

Description of Immature Stages and Male of *Cosmolaelaps keni* (Laelapidae)A. K. Nasr<sup>\*</sup>; S. A. El-Sawi<sup>\*</sup>; S. M. O. El-Bishlawy<sup>\*\*</sup> and M. L. Abd-Elwahab<sup>\*</sup><sup>\*</sup>Pests and Plant Protection Dept., National Research Centre, Dokki, Cairo, Egypt.<sup>\*\*</sup>Zoology and Agric. Nematology Dept., Fac. of Agric., Cairo Univ., Cairo, Egypt.

## ABSTRACT

Immature stages and male of the laelapid mite, *Cosmolaelaps keni* Hafez, El-Badry and Nasr, are described and illustrated.**Key words:** Acari; *Cosmolaelaps*; Mesostigmata.

## INTRODUCTION

The genus of *Cosmolaelaps* (Berlese, 1903), is cosmopolitan and most of its species are free-livings in soil, litter, organic matter, humus of trees, moss, or on rodents or in its nests (Evans & Till, 1966 & 1979; Bregotova, 1977 and Ramdoori, *et al.*, 2014). In spite of this genus contains about 115 species representing most the country of the world (Moreira *et al.*, 2014), the description of their immature stages are very poor, as only four species have been described (Afifi and Van Der Geest, 1984; El-Borolossy, 1993; Fouly *et al.*, 1997 and Fouly & Al-Rehiyani, 2014).

In Egypt, this genus is represented by four species (*C. zachvatkinae* Sherif & Afifi 1980, *C. keni* Hafez, Elbadry & Nasr 1982, *C. longus* Hafez, Elbadry & Nasr 1982 and *C. paravacus* Nasr & Nawar 1989). Therefore, the aim of the present study is to describe and illustrate the male and immature stages of *C. keni*.

## MATERIALS AND METHODS

During the biological studies of *Cosmolaelaps keni*, ten individuals from each stage (egg, larva, protonymph, deutonymph) and male were after cleared in Nesbitt's fluid, and mounted in Hoyer's media on microscope slides. The line drawings and examinations of the specimens were performed with an Olympus phase contrast microscope equipped with a drawing tube. The nomenclature used for idiosomal chaetotaxy is that of Lindquist & Evans (1965), leg chaetotaxy is that of Evans (1963). All measurements are given in micrometers ( $\mu\text{m}$ ) as means (minimum – maximum). The specimens were deposited in the collection of Acari, in the Department of Pests & Plant Protection, National Research Centre.

## RESULTS AND DISCUSSION

*Cosmolaelaps keni* (Hafez, El-Badry and Nasr).

**Hypoaspis** (*Cosmolaelaps*) *keni* Hafez, El-Badry and Nasr.

*Cosmolaelaps keni* (Hafez, El-Badry and Nasr) Zaher 1986; Moreira *et al.* 2014 and Ramroodi *et al.*, 2014.

**Egg:** Oval, about 266  $\mu$  long and 190  $\mu$  wide (n=7), milky colour with first deposited.

**Larva:**

**Dorsum (Fig.1B):** Idiosoma 297 $\mu$  long and 202 $\mu$  wide (n=5) at level of leg III. Body elliptical, whitish when alive, with 3 pairs of legs. Hypostome with 2 pairs of simple setae (hp1 & hp2), corniculi weakly sclerotized and convergent and closed; deutosternum with faintly dentated 6 transverse rows. Chelicera chelate and weakly sclerotized; dorsum with 14 pairs of simple setae: 10 pairs on podonotal region ( $j_1, j_3-j_6, z_2, z_4, z_5, s_4$  and  $s_6$ ), opisthonotal region with 4 pairs of setae ( $J_5, Z_4, S_4$  and  $S_5$ ). Length of some dorsal setae:  $j_1$ = (15-18),  $j_6$ =(31-34),  $z_4$ = (11-15),  $Z_4$ = (24-29).

