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NEW OBSERVATIONS
ON THE HYADESIIDAE (ACARI, ASTIGMATA)
DESCRIPTION OF THREE NEW SPECIES
OF THE GENUS *HYADESIA* MEGNIN, 1891

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NEW OBSERVATIONS ON THE HYADESIIDAE (ACARI, ASTIGMATA)
DESCRIPTION OF THREE NEW SPECIES
OF THE GENUS *HYADESIA* MEGNIN, 1891

BY A. FAIN¹ and R. SCHUSTER²

TAXONOMY
INTERTIDAL
AREA

SUMMARY : *Hyadesia sellai* Viets, 1937 is recorded from a new locality in Lokrum, Yugoslavia and three new species of *Hyadesia* are described, all from the intertidal area : *H. arabica* n. sp. from the Red Sea in Egypt, *H. verrucosa* n. sp., from the Adriatic coast in Yugoslavia and *H. pakistanensis* from the sea coast in Karachi, Pakistan.

TAXONOMIE
ZONE
INTERCOTIDALE

RÉMUSÉ : *Hyadesia sellai* Viets, 1937 est signalé d'une nouvelle localité à Lokrum en Yougoslavie et trois nouvelles espèces d'*Hyadesia* sont décrites, toutes en provenance de la zone intercotidale : *H. arabica* n. sp. de la Mer Rouge en Égypte, *H. verrucosa* n. sp. de la Côte Adriatique en Yougoslavie et *H. pakistanensis* n. sp. de la côte océanique à Karachi au Pakistan.

INTRODUCTION

All the species of *Hyadesia* that we record herein originate from ecological-zoogeographical investigations on the coastal fauna by R. S., who collected by himself most of the material during field studies.

Hyadesia sellai Viets, known only from some places in Yugoslavia, is now recorded from a new locality, also in this country. Three new species of *Hyadesia* are described : *H. arabica* n. sp. from the Red Sea in Egypt, *H. verrucosa* n. sp. from the Istrian Coast in Yugoslavia and *H. pakistanensis* n. sp. from the sea coast in Karachi, Pakistan.

Measurements : *Length of the tarsi* : it does not

include the pretarsus and the apical spine. *Length of the claws* : measured in straight line, not including the short basal part embedded in the apex of the pretarsus.

The holotypes of the new species are deposited in the Institut royal des Sciences naturelles de Belgique (IRSNB).

1. *Hyadesia (Hyadesia) sellai* Viets, 1937.

This species has been described from Rovigno, Istria, Italia (= at present Rovinj, Yugoslavia) and from Split, Dalmatia, Yugoslavia, both localities situated along the Eastern Coast of the Adriatic Sea. Other localities in Dalmatia were recorded by SCHUSTER (1962).

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Three new specimens (including male and female) have been found by R. S. in "trottoirs" of the calcareous alga *Lithophyllum tortuosum* on the west-coast of the island Lokrum near Dubrovnik, Yugoslavia (n° Da-24) in August 1968.

2. *Hyadesia (Hyadesia) arabica* nov. spec.

Hyadesia sp. SCHUSTER, 1965 : 328.

This species is represented only by the holotype male. It has been briefly described by SCHUSTER.

Male (Figs. 1-6) : Idiosoma in the holotype 420 μ long and 310 μ wide. This specimen is strongly flattened. *Dorsum* : Propodonotal shield 78 μ wide and 18 μ long in the midline. There is a pair of lyrifissures behind the shield. Cuticle behind this shield without punctation. Sejugal furrow not visible probably because the specimen is strongly flattened. Oil grooves normally developed, crossing forwards the area of the sejugal furrow, and forked at their anterior extremity. *Venter* : Only one pair of genital setae. Genital organ rounded, about 50 μ long

