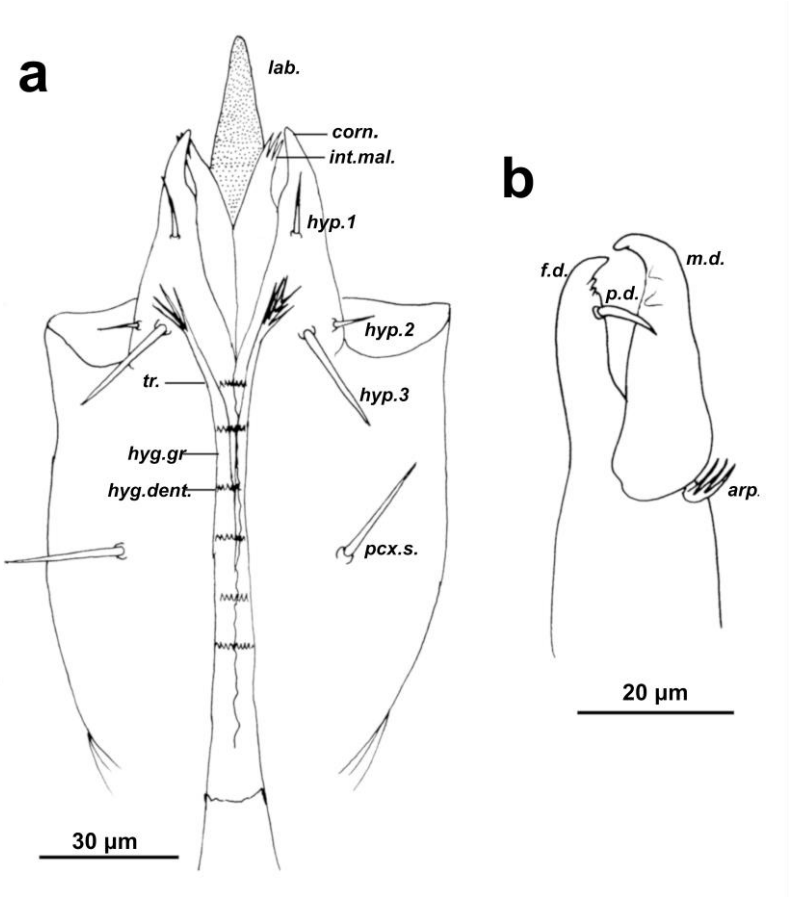

Figure 2. *Laelaps mazzai* (deutonymph) – **a.** Gnathosoma (chelicerae excluded); **b.** Chelicera. arp. = artrodial processes, corn. = corniculi, f.d.= fixed digit, hyg.dent. = hypognathal denticles, hyg.gr = hypognathal groove, hyp.1 = anterior hypostomatic setae, hyp.2 = external posterior hypostomatic setae, hyp.3 = internal posterior hypostomatic setae, int.mal. = internal mala, lab. = labrum, m.d. = movable digit, pcx.s. = palpcoxal setae, p.d. = pilus dentilis, tr. = tritosternum.

Legs (Figs. 1b, 3) – Chaetotaxy of the legs similar as in females and males, with proximal (pscI = 45 [43–48]) and distal (dscI = 25 [23–26]) setae of coxa I, posterior seta of coxa II (pscII = 39 [39–40]), and seta of coxa IV (scIV = 26 [25–27]) all of them setiform. Posterior seta of coxa III spiniform (pscIII = 26 [25–27]). Femur I (FI) with one long dorsoapical seta (66 [63–69]) and Genu I (GI) with two prominent dorsoproximal setae (77 [70–85] and 41 [40–42]).

Within *Laelaps*, out of about 30 species known, only the deutonymphs of the following species were previously described: *Laelaps agilis* Koch, 1836, *Laelaps echidnina* (Berlese, 1887), *Laelaps flexa* Furman, 1972, *Laelaps galliarii* Savchenko & Lareschi, 2022, *Laelaps horaki* Matthee & Ueckermann, 2009, *Laelaps nuttalli* Hirst, 1915 (Hirst 1914; Furman 1972b; Edler and Solomon 1979; Savchenko and Lareschi 2022). The deutonymph of *L. mazzai* described here differs from the others already described by the dorsal chaetotaxy. The hypertrichous state and the arrangement of setae in the dorsal shield, as well as the chaetotaxy of the coxae are identical to those in the females

and males of *L. mazzai*. These features also distinguish *L. mazzai* from the other hypertrichous species, such as *Laelaps navasi* Fonseca, 1939, *Laelaps surcomata* Furman, 1972, and *Laelaps valdevinoi* Gettinger, 1992. The results presented here contribute to the knowledge of laelapids from the Neotropics.

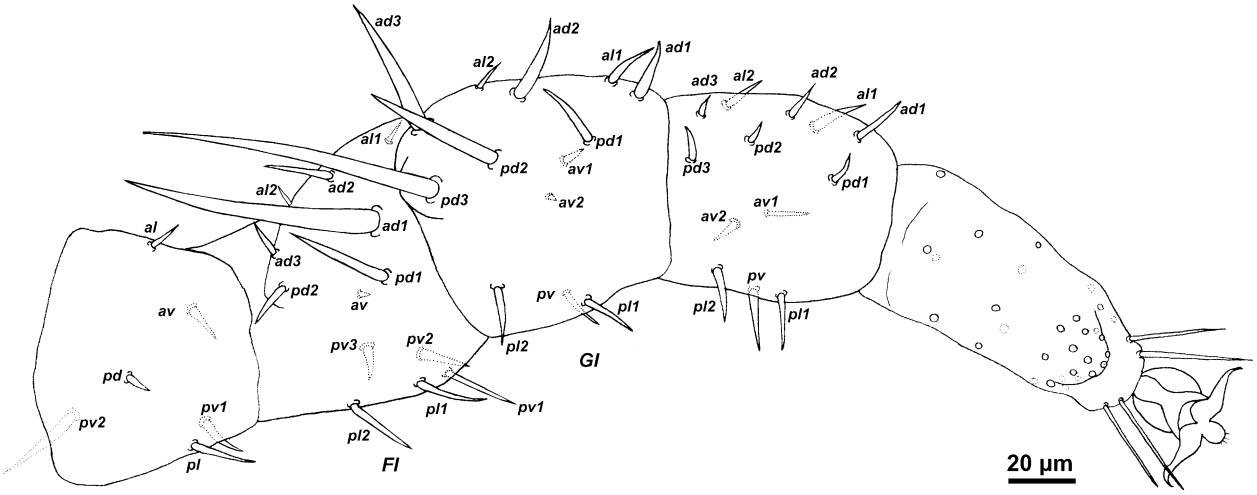

Figure 3. *Laelaps mazzai* (deutonymph) – Leg I. FI = femur I, GI = genu I.

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