

Description of Immature Stages of *Lasioseius lindquisti* Nasr and Abou-Awad (Mesostigmata: Ascidae) with Notes on its Ontogeny

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ABSTRACT

The ascid mite *Lasioseius lindquisti* Nasr & Abou-Awad, was collected from waterhyacinth plant (*Eichhorina crassipes* Mart). The immature stages are described and illustrated with notes on its ontogeny.

Key Words: *Lasioseius lindquisti*, Description, Immature stages, Ontogeny.

INTRODUCTION

During a survey on mites associated with the waterhyacinth, *Eichhorina crassipes* Mart and the aquatic weeds in Egypt (Under publication) *Lasioseius lindquisti* was collected and reared. Lindquist and Evans (1965) reviewed and discussed the previous taxonomic concepts to find out a modified system of nomenclature for setae on the dorsum of the idiosoma and the venter of the opisthoma, using *Lasioseius alli* Chant, with its postembryonic development. Genus *Lasioseius* is probably the most morphologically disparate genus of Ascidae. Approximately 100 species have been described (Halliday *et al.* 1998); but little articles dealing with description of their immature stages and their ontogeny were reported.

In Egypt, some studies have been done dealing with description of the immature stages of this genus, but their ontogeny have not been studied before (EL-Bishlawy, 1978; Afifi, 1982; Nasr *et al.* 1990; Nawar *et al.* 1990 and Nawar & El-Sherif, 1992).

This study aimed to describe and illustrate the postembryonic stages of *L. lindquisti* and its ontogeny.

MATERIALS AND METHODS

Five specimens of each larval, protonymphal, and deutonymphal stages, were cleaned in Nesbitt's solution before mounting in Hoyer's medium. Eyepiece camera was used for drawing the specimens. The systems of notation of morphological structure and chaetotaxy of idiosoma, follow those of Lindquist & Evans (1965), and Evans (1963) for the legs. All measurements are in micrometers (µm). The specimens are deposited in the collection of the National Research Center,

Dokki, Egypt.

RESULTS AND DISCUSSION

Description of Egg and Immature stages:

Egg:

Oval, white, translucent, 132 long and 112 wide.

Larva: Dorsum: (Fig. 1a)

Idiosoma 197–240 long (5 specimens) and 127–160 wide at level of legs III; with lightly sclerotized and smooth podontal shield. Body bears 15 pairs of simple setae: 9 pairs (j_1 , j_3 – j_6 , Z_2 , Z_4 , Z_5 , s_4) on podontal region, while 6 pairs of setae on membrane of opisthonotal region (Z_3 – Z_5 , S_3 , S_4 and S_5) the last two pairs of setae placed so far ventrolaterally, setae Z_4 and Z_5 flagellated and the longest. Length of some dorsal setae:

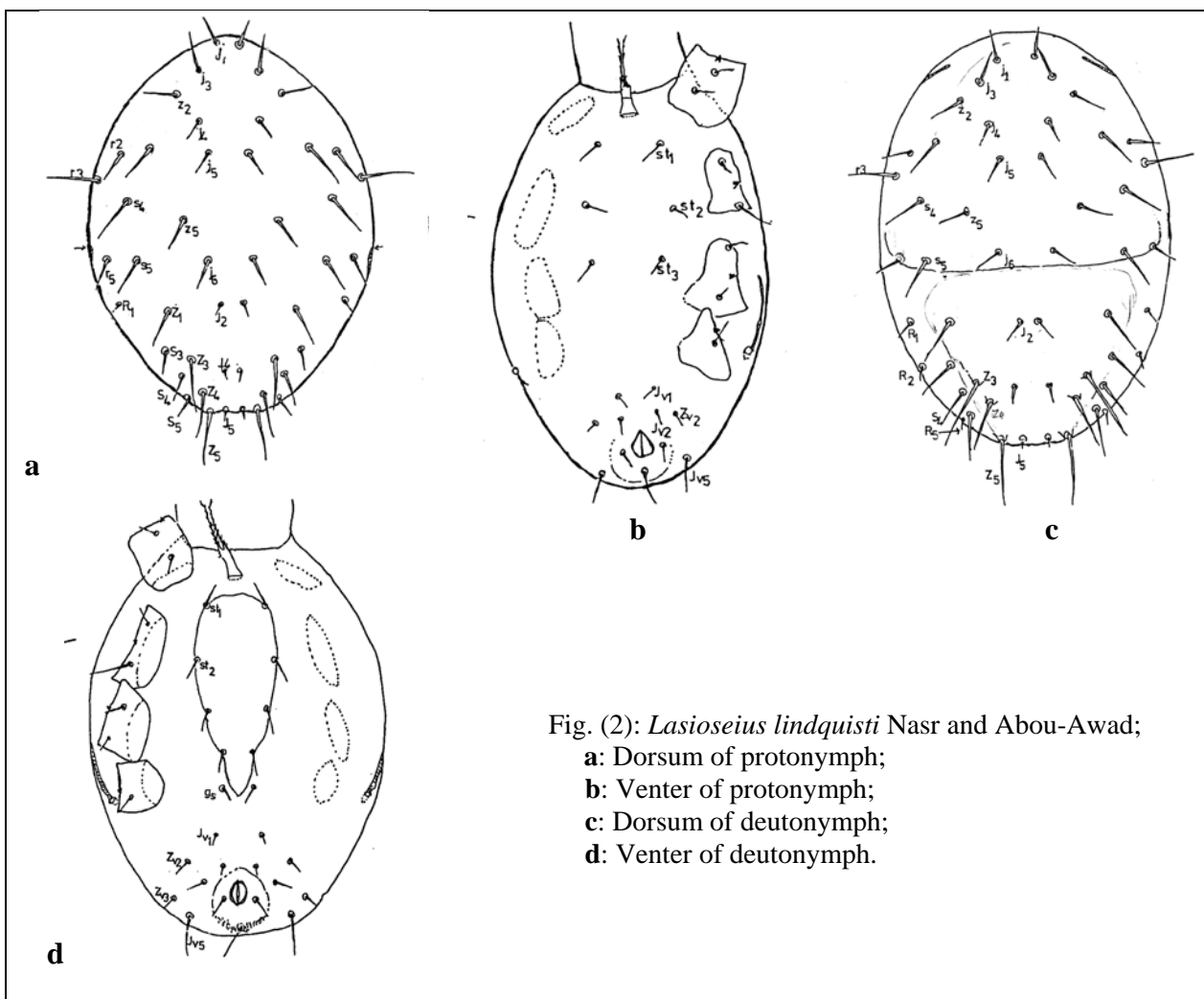
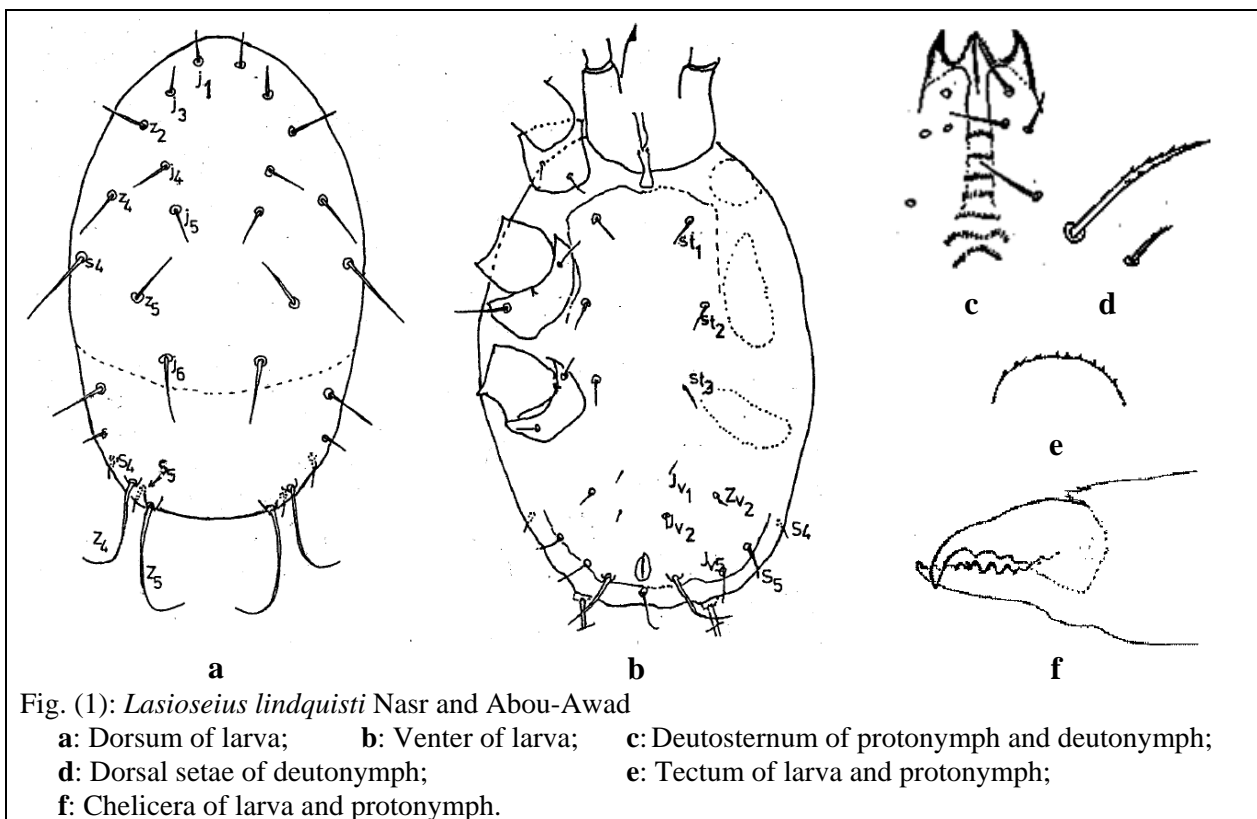
$$\begin{array}{ll} j_1 = 18, & j_6 = 26, \\ z_4 = 25 & \text{and} \quad s_4 = 38. \end{array}$$

