



# TWO NEW SPECIES OF MITES OF THE FAMILY HYADESIIDAE (ACARI, ASTIGMATA) FROM COSTA-RICAN AND BRAZILIAN COASTS

BY A. FAIN\* & R. SCHUSTER\*\*

SYSTEMATIC  
ECOLOGY  
HYADESIIDAE  
NEOTROPICS  
SYSTÉMATIQUE  
ÉCOLOGIE  
HYADESIIDAE  
RÉGION  
NÉOTROPICALE

ABSTRACT : Two new species of the genus *Amhyadesia* FAIN & GANNING, 1979 (Acari, Hyadesiidae) are described from the intertidal area : *A. costaricensis* sp. n. from the Pacific Coast of Costa-Rica and *A. brasiliensis* sp. n. from Brazil.

RÉSUMÉ : Deux nouvelles espèces du genre *Amhyadesia* FAIN & GANNING, 1979 (Acari, Hyadesiidae) sont décrites de la zone intertidale : *A. costaricensis* sp. n. de la Côte Pacifique à Costa Rica et *A. brasiliensis* sp. n. du Brésil.

## INTRODUCTION

The family Hyadesiidae comprizes until now 2 genera, *Hyadesia* MEGNIN, 1891 and *Amhyadesia* FAIN & GANNING, 1979, respresented by 19 valid species. Among these, only two species have been recorded from South America : *Hyadesia uncinifer* MEGNIN, 1891, described from Patagonia and *Hyadesia curassaviensis* VIETS, 1936 described from Curaçao.

The present paper deals with a collection of intertidal mites collected by R.S. This collection contains two new species belonging to the genus *Amhyadesia* : *A. brasiliensis* sp. n. from Brazil (collected 1960/61) and *A. costaricensis* sp. n. from the Pacific coast of Costa Rica (collected in 1977)<sup>1</sup>.

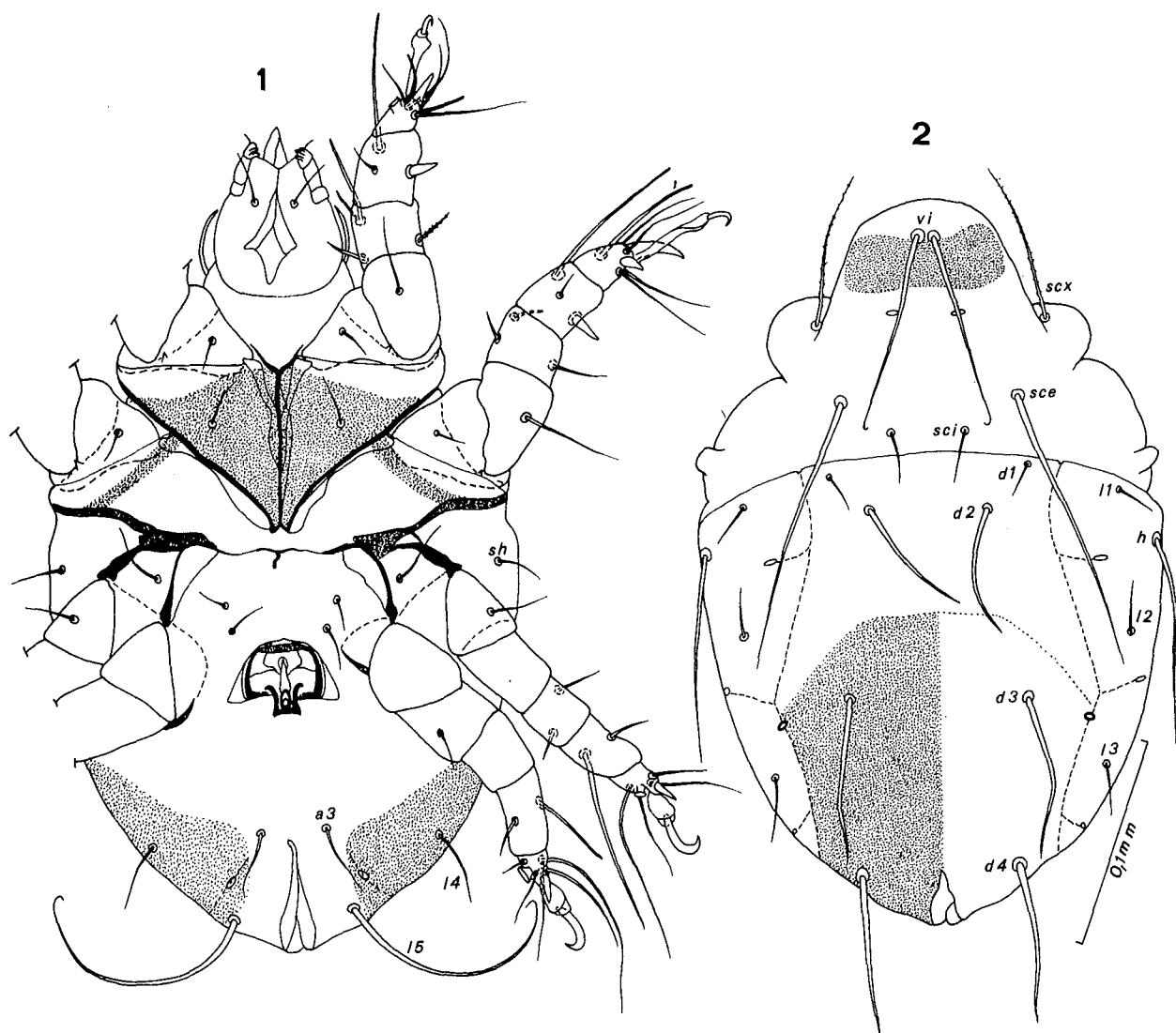
## 1. *Amhyadesia costaricensis* spec. nov.