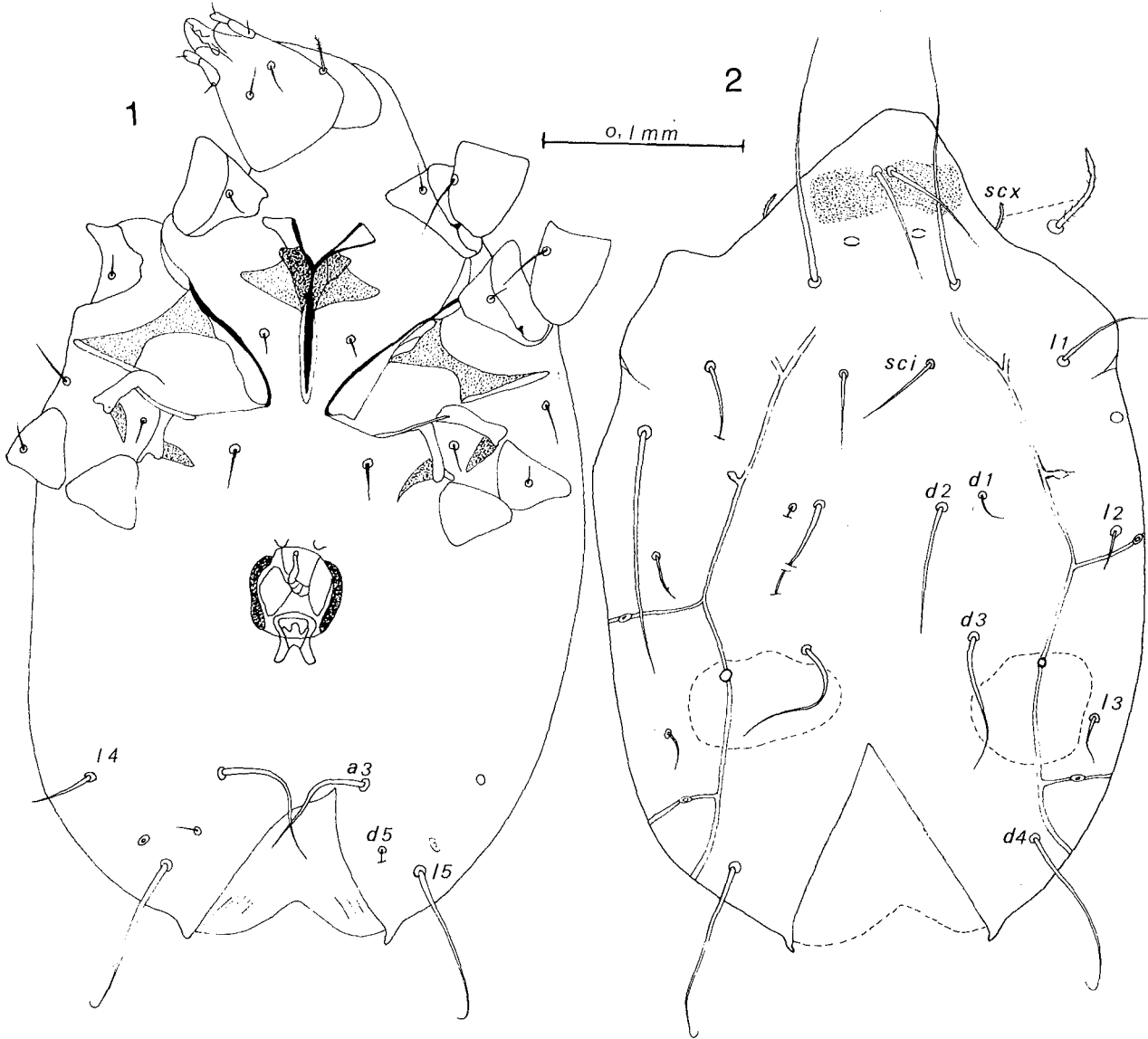
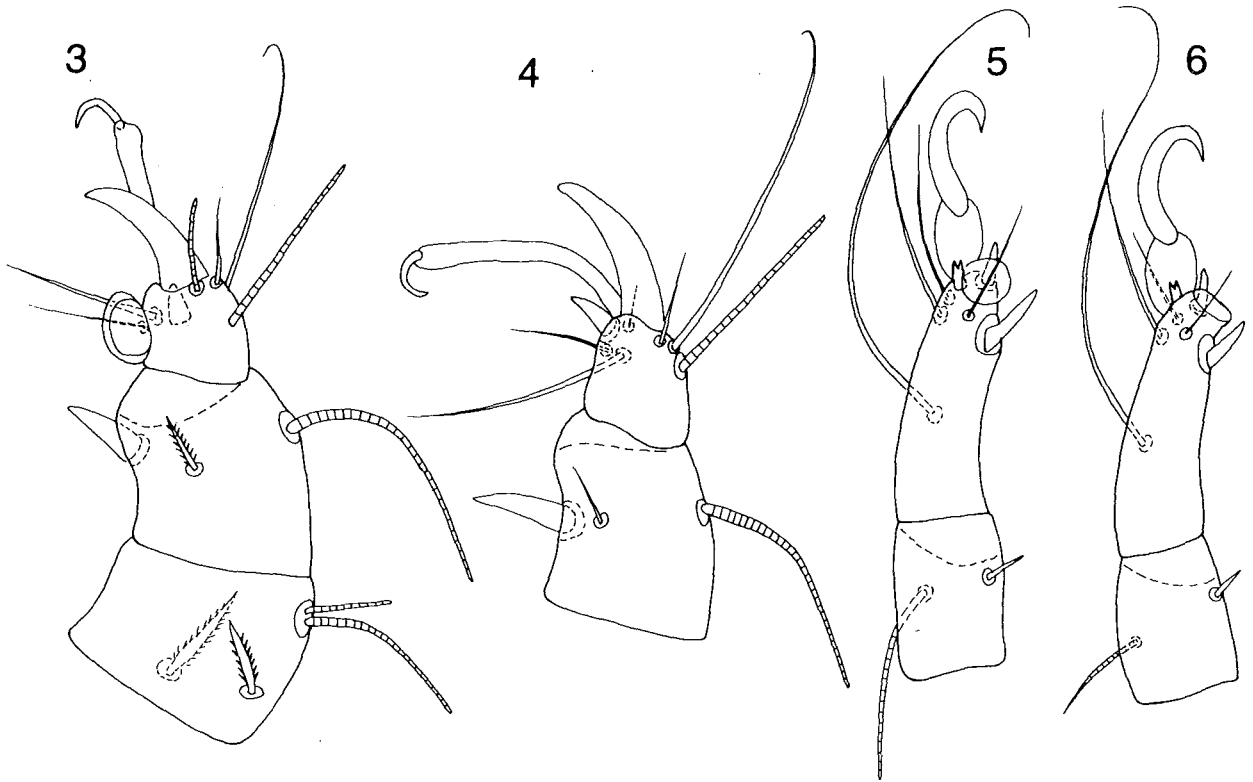


FIG. 1-2 : *Hyadesia (Hyadesia) arabica* n. sp. Holotype male in ventral (1) and dorsal view (2).



FIGS. 3-6 : *Hyadesia (Hyadesia) arabica* n. sp. Holotype male. Apical segments of legs I (3), II (4), III (5) and IV (6).

and $45\ \mu$ wide, bearing along its anterior margin two small sclerotized rings (= vestigial genital suckers). Length of tarsi I to IV (in μ) : 18 — 22 — 45 — 45. A rounded ventro-apical sucker is present on tarsi I, III and IV. Claws I to IV 6 — 6 — 18 — 18 μ long. Tarsi I with 4 (or ? 5) thin setae, one strong apical spine and one smaller preapical spine. Tarsi II with 5 thin setae, one strong apical spine and one much smaller preapical-ventral curved spine. Tarsi III and IV with 4 thin setae, one small subapico-dorsal bifid spine and two ventral preapical or subapical short spines. Tibia I with a strong ventral non barbed and a smaller lateral bipectinate seta. Tibia II as tibia I but the lateral seta is bare. Tibiae III and IV with a short ventral narrowly spinous seta. Genu I with 2 thick bipectinate setae. *Solenidiotaxy* : Tarsi (I to IV) 2 — 1 — 0 — 0. Genu I with 2 solenidia 16 μ and 35 μ long respectively.