Venter: (Fig. 1b)

Tritosternum with a slender base and well developed pair 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 web-like and longer than other ventral setae. Length of some ventral setae;

$$\begin{array}{ll} st_1 = 12, & jv_1 = 6, \\ postanals = 14 & \text{and} \quad para-anals = 25. \end{array}$$

Hypostome with anterior rostral and external posteriore rostral simple setae; corniculi horns and parallel; deutosternum with 7 transverse denticles rows; tectum. (Fig. 1d) weakly defined with anterior denticulate margin; chelicerae (Fig. 1e) movable digit length = 18 with 3 teeth, while the fixed multidenticulated, with short and setiform pilus dentilis.



Chaetotactic formulae of genua and tibiae of legs as follows:

	I			II			III		
Genu	1	$\frac{2}{1}$	$\frac{2}{1}$	1	$\frac{2}{0}$	$\frac{2}{0}$	1	$\frac{2}{0}$	$\frac{2}{0}$
Tibia	1	$\frac{2}{1}$	$\frac{2}{1}$	1	$\frac{1}{1}$	$\frac{2}{1}$	1	$\frac{2}{1}$	$\frac{1}{1}$

Protonymph: Dorsum (Fig. 2a).

Idiosoma 218–250 long and 154–188 wide at level of legs III. Body elliptical, white to yellow when alive, with 4 pairs of legs. Dorsum weakly sclerotized, bearing 13 pairs of setae on anterior region which are $j_1, j_3-j_6, Z_2, Z_4, Z_5, S_4, S_5, r_2, r_3$, and r_5 , while posterior dorsal region bearing 11 pairs of setae which are: $J_2, J_4, J_5, Z_1, Z_3-Z_5, S_3-S_5$ and R_1 , all dorsal setae pilose distally (Fig. 1d).

Venter: (Fig. 2b)

Tritosternum normal as in larva; sternal shield weakly sclerotized with 3 pairs of sternal setae and 2 pairs of lyrifissures; opisthogaster with 4 pairs of setae as in larva; anal shield weakly defined, postanal setae twice as long as para-anals; peritreme short, not passthrough coxae III.

Hypostome (Fig. 1c) with anterior rostral and external posterior rostral setae, internal posterior rostral and capitular setae present. Corniculi, deutosternum, tecum and chelicerae nearly as in larva with more sclerotization and size.

