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MORPHOLOGY AND BIOLOGY OF *TYPHLODROMUS AFRICANUS* N. SP.  
(ACARINA : MESOSTIGMATA : PHYTOSEIIDAE)

BY Abd el-Tawab A. YOUSEF *

**LIFE CYCLE**

**SUMMARY :** Different stages of *Typhlodromus africanus* n. sp., were described. At 25°C, the total period of female immature stages averaged 5.2 days, when the predator was fed on immature stages of *Tetranychus arabicus* Attiah. The male emerged earlier.

**INTRODUCTION**

Different species of the genus *Typhlodromus* Scheuten, were described by ELBADRY (1967, 1968), ZAHER and SHEHATA (1969, 1970). The biology of *T. pyri* Scheuten was investigated by ZAHER and SHEHATA (1971).

The present work comprised a description of a new species and its immature stages. The duration, efficiency of the predator immature stages and adults, together with its fecundity, were also studied.

**MATERIALS AND METHODS**

Rearing *Typhlodromus africanus* n. sp., leaf discs of grapevine of about 3 cm in diameter each, were placed on pieces of cotton wool, and put in petri-dishes. Suitable moisture was maintained by adding few drops of water.

Hatching larvae, were reared singly during their life span. A surplus of known numbers of immatures of *Tetranychus arabicus* Attiah were introduced. The killed prey individuals were counted daily and replaced by another alive. The experiment was carried out in an incubator at 25°C, and inspected twice daily.

Ten individuals of each of the predator different stages were mounted in Hoyer's medium and drawn to study their morphology.

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RESULTS AND DISCUSSION

Morphological studies:

*Typhlodromus africanus* n. sp.

**Diagnosis**: This species is closely allied to *T. Zaheri* Elbadry (1967), but differs in having five pores on the dorsal shield; setae M₂ and L₁₀ serrate, the former slightly shorter than the latter; setae M₃ longer than L₆. Chelicera of female with four subapical teeth on the fixed digit, three subapical ones on the movable digit.

**Female**: Dorsal shield (Fig. 1-G) heavily covered by a network reticulation, being larger on the post-scutum; with five pores, of which three on the proscutum; bearing 18 pairs of setae, of which ten in the lateral row. Setae M₂ finely feathered and longer than L₉; setae L₁₀, finely feathered and appearing to be the longest.

Sternal plate oblong, with concaved anterior, concaved lateral and posterior edges, heavily covered by a network reticulation, bearing setae St₁, St₂ and St₃ in addition to two pairs of lyrifissures (Fig. 1-I). Metasternals occurring on a pair of oval platelets, and appearing to be shorter than the genitals. Ventrianal plate nearly pentagonal; preanal area heavily covered by a transverse striae forming a wide network pattern; with three pairs of preanal setae and a pair of minute crescent-shape pores between the third preanals. Ventrally, two pairs of lyrifissures appear behind setae St₁ and anterior to setae St₃ (Fig. 1-H). Leg IV with one macroseta (Fig. 1-K). Idiosoma measuring 406.42 μ long and 266.14 μ wide.

**Male**: Differs from the female in having a small body (Fig. 1-L). Ventrianal plate triangular nearly occupying the opisthosomal venter and covered by a wide network reticulation (Fig. 1-N). Chelicera with two terminal teeth and a pilus denticusl on the inner margin of the fixed digit; movable digit with two subapical teeth (Fig. 1-M). Spermatodactyl elongate, ending in a blunt inner and pointed outer edges (Fig. 1-M). Idiosoma measuring 289.45 μ long and 168.0 μ wide.

**Description of Immature Stages**

**Larva**: Dorsal shield smooth, divided into a large pyriform anterior and a small trapezoidal posterior one (Fig. 1-A). The anterior shield bears setae V, L₁-L₄, D₁-D₃ and M₁. Setae L₄ subequal to D₃ and each of them longer than the others. The posterior shield having setae L₉, L₁₀ and a considerably long and whiplike setae L₁₀.

Ventral plates lacking, sternal setae present (Fig. 1-B). Anus ill-defined, two pairs of preanals, setae VL₃ and CS present, the latter the shortest. The paraanals long while the postanal short. Idiosoma measuring 176.96 μ long and 135.94 μ wide.