Chaetotaxy of idiosoma (in μ) : *sc i* 42 ; *sc e* 135 ; *d2* 75 ; *d3* 70 ; *d4* 90 ; *d5* 7 ; *l1* 27 ; *l2* and

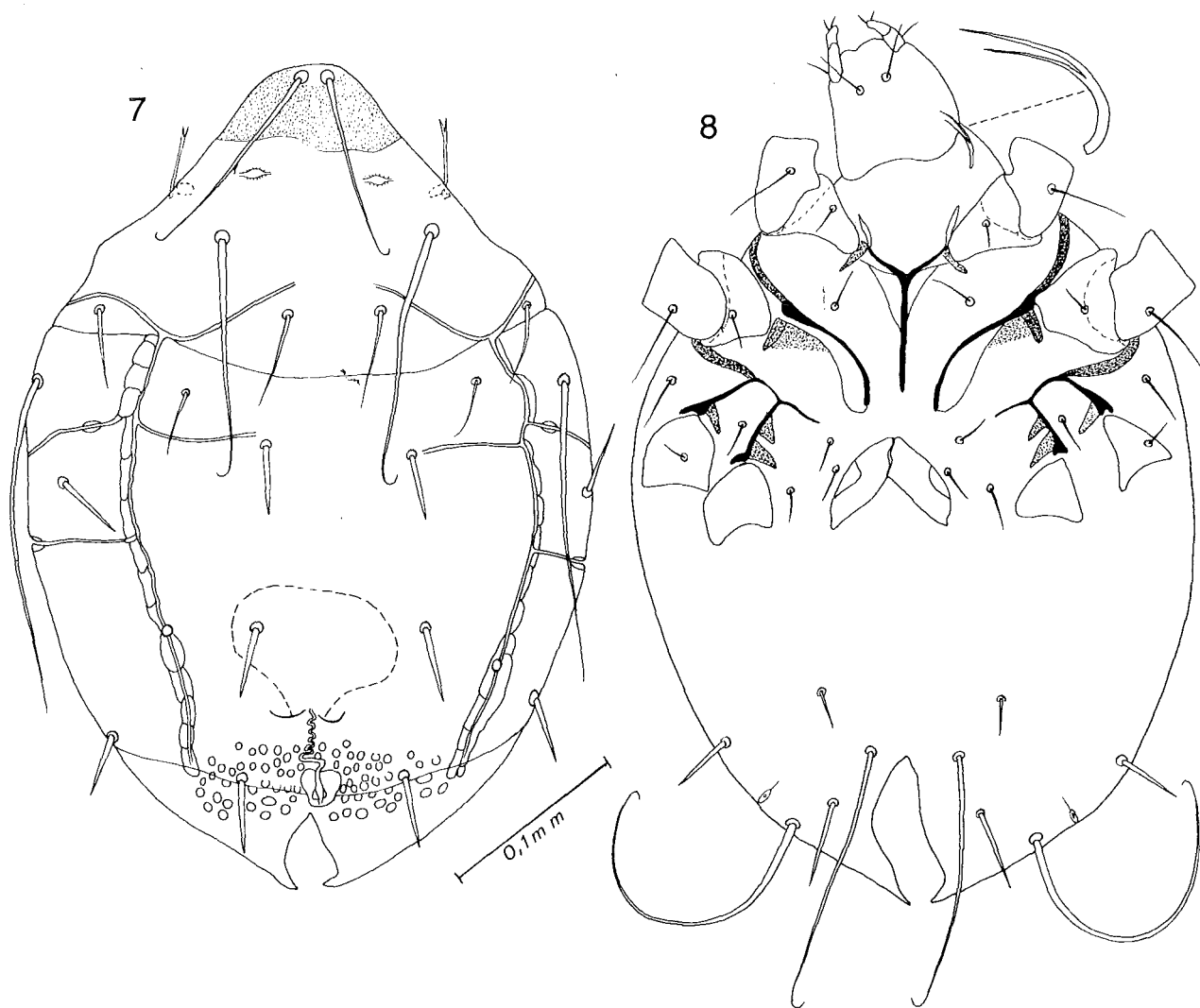
l3 20 ; *l4* 30 ; *l5* 80. There is only one pair of genital setae and one pair of anal setae *a3* 80 μ long. Setae *s cx* 18 μ long, shortly barbed.

Locality and types.

Holotype and only known specimen from the intertidal area of the Red Sea at Al Ghardaqa, Egypt, January 1962 (N° RS-509). The substratum was a porous calcareous material (see SCHUSTER 1965, sample wRM-02). Holotype in the IRSNB.

Remarks :

This species is the most close to *H. sellai* Viets, 1937 (see redescription by FAIN, 1981). It differs from it by the following characters : presence of only one pair of anal setae (2 pairs in *H. sellai*) ; most of the dorsal setae are much shorter than in *H. sellai* while the *a3* setae are distinctly longer ; the spine of tibia II is much thinner ; the 2 soleni-



FIGS. 7-8 : *Hyadesia (Hyadesia) verrucosa* n. sp. Female in dorsal (7) and ventral (8) view.

