

MESOSTIGMATIC MITES (ACARI: MESOSTIGMATA) FROM THE MEDITERRANEAN  
SHORES OF ISRAEL. I. THE GENUS *HYPORSPIS* CANESTRINI, 1884.

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A B S T R A C T

**Two species of hypoaSPIS/ *H. Schuateri* Hirschmann and *H. theodori*' n.ap. .  
(Acarit Mesostigmata) from the Mediterranean shores of Israel, are recorded and  
described.**

INTRODUCTION

The seashore is a rather well defined habitat for acari of many groups. The first comprehensive study of littoral mites was made by Halbert (1920); partial contributions to the subject are by Willmann (1935, 1957, 1959), Evans & Browning (1953) and Haq (1965). Schuster (1960, 1962, 1963, 1965, 1966) contributes to the understanding of the general ecology of shore mites, especially oribatids. Hirschmann (1966) devoted a taxonomic study, including many new descriptions, to mesostigmatic littoral mites.

A special paragraph is devoted to littoral and estuarine mites in Evans, Sheals and Mac Farlane(1961), who include also an appendix with a list of 100 species of littoral mites (Cryptostigmata - 27; Astigmata - 2; Mesostigmata - 47; Prostigmata - 24). Evans et al. divided the habitat into three main zones: intertidal zone (with five subdivisions), tidal debris and salt-marsh, each zone with its characteristic assembly of mites. Their records are summarized in Table I.

Table I. The distribution of littoral mesostigmatic mites according to different zones (compiled from data by Evans, Sheals and Mac Farlane, 1961).

	Intertidal zones	Tidal debris	Salt marsh
No. of species recorded	22	18	17
No. of species recorded from respective zone only	16	12	11
% of habitat specificity	72.7	66.7	64.7

One can easily see the high specificity of the habitat, which is actually even higher than can be informed from the Table, because several species inhabit two zones. Actually 39 species (83.0%) of mesostigmatic mites out of 47 species present in the three zones are habitat specific and presumably show a high degree of habitat selection. The role of habitat selection in specification and evolution has been discussed widely by Mayr (1963) and I should like to point out the possible importance of the littoral fauna for studies pertaining to these problems.

The zonation used by Evans et al. (*op.cit.*) is not applicable to the Israeli shores of the Mediterranean, where the tidal movement is often concealed by wave action, and has mean ranges of 25-30 cm only (Lipkin & Safriel, 1971). The littoral mites collected in this study consist of Berlese funnel extractions of tidal debris. This debris consists mainly of decaying wrack and organic material washed up by the tides, it usually harbours a heavy population of isopodes, sand hoppers and mites.

#### The Genus *HYPOASPIS* Canestrini, 1884

Two species which could be assigned to this genus have been collected from tidal debris. No attempt is made in the present study to assign them to any of the various subgenera of *Hypoaspis*, a problem which is dealt with by Evans & Till (1966), Aswegen & Loots (1970), Costa (1971), Hirschmann (1971) and Karg (1971) without any widely accepted, satisfactory solution.

The two species described in this study, differ from *Hypoaspis* s.str. as conceived by Costa (1971), mainly in two characters; all the dorsal setae are short and stout, their lengths are usually half the distance of two consecutive setae; tarsus II does not bear two subterminal stout, blunt spur-like setae and  $al_1$  and  $pl_1$  are attenuate and needle like. The chaetotactic pattern of the legs is normal for the genus, macrosetae are absent and the chaetotactic formula of the diagnostic genu IV is 2, 3/1; 3/0, 1. Both species key out as *Gaeolaelaps* Trägårdh in the key provided by Evans and Till (1966).