**Venter: (Fig.1A):** Tritosternum with a slender base and developed pairs of setoses laciniae; sternal shield little distinct, with 3 pairs of sternal setae; opisthogaster with 4 pairs of setae ( $Jv_1, Jv_2, Jv_5$  and  $Zv_2$ ) in addition to the 3 anal setae; anal shield weakly sclerotized, post-anal and paranal setae simple. Length of some ventral setae:  $st_1$ = (14-17),  $Jv_1$ = (12-15),  $postanals$ = (31-37),  $paranals$ = (22-28).

**Chaetotactic formula of genua and tibiae of legs as follows:**

	I	II	III
Genu	$\begin{matrix} 2 & 2 \\ 1 & - & 1 \\ 1 & 1 \end{matrix}$	$\begin{matrix} 2 & 2 \\ 1 & - & 1 \\ 0 & 0 \end{matrix}$	$\begin{matrix} 2 & 2 \\ 1 & - & 1 \\ 0 & 0 \end{matrix}$
Tibia	$\begin{matrix} 2 & 2 \\ 1 & - & 1 \\ 1 & 1 \end{matrix}$	$\begin{matrix} 1 & 2 \\ 1 & - & 1 \\ 1 & 1 \end{matrix}$	$\begin{matrix} 2 & 1 \\ 1 & - & 1 \\ 1 & 1 \end{matrix}$

**Protonymph:**

**Dorsum (Fig. 2A):** Idiosoma 370 $\mu$  long and 210 $\mu$  wide (n=5) at level of legs III. Body elliptical, whitish when alive with 4 pairs of legs. Hypostome, with 3 pairs of hypostomal (hyp1, 2, 3) setae and a pair of capitular, corniculi parallel and pointed; chelicera more sclerotized and fixed chela with 2 teeth; while the movable with 4 to 5 teeth, variable in size. Dorsal shield with 32 pairs of scimitar – like setae: which are 16 pairs on podonotal region ( $j_1-j_6, z_2-z_5, s_4-s_6, r_2, r_3, r_5$  and  $r_6$ ); while opisthonotal region bearing 16 pairs of setae

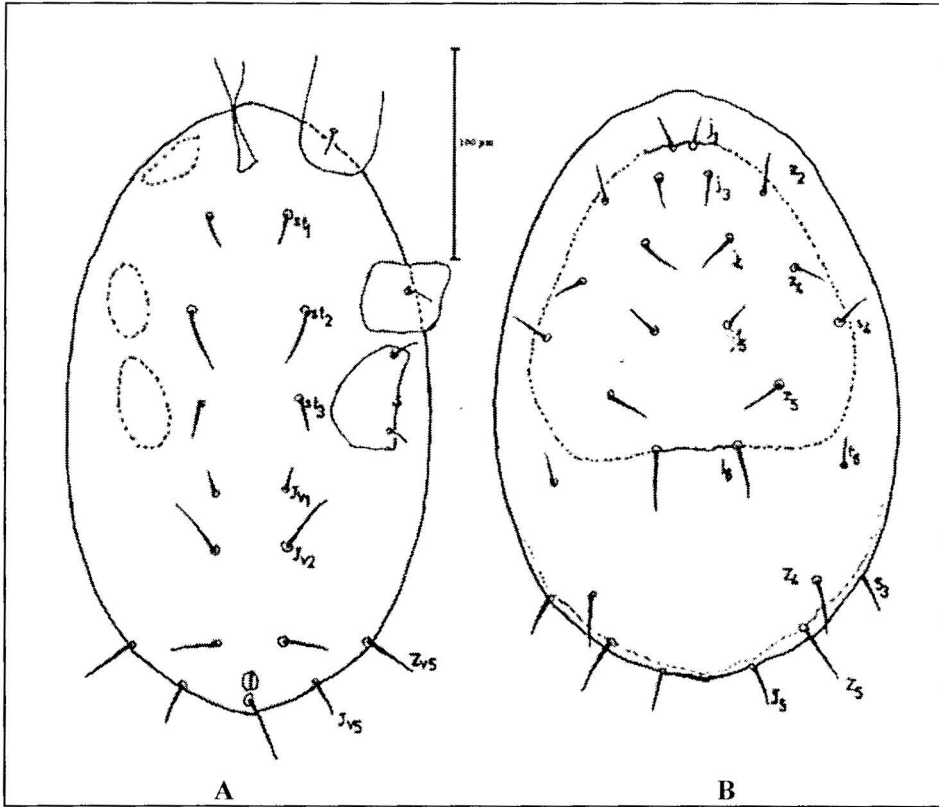


Fig. (1): *Cosmolaelaps keni* (Larvae): A. Venter idiosoma; B. Dorsum idiosoma.