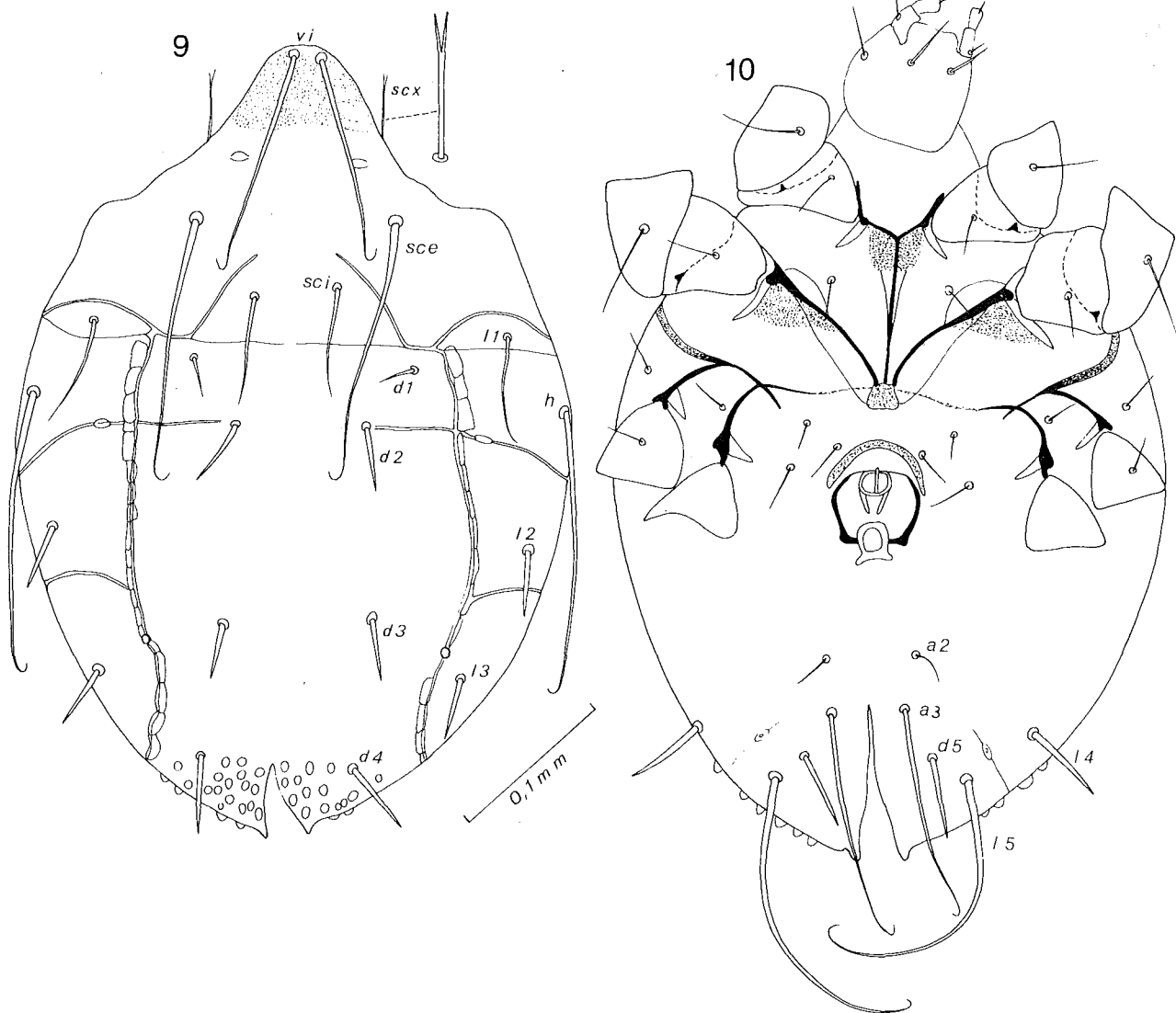
dia of genu I are less unequal (ratio 1 : 2, for 1 : 3 in *H. sellai*) ; the spinous setae of tibiae III and IV are thinner.

3. *Hyadesia (Hyadesia) verrucosa* nov. spec.

Female (Figs. 7-8, 11-14) : Holotype larvigerous 480 μ long and 318 μ wide (idiosoma). In 3 paratypes : 500 \times 345 μ (larvigerous), 515 \times 375 μ and 525 \times 380 μ (larvigerous).

Dorsum : Propodonotal shield much wider than long, followed by 2 lyrifissures. Oil grooves

crossing the sejugal furrow and forked anteriorly. The cuticle along the two main oil grooves presents elongate verrucae. Posterior part of the dorsum, at the level of the copulatory papilla, bearing numerous rounded verrucae. Copulatory papilla relatively large, situated at 45 μ from the posterior extremity. *Bursa copulatrix* narrow. *Spermatheca* broad with a poorly sclerotized base. *Venter* : Sternum free, 60 μ long. All the coxae poorly sclerotized. Epimeres III and IV fused. There are three pairs of genital setae (15 to 25 μ long). *Legs* : Length of tarsi I to IV (in μ) 30 — 30 — 48 — 57 ; lengths of the claws 15 — 15 —



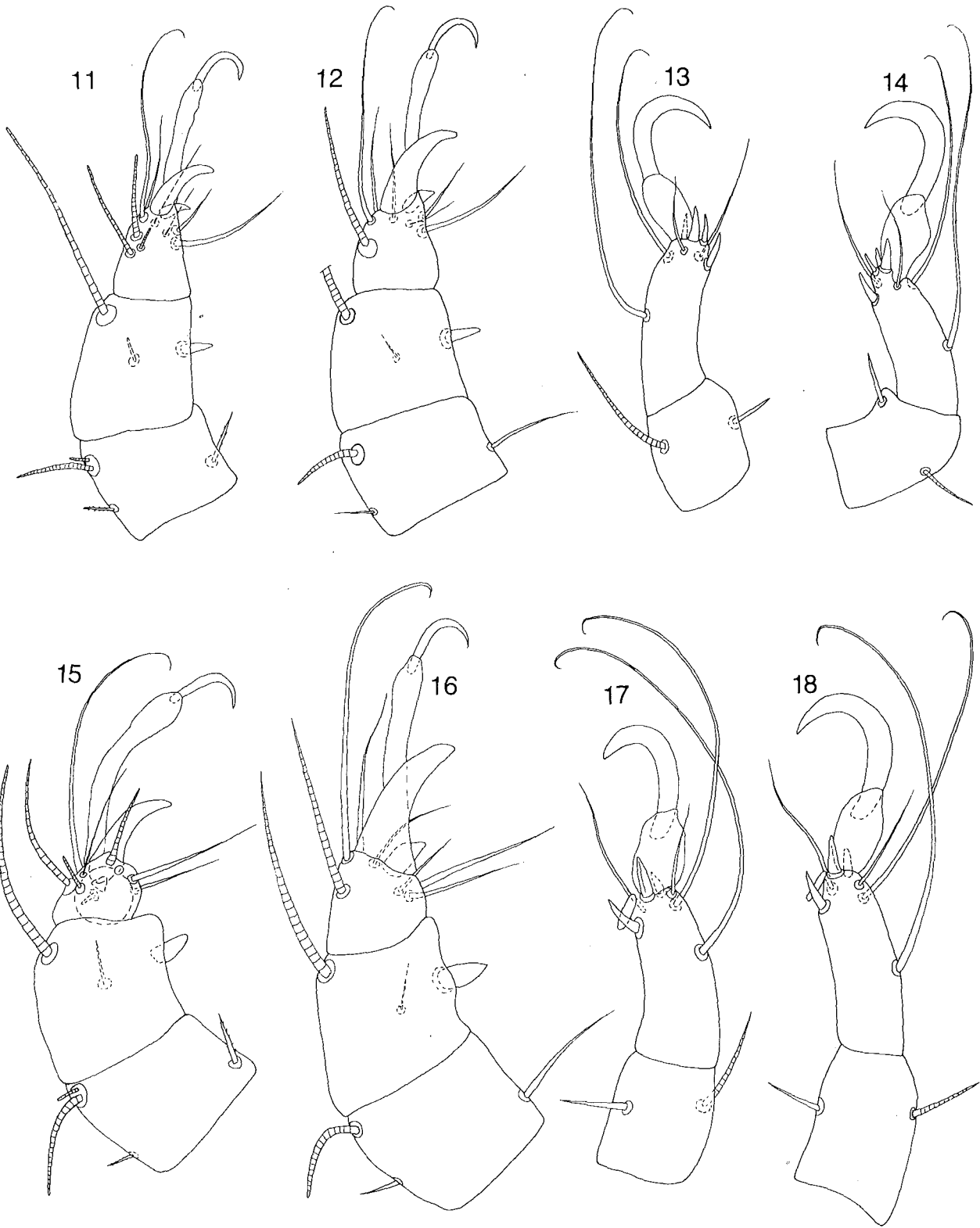
FIGS. 9-10 : *Hyadesia (Hyadesia) verrucosa* n. sp. Male in dorsal (9) and ventral (10) view.