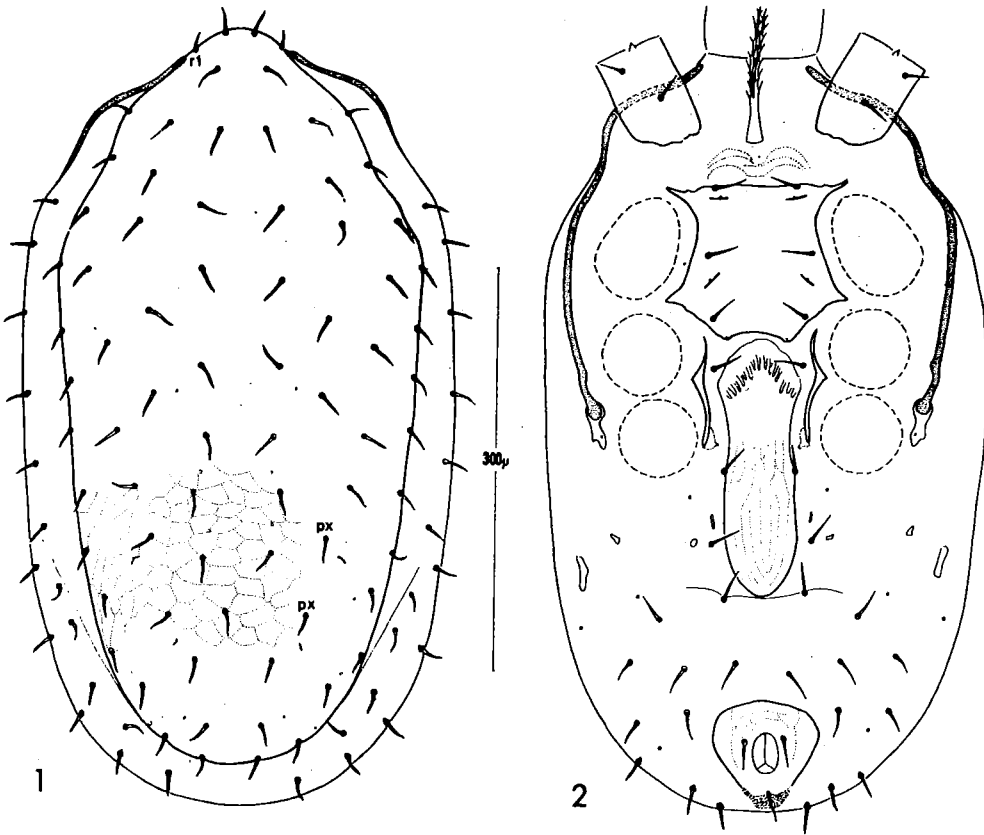
*Hypoaspis schusteri* Hirschmann, 1966

(Figs. 1-7, 14, 16)

FEMALE: A single dorsal shield (280 $\mu$ m wide and 560 $\mu$ m long) covers the dorsum leaving a wide lateral and posterior strip of unsclerotized integument. The ornamented shield is only lightly sclerotized, it bears 37 pairs of stout, short setae. Setae px are present and a single unpaired seta is inserted at the level of the posterior px setae. The distribution and the relative lengths of the setae are shown in Fig. 1. Tectum (Fig. 3) with denticulate anterior margin.

Tritosternum with well developed laciniae. Sternal shield (95 $\mu$ m wide at level of St2, 105 $\mu$ m long) slightly longer than wide, it is only weakly ornamented, posterior margin concave. Sternal setae short, only slightly longer than half the distance between consecutive setae. Metasternal setae inserted on the integument. Genital shield (distance between genital setae 55 $\mu$ m) narrow and tongue shaped. Metapodal shields narrow and slightly irregular. Anal shield triangular and anal setae subequal in length, paranal setae being inserted near anterior margin of anal aperture. The peritreme extends anteriorly beyond coxa I and nearly reaches the base of seta r1 (Fig. 2), it is free anteriorly and posteriorly.

Gnathosome (Fig. 7) with well sclerotized corniculi and fimbriate internal malae, six rows of deutosternal denticles are present (8-12 per row). Chelicera (Fig. 4) with bidentate movable digit, fixed digit with about five teeth and attenuate, seta shaped, pilus dentilis.