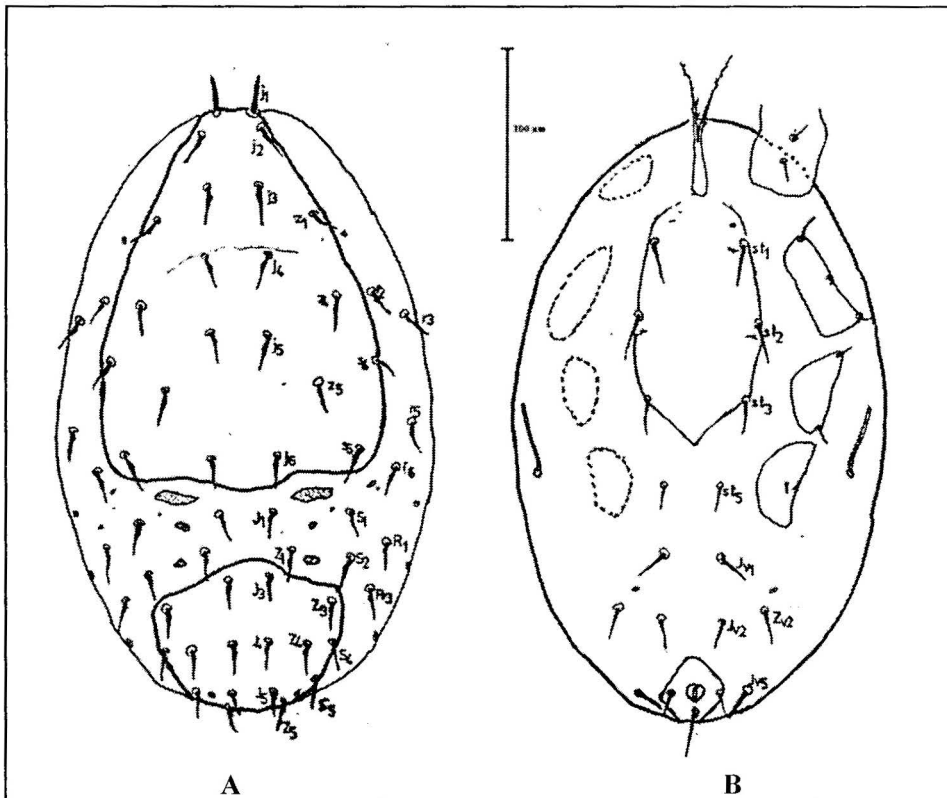


Fig. (2): *Cosmolaelaps keni* (Protonymph): A. Dorsum idiosoma; B. Venter idiosoma.