27 — 27. Organ of Grandjean curved with forked apex, 42 μ long.

Chaetotaxy of idiosoma (length in μ) (holotype and paratypes) : *vi* 120 ; *sci* 52 (thin) ; *sce* 135 ; *d1* 33 (thin) ; *d2* 33 ; *d3* 36 ; *d4* 48 ; *d5* 45 ; *l1* 39 ; *l2* 32 ; *l3* 33 ; *l4* 45 ; *l5* 165 ; *h* 145 ; *sh* 27 ; *scx* 36 not barbed but forked apically ; *a2* 18 ; *a3* 100-120. The *a1* are lacking. The setae *vi*, *sce*, *a3* and *l5* are hooklike on their apices. Setae *d2*, *d3*, *d4*, *d5*, *l2*, *l3*, *l4* are distinctly spinous.

Chaetotaxy of the legs : Tarsi I-II with 6 thin setae and 2 spines (one strong apical and a smaller subapico-ventral). Tarsi III and IV with 4 thin setae and 4 subapical spines. Tibiae I-II with a small ventral spine and a thin and short non barbed lateral seta. Tibiae III-IV with a thin ventral spine. *Solenidiotaxy* : Tarsus I with 3 solenidia. Genu I with 2 solenidia, one thin and very short (6 μ) and one thicker and longer (25 μ).

Male (Figs. 9-10, 15-18) : Idiosoma 480 μ long and 318 μ wide. In 3 paratypes 465 \times 325 μ ,



FIGS. 11-18 : *Hyadesia (Hyadesia) verrucosa* n. sp. Female, legs I (11), II (12), III (13) and IV (14). Male, legs I (15), II (16), III (17) and IV (18).

450 × 310 μ and 505 × 335 μ. *Dorsum* as in the female. *Venter* : Sternum fused with epimeres II. Genital organ as wide as long, it is preceded by a strong strongly curved sclerite. Genital and anal setae as in female. *Legs* : Length of tarsi I to IV (in μ) : 28 — 36 — 58 — 65, of claws 15 — 15 — 30 — 30. Tarsi I, III and IV with a rounded sucker.

Chaetotaxy of idiosoma (in μ) : *sc i* 55 (thin) ; *d1* 25 (thin) ; *d2* 32 (spinous) ; *d3* 34 (spinous) ; *d4* 46 ; *d5* 45 (spinous) ; *l1* 39 ; *l2* 30 ; *l3* 36 (spinous) ; *l4* 45 (spinous) ; *l5* 165 ; *a* 2 21 ; *a* 3 120. *Chaetotaxy of legs* : Tarsi I with 5 thin setae, 1 strong apical spine and a small lateral spine. Tarsi II with 6 thin setae and 2 unequal spines. Tarsi III and IV with 4 thin setae and 3 spines. Tibiae and genua as in female. Solenidia as in the female.

Locality and types.

Holotype and 15 paratypes female, 15 paratypes male, 11 paratypes nymphs. From the intertidal area, Adriatic Coast at Rovinj, near the Biological Institute, Istria, Yugoslavia, 28 July 1969 (n° RS 1171). Holotype in IRSNB.

Ecology.

The mites were observed in great numbers in micro-crevices and fissures of shore blocks covered with green algae. Many of them had a green gut content. Also all the faeces which were investigated had a greenish colour. These results lead to the assumption that *H. verrucosa* feeds on green algae, as the other hyadesiid species.

Remarks.

H. verrucosa presents an unique combination of characters which is not encountered in any other species. In both sexes there are 3 pairs of genital setae and 2 pairs of anal setae, the *d5* are present, the propodonal plate is wider than long, the dorsum bears posteriorly and along the oil grooves numerous verrucae and the oil grooves cross the sejugal furrow forwards.