**Protonymph**: Dorsal shield complete, smooth, bearing the dorsal setal complement (Fig. 1-C). Setae L₁₀ subequal to M₃, and each appearing to be shorter than L₁₀ but slightly longer than the others. Setae S₁, S₂, stigmata and peritremes appear. Ventrally, two pairs of lyrifissures and long caudals (Fig. 1-D). Idiosoma measuring 197.68 μ long and 138.25 μ wide.

**Deutonymph**: Dorsal shield bearing five pairs of minute pores, of which three on the proscutum (Fig. 1-E). Setae L₁₀ subequal to L₁₀, and each finely serrate.

Ventrally, two pairs of lyrifissures appear behind setae St₁ and anterior to setae St₃ (Fig. 1-F). The metasternals, genitals, setae VL₁ and the second preanals appear. A pair of minute crescent-shape pores observed between the third preanals. Anus surrounded by a triangular and ill-defined plate. Peritremes and peritremal plates developed. Two pairs of short anterior and long posterior metapodal platelets present. Idiosoma measuring 261.66 μ long and 150.23 μ wide.
FIG. 1: *Typhlodromus africanus* n. sp. — A) Dorsal view of larva; B) Ventral view of larva; C) Dorsal view of protonymph; D) Ventral view of protonymph; E) Dorsal view of deutonymph; F) Ventral view of deutonymph; G) Dorsal view of female; H) Female chelicera; I) Ventral view of female; J) Spermatheca; K) Leg IV of female; L) Dorsal view of male; M) Male chelicera; N) Ventral view of male.
Biology of *Typhlodromus africanus* n. sp.

The tested predator passed through a larval and two nymphal stages before being adults. The female active larva, protonymph and deutonymph lasted for 0.9, 1.2 and 8.0 days (Table I).

**Table I :** Duration of immature stages of *Typhlodromus africanus* n. sp. when fed on immatures of *T. arabicus* Attiaḥ, at 25°C.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Average Period (in days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Larva</td>
</tr>
<tr>
<td>Female</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>2.9</td>
</tr>
<tr>
<td>Male</td>
<td>0.8</td>
</tr>
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<td></td>
<td>2.7</td>
</tr>
</tbody>
</table>

A = Active. Q = Quiescent.

The quiescent stages was about 0.7 day. The total period of female immature stages averaged 5.2 days. The male emerged earlier than the female for a period of 0.6 days. **ZAHER** and **SHEHATA** (1971), noticed that the male of *T. pyri* Scheuten emerged earlier than the female for 2.4 days.

The pre-oviposition period was 1.5 days and the oviposition period lasted for 19.1 days. The female and male longevity averaged 45.4 and 36.2 days, respectively. Similarly **HERBERT** (1956) reported that females of *T. tiliae* Oudemans, lived considerably longer than males, when fed on eggs of *T. bimaculatus* Harvey at 70°F (21.22°C).

The predator feeding capacity was increasing as the mite grow up. The female larva, protonymph and deutonymph attacked 2.8, 11.8 and 17.6 immatures of *T. arabicus*, respectively (Tabl II).

The predator female immature stages consumed a total average and a daily rate of 32.2 and 11.1 prey immatures. The female immature stages killed about twice as much as that devoured by the male (Table II).

**Table II : Efficiency of *Typhlodromus africanus* n. sp. in attacking immatures of *T. arabicus*, at 25°C.**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Average number of preys consumed during the predator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
</tr>
<tr>
<td>Female</td>
<td>2.8</td>
</tr>
<tr>
<td>Male</td>
<td>2.0</td>
</tr>
</tbody>
</table>

T = Total average. D = Daily rate.

During the life span, the predator female fed on 948.2 prey immatures, where 96.5% of them were attacked by the adult (916.0 prey individuals), (Table II). Similar results were obtained by **ZAHER** and **SHEHATA** (1971), concerning *T. pyri*.

The female deposited a total average of 43.1 eggs, with a daily rate of 2.24 eggs. Similar daily rate of oviposition was obtained by **BALLARD** (1954) concerning *T. fallacis* (Garman) when fed on males of *T. telarius* (L.) at 78°F (25.55°C).

**REFERENCES**