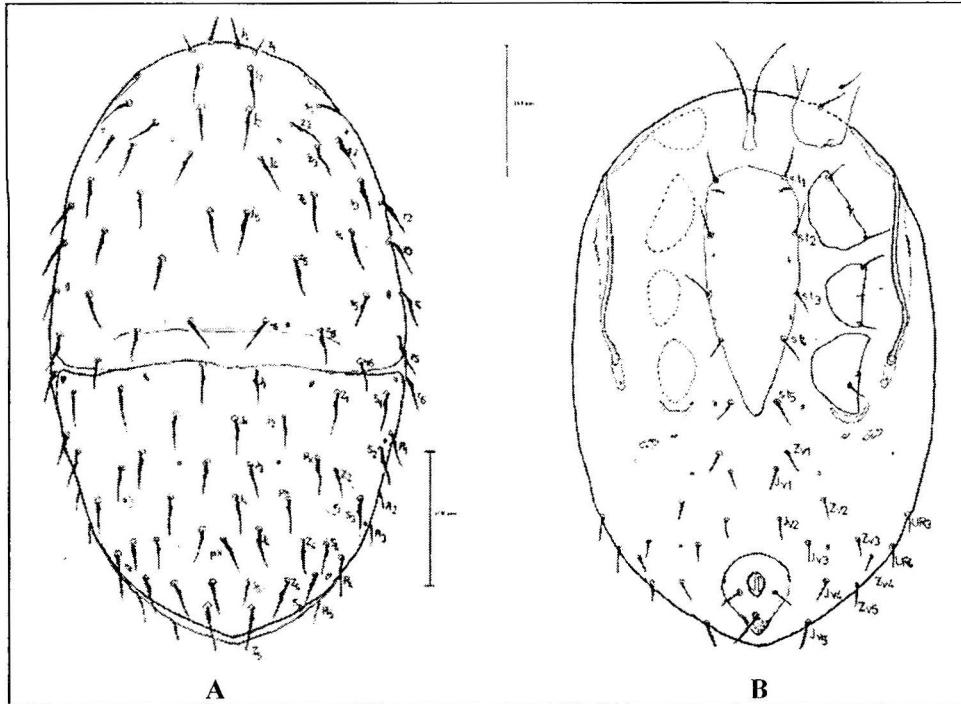


Fig. (3): *Cosmolaelaps keni* (Deutonymph): A. Dorsum idiosoma; B. Venter idiosoma.

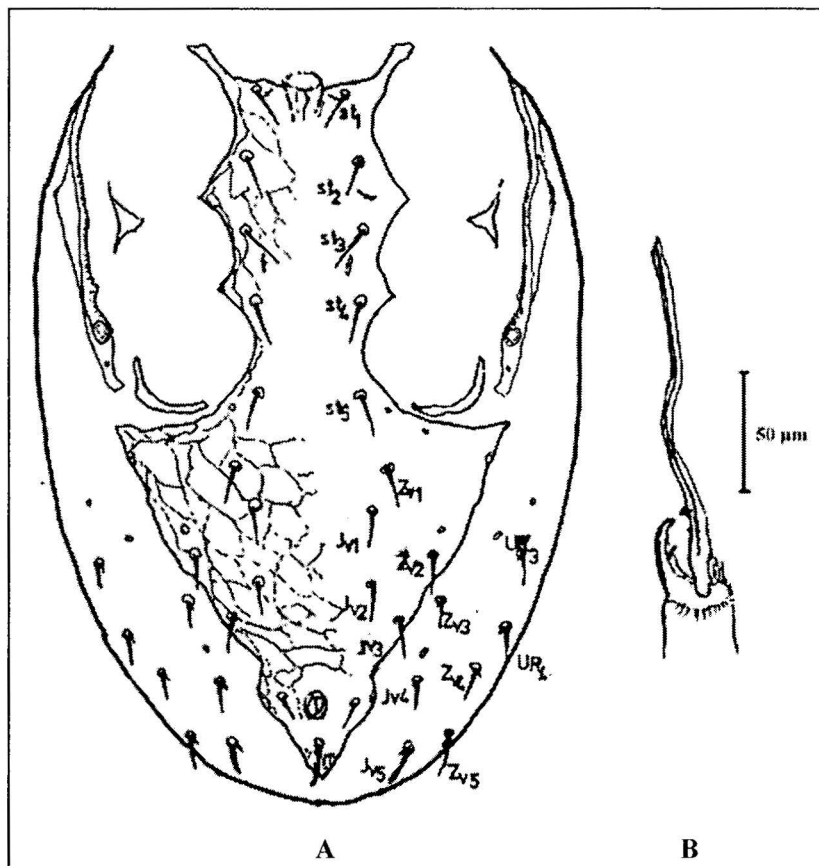


Fig. (4): *Cosmolaelaps keni* (Male): A. Venter idiosoma; B. Spermatodactyl.

( $J_1 - J_5, Z_1 - Z_5, S_2 - S_5 - R_3$  and  $R_4$ ). Length of some dorsal setae:  $j_1 = (19-23)$ ,  $j_6 = (16-20)$ ,  $z_4 = (14-19)$ ,  $Z_4 = (21-25)$ .