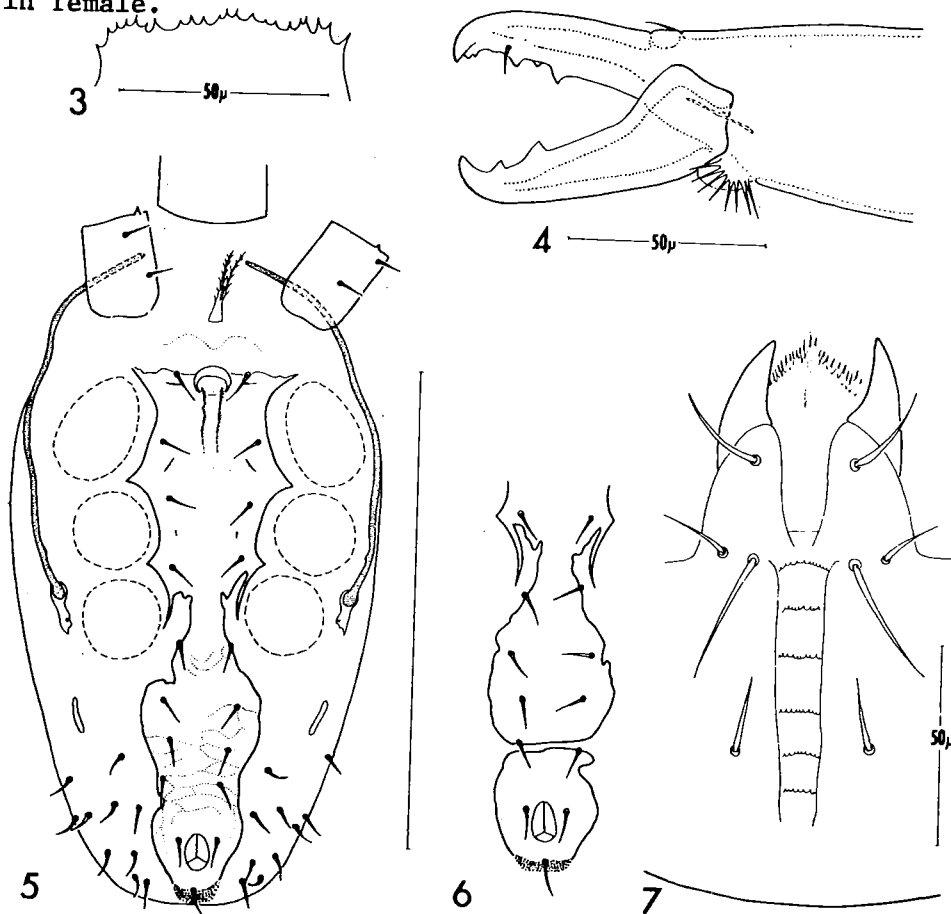


Figs. 1 - 2 *Hypoaspis schusteri* Hirschmann, female.  
1. Dorsum. 2. Venter.

The approximate lengths of the legs (excluding pretarsi) are: I - 590  $\mu\text{m}$ ; II - 350  $\mu\text{m}$ ; III - 310  $\mu\text{m}$ ; IV - 420  $\mu\text{m}$ . Tarsus II with needle-like subterminal setae. Femur, genu and tibia I with characteristic stout, lancet-shaped, ventral and antero-ventral setae (Fig. 14).

MALE: Dorsal shield (230  $\mu\text{m}$  wide and 440  $\mu\text{m}$  long) smaller than in the female, otherwise the same. The venter is covered usually by a holoventral shield (Fig. 5) which bears 8 pairs of ventral setae in addition to the anal setae. In some cases an irregular anal shield may be completely separated from the sternito-ventral shield (Fig. 6). Remaining features as in female.

Movable digit of chelicera (Fig. 16) monodentate, with short, straight, spermadactyl. Fixed digit with 5 small denticles and prominent pulus dentilis. Leg chaetotaxy as in female.