H. halophila Fain, is the most close to this spe-

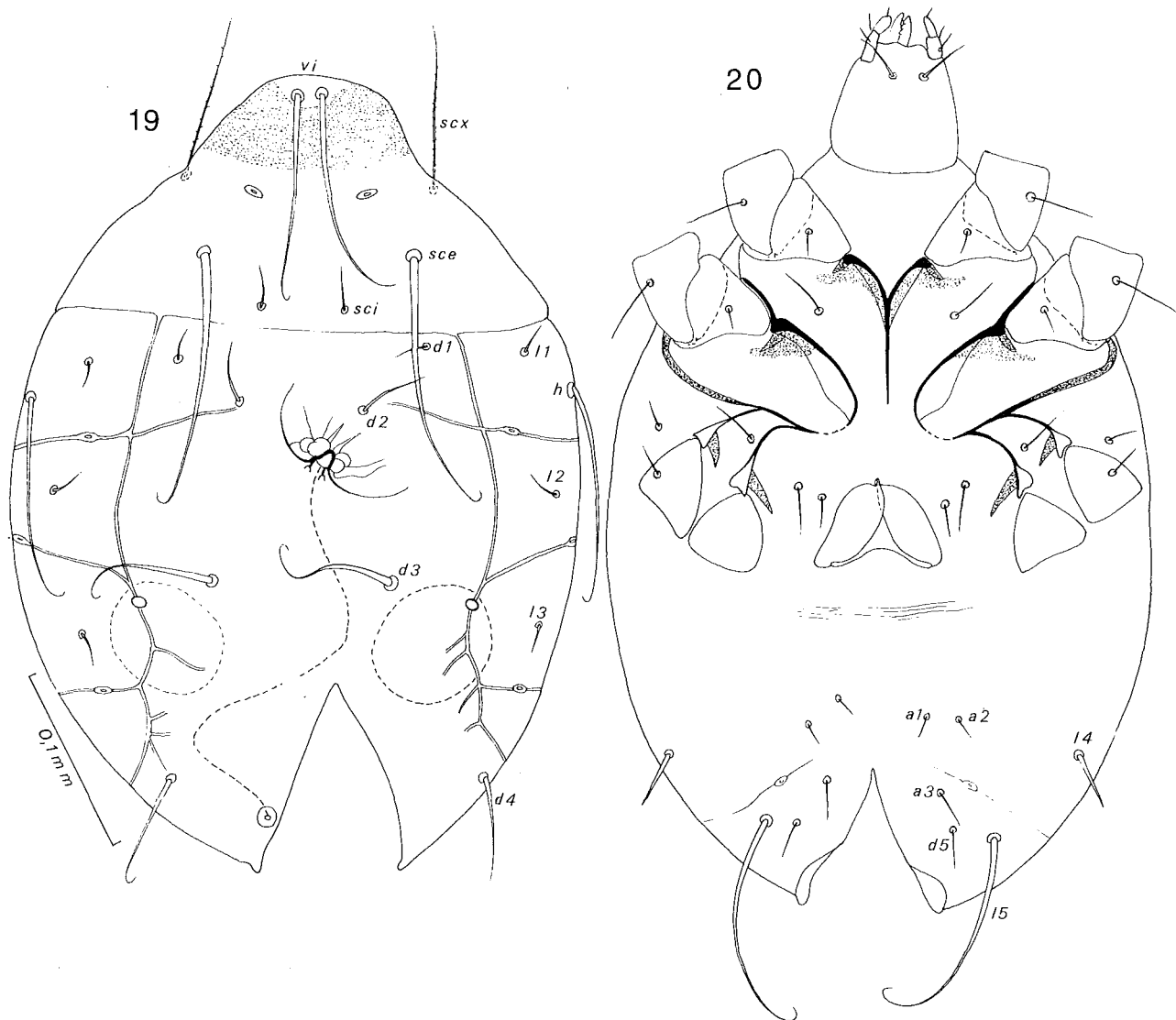
cies, but it differs from the latter by the absence of verrucae, the presence of 3 pairs of anal setae and in the female by the much greater size of the claws (I-II 26 μ, II-IV 39 μ) and the much greater length of setae *d2* to *d4* (150 μ for 35-50 μ in *H. verrucosa*). In the male of *H. halophila* the tarsi are subequal in length (about 30 μ), while in *H. verrucosa* these tarsi are very unequal.

4. *Hyadesia (Hyadesia) pakistanensis* nov. spec.

Female (Figs. 19-20, 23-26) : Holotype 450 μ long and 302 μ wide (idiosoma). In 3 paratypes 465 × 310 μ, 490 × 315 μ (larvigerous) and 495 × 360 μ (larvigerous). *Dorsum* : Propodonal shield much wider than long, followed by two lyrifissures. Oil grooves well developed with several additional branches but not crossing the sejugal furrow forwards. Bursa very long and thin, opening posteriorly through a small rounded papilla situated at 30 μ from the posterior extremity. Basal sclerite of spermatheca wide, conical. Spermatheca containing several rounded poorly sclerotized cells. *Venter* : Sternum 50 μ long. Epimeres II free, arriving close to the complex of epimeres III-IV. Punctuation on coxae I-IV poorly developed. There are 2 pairs of genital setae and 3 pairs of anal setae. *Legs* : Length of tarsi I-IV (in μ) : 30 — 30 — 45 — 48, length of claws 10 to 11 — 10 to 11 — 21 — 21.

Chaetotaxy of idiosoma (length in μ) : *v i* 100 ; *sc i* 23 ; *sc e* 135 ; *d1* 18 ; *d2* 45 ; *d3* 75 ; *d4* 65 ; *d5* 18 ; *l1* 18 ; *l2* 21 ; *l3* 26 ; *l4* 30 ; *l5* 135 ; *h* 115 ; *sh* 18 ; *al* 15 ; *a2* 15 ; *a3* 20 ; *s cx* barbed 100. Organ of Grandjean 30 μ. The setae *v i*, *sc e*, *d3*, *l5*, *h* are hooklike at their apex. Setae *l4* are spines, all the other setae are soft and finely attenuated apically. *Leg chaetotaxy* : Tarsi I-II with 5 thin setae and 2 spines. Tarsi III-IV with 5 thin setae and 3 spines. Tibiae III-IV with a thin ventral seta 18 μ long. *Solenidiotaxy* : Tarsus I with 3 solenidia. Genu I with 2 unequal solenidia (10 μ and 36 μ respectively).