**Ventrum (Fig.2B):** Sternal shield weakly sclerotized with 3 pairs of setae and 2 pairs of lyrifissures. Genital setae free on integument. Opisthogaster with 4 pairs of setae ( $Jv_1, Jv_2, Jv_5$  and  $Zv_2$ ). Anal shield subtriangular, with a pair of para-anal setae. Peritremes short, not passthrough coxae III. Length of some ventral setae:  $st1 = (20-25)$ ,  $pan = (13-17)$ ,  $pon = (25-30)$ ,  $gen.s. = (20-23)$ .

**Chaetotactic formula of genua and tibia of legs as follows:**

	I	II	III	IV
Genu	$1 \frac{22}{11} 1$	$1 \frac{22}{00} 1$	$1 \frac{22}{00} 0$	$1 \frac{22}{00} 0$
Tibia	$1 \frac{22}{11} 1$	$1 \frac{12}{11} 1$	$1 \frac{12}{11} 1$	$1 \frac{12}{11} 1$

**Deutonymph:**

**Dorsum (Fig. 3A):** Idiosoma  $455\mu$  long and  $325\mu$  at its greatest wide. Body ovate, light-brown when alive. Dorsal shield entire, with lateral incisions and transverse line between setae  $j_6 - z_6$ ; it bears 40 pairs of setae; all setae scimitar-like except setae  $j_1$  and  $z_1$ , which the former stout-like and the latter simple; 23 pairs setae on podonotum which are ( $j - j_6, z_1 - z_6, s_1 - s_6$  and  $r_2 - r_3, r_6$  off shield) and 4 pairs of pore-like; 17 pairs on opisthonotum ( $J_1 - J_5, Z_1 - Z_5, S_1 - S_5, px_1$  and  $px_2$ ) and 3 unpaired setae between J series ( $Jx_2 - Jx_4$ ) and 7 pairs of pore-like. Integument with 5 pairs of short and simple setae latero-ventrally ( $UR_2$  and  $UR_3$ ).

**Ventrum (Fig. 3B):** Tritosternum well defined and normal. Sterno-genital shield, smooth, with pairs of simple setae and 3 pairs of lyrifissures; genital region narrowed and bears a pair of simple setae, free on integument. Opisthogaster with 10 pairs of simple setae ( $Jv_1 - Jv_5$  and  $Zv_1 - Zv_5$ ); anal shield subtriangular, and smooth, cribrum well developed, extending to level of post-anal setae, being thicker and longer than paranals. Two pairs of metapodal platelets, the internal, one minute. Peritreme, long, extends dorsally to level of setae  $s_1$ .

**Chaetotactic formula of genua and tibia of I - IV as follows:**

	I	II	III	IV
Genu	$2 \frac{33}{21} 2$	$2 \frac{32}{11} 2$	$2 \frac{22}{11} 1$	$2 \frac{23}{10} 1$
Tibia	$2 \frac{33}{21} 2$	$2 \frac{22}{11} 2$	$2 \frac{12}{11} 1$	$2 \frac{13}{11} 2$

**Male:**

**Dorsal idiosoma:** Dorsal shield 427 Long and 307 wide at its broadest point ( $n=5$ ) ornamentation and chaetotaxy as in female.

**Ventral idiosoma (Fig. 4A).** Sternal shield epigenal, endopodal, ventral and anal shields fused into a holovenal shield, reticulated with polygonal ornamentation, bearing 10 pairs of simple setae ( $st_1 - st_5, Jv_1 - Jv_3, Zv_1$  and  $Zv_2$ ), and 7 pairs of pore-like structure, in addition to circumanal setae ( $Jv_4, Jv_5, Zv_3 - Zv_5, UR_2$  and  $UR_3$ ) and 3 pairs of pore-like stricter.

**Gnathosoma:** As in female, except the shape of chelicera (Fig.4B) fixed chelae without teeth (edentate) with sharp pilus denticle, movable chelae modified completely as spermatodactyle (132 - 166) long and having two teeth.

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