Figs. 3 - 7 *Hypoaspis schusteri* Hirschmann. 3. Female, tectum. 4. Female, chelicera. 5. Male, venter. 6. Male, variation of ventral shields. 7. Ventral view of female gnathosome.

**MATERIAL:** A large number of specimens from algal debris, Nakhsholim, Sept. 20, 1967; same habitat, Shave Ziyon, July 20, 1971; 5 ♀, Dahab (Gulf of Eilat), Oct. 19, 1971. Known **DISTRIBUTION:** Mediterranean shores of Greece, France and Israel, Gulf of Eilat.

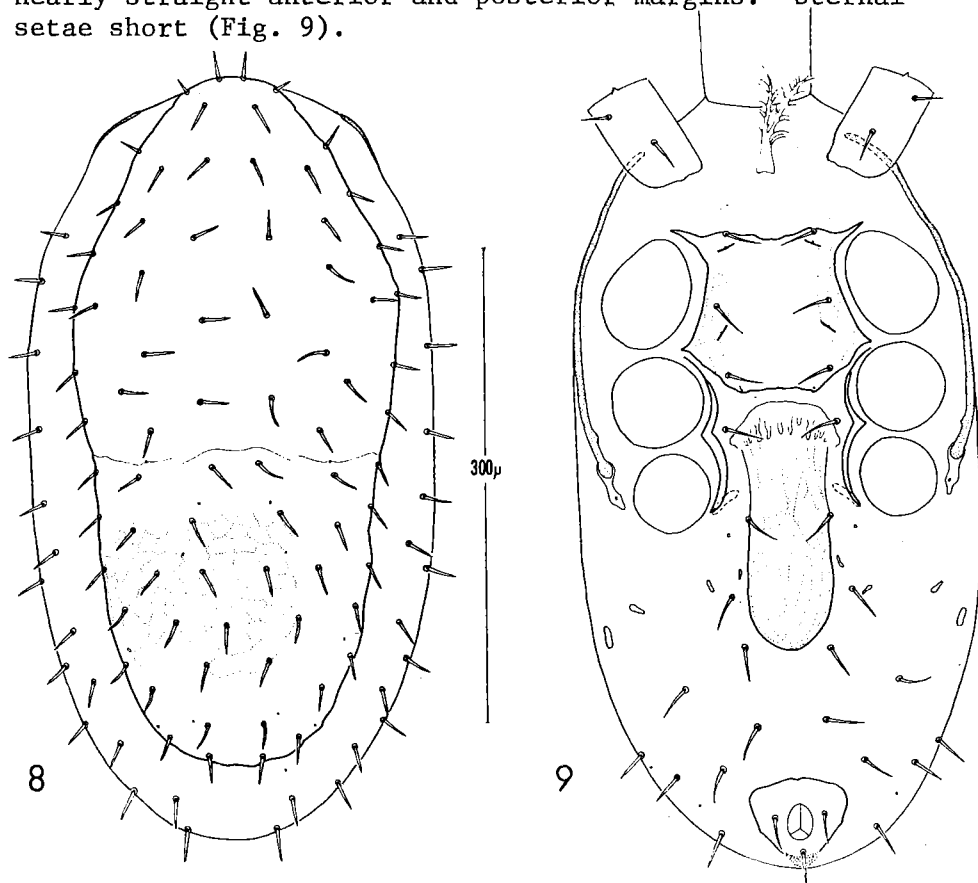
**NOTES:** The specimens described here are larger than indicated by Hirschmann in the original description (260-290  $\mu\text{m}$  long), otherwise they agree with the descriptions and figures.

*Hypoaspis theodori* Costa, n.sp.