*Male* : (Figs. 1-6) : Holotype 336  $\mu$  long (idiosoma) and 216  $\mu$  wide (maximum). In two paratype 327  $\times$  205  $\mu$  and 318  $\times$  218  $\mu$ . *Dorsum* : With a large finely punctate shield covering almost all the hysteronotum and extending partly on ventral surface. Propodonal shield 27  $\mu$  long and 60  $\mu$  wide. *Venter* : Sternum fused behind with epimeres II. Epimeres III and IV fused. Coxae I covered by a large punctate shield. Genital organ 37  $\mu$  wide. Gnathosoma 66  $\mu$  long (palps included), 60  $\mu$  wide (base). *Legs* : Tarsi I-IV 25  $\mu$  — 25  $\mu$  — 18  $\mu$  — 16  $\mu$  long respectively (spines and pretarsi not included). Claws I-II 9  $\mu$  ; claws III-IV 21  $\mu$ . Tarsi I-III-IV with a ventroapical sucker.

\* Institut de Médecine Tropicale, 155 Nationalestraat, B-2000 Antwerpen, Belgique.

\*\* Institut für Zoologie der Universität, Universitätsplatz 2, A-8010 Graz, Austria.

1. The soil zoological research programme of R.S. in Costa Rica, at C.A.T.I.E., Turrialba, was supported by FONDS ZUR FÖRDERUNG DER WISSENSCHAFTLICHEN FORSCHUNG, Projekt 3364.



FIGS. 1-2 : *Amhyadesia costaricensis* sp. n. Holotype male in ventral (1) and dorsal (2) view.