Chaetotactic formulae of genua and tibiae of legs as follows:

	I			II			III			IV		
Genu	1	$\frac{2}{1}$	$\frac{2}{1}$	1	$\frac{2}{0}$	$\frac{2}{0}$	1	$\frac{2}{0}$	$\frac{2}{0}$	1	$\frac{2}{0}$	$\frac{2}{0}$
Tibia	1	$\frac{2}{1}$	$\frac{2}{1}$	1	$\frac{1}{1}$	$\frac{2}{1}$	1	$\frac{2}{1}$	$\frac{1}{1}$	1	$\frac{1}{1}$	$\frac{2}{1}$

Deutonymph: Dorsum (Fig. 2c).

Idiosoma 238–275 long and 166–190 wide at level of legs III. Body oval, cream when alive, dorsum weakly sclerotized bearing 13 pairs of setae on anterior region which are; $j_1, j_3-j_6, Z_2, Z_4, Z_5, S_4, S_5, r_2, r_3$ and r_5 , posterior region having 13 pairs of setae which are: $J_2, J_4, J_5, Z_1, Z_3-Z_5, S_3-S_5, R_1, R_2$ and R_5 , all dorsal setae finely pilose at the distal half of setae. Length of some dorsal setae: $j_1 = 20, r_3 = 31, S_5 = 28, Z_1 = 31.5, Z_3 = 35, Z_5 = 39$.

Venter: (Fig. 2d).

Tritosternum normal. Sternogenital shield weakly sclerotized, with 4 pairs of setae and 3 pairs of pores; a pair of genital setae on integument of

genital area; opisthogasteric region with 6 pairs of ventral setae (Jv_1-Jv_3, Jv_5, Zv_2 and Zv_3). Anal shield semi-circular; postanal setae twice as long as paranals; peritreme long extending dorsally to level of setae j_1 . Length of some ventral setae, $st_1 = 14$, postanals = 20. Hypostome, corniculi, deutosternum (Fig. 1c), tectum and chelicerae as in protonymph.

Chaetotactic formulae of genua and tibiae of legs as follows:

	I			II			III			IV		
Genu	2	$\frac{3}{2}$	$\frac{3}{1}$	2	$\frac{3}{1}$	$\frac{2}{1}$	2	$\frac{2}{1}$	$\frac{2}{1}$	2	$\frac{3}{1}$	$\frac{2}{1}$
Tibia	2	$\frac{3}{1}$	$\frac{3}{1}$	2	$\frac{2}{1}$	$\frac{2}{1}$	2	$\frac{2}{1}$	$\frac{2}{1}$	2	$\frac{3}{1}$	$\frac{1}{1}$

Ontogenetic development of setae on immatures of *Lasioseius lindquisti* Naser & Abou-Awad

Dorsocentral Series		Mediolateral Series		Lateral Series		Marginal Series	
Setae	Stage	Setae	Stage	Setae	Stage	Setae	Stage
Anterior region (Podonotum)							
j_1	(La)	z_2	(La)	s_4	(La)	r_2	(Pn)
j_3	(La)						
j_4	(La)	z_4	(La)			r_3	(Pn)
j_5	(La)			s_5	(Pn)		
j_6	(La)	z_5	(La)			r_5	(Pn)
Posterior region (Opisthonotum)							
J_2	(Pn)	Z_1	(Pn)	S_3	(La)	R_1	(Pn)
J_4	(Pn)	Z_3	(La)	S_4	(La)	R_2	(Dn)
J_5	(Pn)	Z_4	(La)	S_5	(La)	R_5	(Dn)
		Z_5	(La)				

The letter in parentheses indicates the stage in which the seta appears during postembryonic development: La = larva, Pn = protonymph, Dn = deutonymph.

Notes

- The cheliceral digits (Fig. 1e), the seven transverse rows of deutosternal denticles (Fig. 1c), and the tectum (Fig. 1d), with more sclerotization, are relatively constant ontogenetically in *L. lindquisti*.
- The number, arrangement, and ontogenetic development of setae on genual, and tibial segments of legs are similar in larvae and protonymphs of all ascids (Lindquist & Evans 1965) and are like those described for *Pergamasus* by Evans (1963).

The trend of ontogeny in *L. lindquisti* is similar to many species as: *L. berlese* (Oudemans), *L. parberlesei* Bhattacharya, *L. youcifi* Athias-Henriot, *L. mcgregory* Chant, *L. phytoseoides* Chant, and *L. peritremes* Nasr & Abou-Awad. Those are having hypotrichous conditions, whereas the dorsal shield in the deutonymphs and the adults are bearing 22–23 pairs of setae.

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