(Fig. 8 - 13, 15, 17)

FEMALE: A single dorsal shield (200  $\mu$ m long and 440  $\mu$ m wide) covers the dorsum, leaving a wide lateral and posterior strip of unsclerotized integument. A well defined line separating the anterior and posterior portions of the dorsal shield is present in all examined specimens. The ornamented shield is only weakly sclerotized, it bears 37 pairs of short stout setae, an additional unpaired seta is present at the level of the posterior *px* setae. The distribution and the relative lengths of the setae are shown in Fig. 8. Tectum (Fig. 11) with denticulate anterior margin.

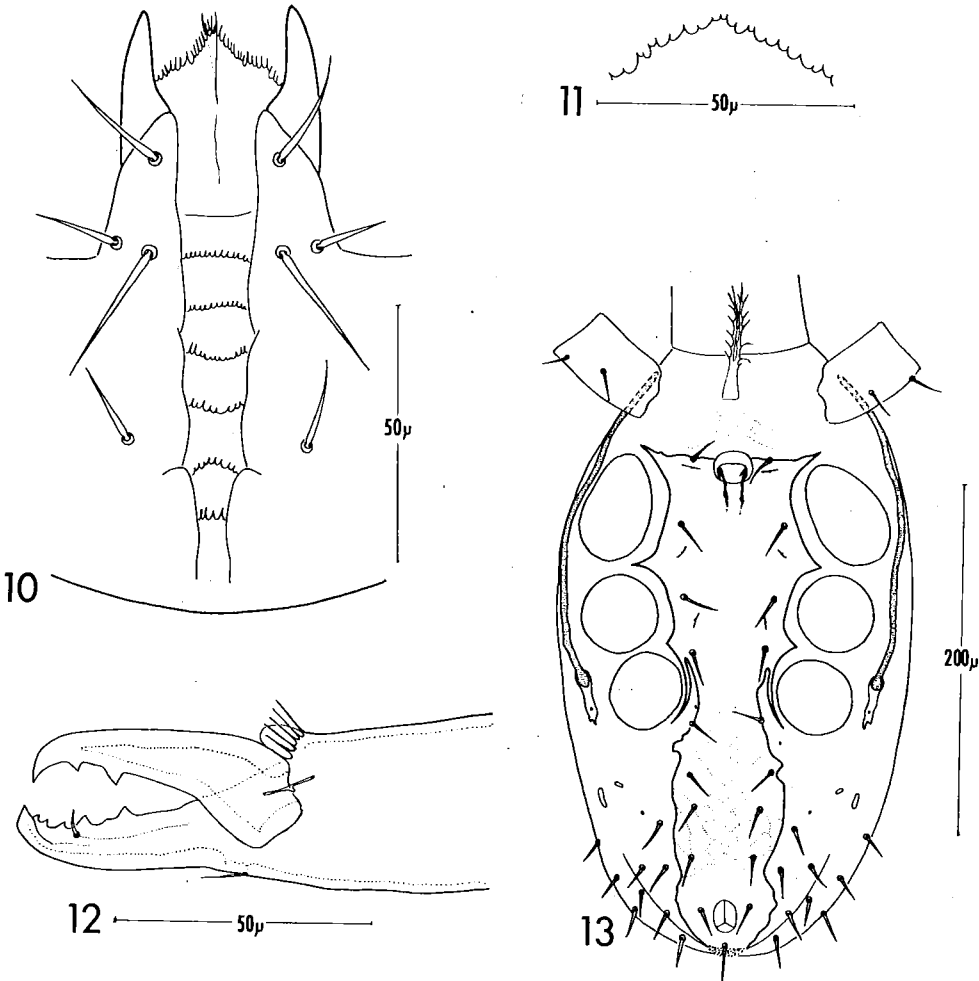
Tritosternum with well developed laciniae. Sternal shield (90  $\mu$ m wide at the level of St 2, 95  $\mu$ m long) with nearly straight anterior and posterior margins. Sternal setae short (Fig. 9).



Figs. 8 - 9 *Hypoaspis theodori* Costa, n.sp., female.  
8. Dorsum. 9. Venter.