Male (Figs. 21-22, 27-30) : Idiosoma 395 μ long and 270 μ wide. In 2 paratypes : 415 × 255 μ



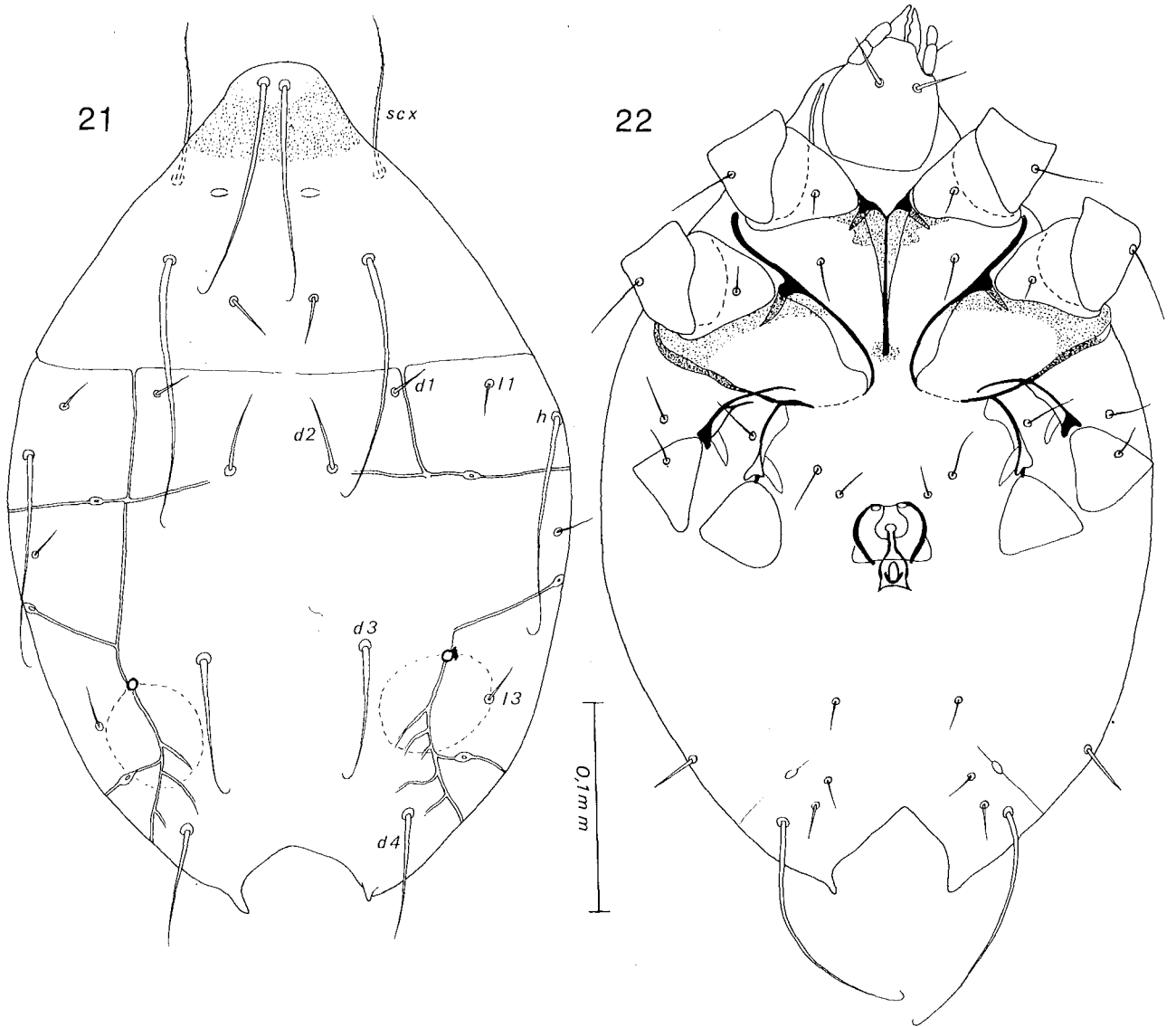
Figs. 19-20 : *Hyadesia (Hyadesia) pakistanensis* n. sp. Female in dorsal (19) and ventral (20) view.

and $390 \times 249 \mu$. Dorsum as in the female, with 4 pairs of lyrifissures. *Venter* : Sternum not fused with epimeres II. There are 2 pairs of genital setae and only 2 pairs of anal setae. Genital organ wider than long. *Legs* : Length of tarsi I-IV (in μ) 24 — 25 — 30 — 30 ; length of claws 8 — 8 — 17 — 18. Tarsi I, III and IV with a sucker. Organ of Grandjean simple, 26μ long.

Chaetotaxy of idiosoma (in μ) : *vi* 100 ; *sc i* 20 ; *sc e* 120 ; *d2* 40 ; *d3* 65 ; *d4* 60 ; *d5* 18 ; *l1*

15 ; *l2* 15 ; *l3* 14 ; *l4* 21 (spinous) ; *l5* 125 ; *h* 110 ; *a2* 10 ; *a3* 18 ; *sc x* barbed 100.

Leg chaetotaxy : Tarsi I with 5 thin setae and a large apical spine. Tarsi II with 6 thin setae and 2 unequal spines. Tarsi III-IV with 5 thin setae, 1 subapical conical spine and 1 preapical truncate spine. Tibiae I-II as in female. Tibiae III-IV with a thin seta 16μ long. *Solenidiotaxy* : Tarsi as in the female. Genu I with 2 solenidia 8 and 35μ long respectively.