Genital shield (distance between genital setae 45  $\mu$ m) tongue shaped. Anal shield triangular. Peritreme extending anteriorly to the middle of coxa I, it is free anteriorly and posteriorly.

Gnathosome (Fig. 10) with well sclerotized corniculi and fimbriate internal malae, six rows of deutosternal denticles (4-13 per row) are present. Chelicera (Fig. 12) with bidentate movable digit, fixed digit with about six teeth and seta-like pilus dentilis.



Figs.10 -13 *Hypoaspis theodori* Costa, n.sp., 10. Ventral view of female gnathosome. 11. Female, tectum. 12. Female, chelicera. 13. Male, venter.

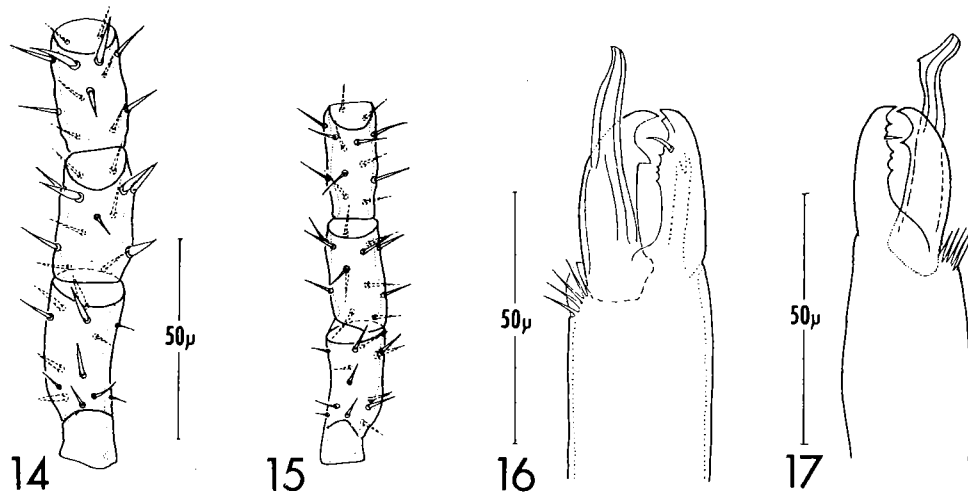
The approximate lengths of the legs (excluding pretarsi) are: I - 460  $\mu\text{m}$ ; II - 320  $\mu\text{m}$ ; III - 300  $\mu\text{m}$ ; IV - 420  $\mu\text{m}$ . Leg chaetotaxy normal, leg I without any stout, lancet-shaped setae (Fig. 15).

MALE: Dorsal shield (200  $\mu\text{m}$  wide and 360  $\mu\text{m}$  long) smaller than in the female, remaining characters similar. The venter is covered by a holovenral shield (Fig. 13) which bears 8 pairs of ventral setae in addition to the anal setae.

Movable digit of the chelicera (Fig. 17) monodentate, with short spermadactyl, whose distal part is in an angular position towards the proximal part.

MATERIAL: Holotype: ♀, algal debris, Nakhsholim, Sept. 9, 1967. Numerous paratypes with the same data. The type specimen and paratypes will be deposited at the British Museum (Natural History).

The new species is named in honour of my teacher, colleague and friend Professor O. Theodor, The Hebrew University, Jerusalem, on the occasion of his 75<sup>th</sup> birthday.



Figs. 14 -17 14. *Hypoaspis schusteri*, leg I. 15. *Hypoaspis theodori*, leg I. 16. *H. schusteri*, male chelicera. 17. *H. theodori*, male chelicera.

#### DISCUSSION

*Hypoaspis schusteri* Hirschmann and *Hypoaspis theodori* Costa n.sp. are doubtless two closely related species inha-



biting the same general habitat. For the time being we have no indication how the two species differ in their requirements and adaptations and how the principle of competitive exclusion is not violated.

The two species are easily separated by the following characters: size, shape of setae on leg I (Fig. 14, 15); shape of spermadactyl (Fig. 16, 17).

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