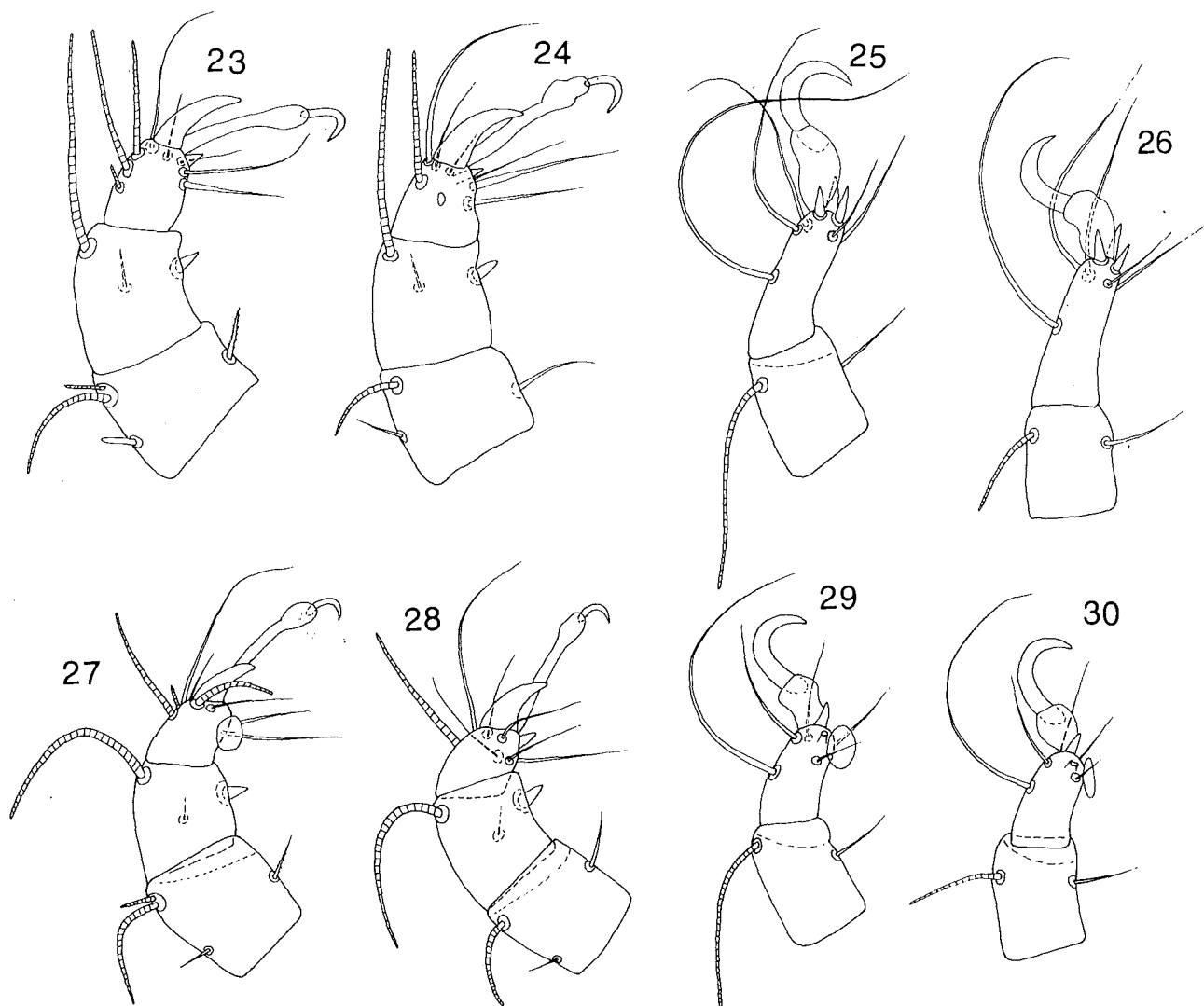
FIGS. 21-22 : *Hyadesia (Hyadesia) pakistanensis* n. sp. Male in dorsal (21) and ventral (22) view.

Locality and types.

Holotype and 6 paratypes female, 5 paratypes male, 1 nymph paratype from the intertidal area of Paradise Point near Karachi, Pakistan, 21 February 1968 (N° RS 307). The rocks were covered with balanids and different algae. The holotype is deposited in IRSNB.

Remarks :

H. pakistanensis belongs to a group of four species (*H. fusca* Lohmann, *H. nearctica* Fain and Ganning, *H. australiana* Fain and Synnot and *H. vietsi* Womersley) presenting the following characters in both sexes : 2 pairs of genital setae, *d5* present, propodonotal shield wider than long,



FIGS. 23-30 : *Hyadesia (Hyadesia) pakistanensis* n. sp. Female, legs I (23), II (24), III (25) and IV (26). Male, legs I (27), II (28), III (29) and IV (30).

genus I with 2 solenidia. The females have 3 pairs, the males 2 pairs of anal setae.

H. pakistanensis differs from *H. fusca* and *H. nearctica* in both sexes by the smaller size of the body, the much shorter length of *a*3 (18-20 μ), of *d*4 (60-65 μ) and *d*5 (18 μ). In *H. fusca* and *H. nearctica* these setae measure 120-150, 135 and 40-50 μ respectively. Moreover the male differs by the subequal lengths of the tarsi I-II (24-25 μ) and III-IV (30 μ). In *H. fusca* and *H. nearctica* the anterior and posterior tarsi are distinctly unequal : the anterior being longer (33-38 μ) than the poste-

rior (27 μ) in *H. fusca* and shorter (18-32 μ) than the posterior (48-52 μ) in *H. nearctica*. Another character is the much smaller length of the claws in the male (claws I-II 8 μ ; III-IV 17-18 μ). In *H. fusca* and *H. nearctica* the claws I-II are 13 to 24 μ and the III-IV 30 to 36 μ long) *H. pakistanensis* differs from *H. australiana* in both sexes by the greater length of the *s cx* setae (100 μ , for 30 μ in *H. australiana*), the relative shorter length of claws III-IV (in male 17-18 μ), in female 21 μ , for 21 and 31 μ respectively in *H. australiana*. Moreover, in *H. pakistanensis* (in both sexes) the

seta *l4* is a spine (a thin seta in *H. australiana*) ; the external genital seta is longer (30 μ) than the internal (12 μ) (in *H. australiana* both setae are 12 μ long) and the setae of tibiae III and IV are very thin (they re spines in *H. australiana*).

H. pakistanensis differs from *H. vietsi*, in the female (the male of that species is unknown) by the smaller size of the body, the much thinner and shorter aspect of the *sci* (23 μ , instead of 75-80 μ in *H. vietsi*), the shorter length of *d2* (45 μ , for 90 μ in *H. vietsi*), of *d3* (75 μ , for 108 μ in *H. vietsi*) and of *d4* (65 μ , for 205 μ in *H. vietsi*), the very thin aspect of setae of tibiae III-IV (spines in *H. vietsi*) and the unequal aspect of the genital setae (equal in *H. vietsi*).

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