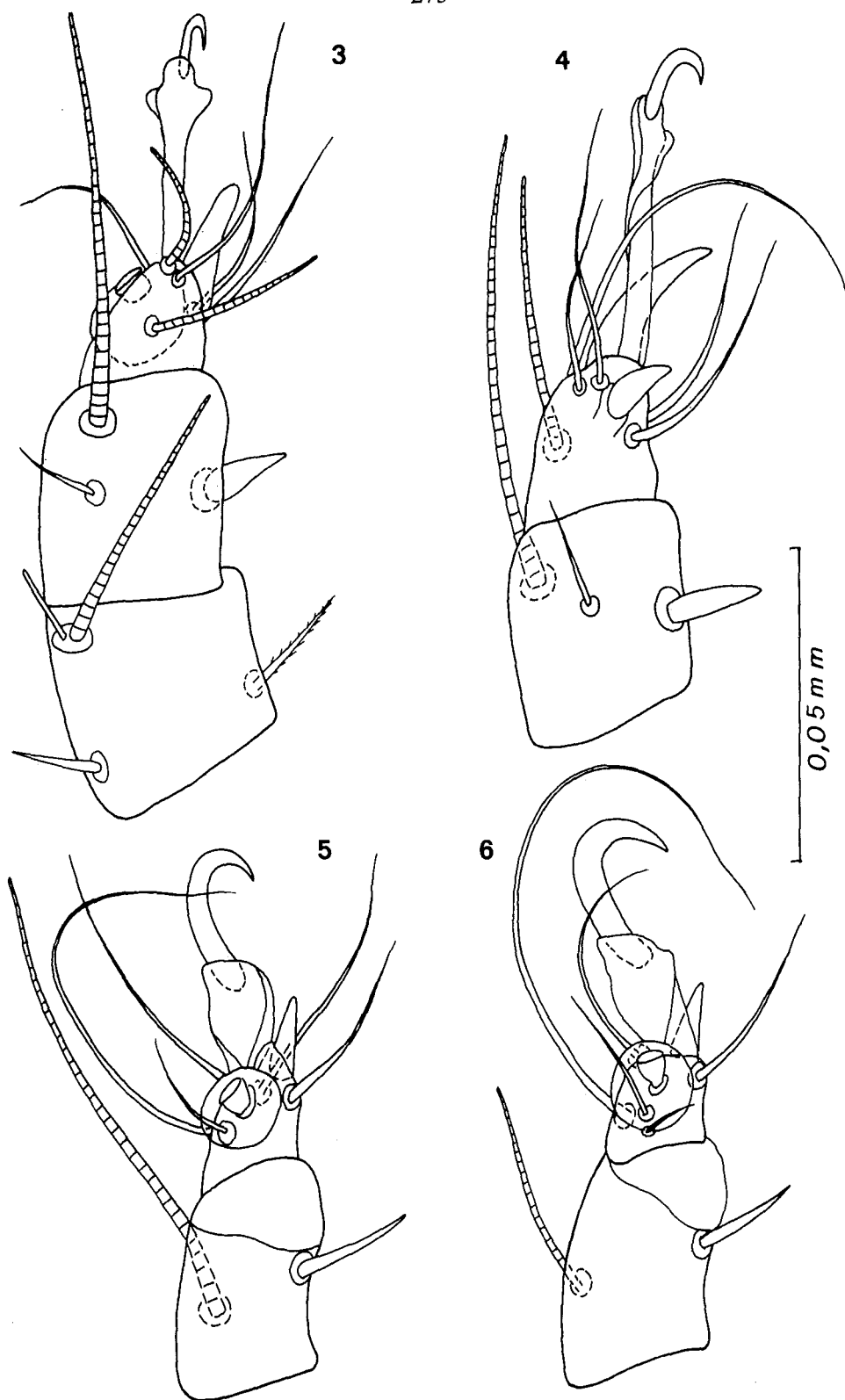
**Chaetotaxy** : (holotype and paratype) : Setae *vi* 100  $\mu$  ; *sc x* barbed, 80  $\mu$  ; *sc e* 125  $\mu$  ; *sc i* thin, 20-30  $\mu$  ; *d 1* very thin, 12  $\mu$  ; *d 2* thick 60  $\mu$  ; *d 3* thick, 72  $\mu$  ; *d 4* thick, 63  $\mu$  ; *d 5* absent ; *l 1*, *l 2*, *l 3* thin, 10 to 16  $\mu$  ; *l 4* 27  $\mu$  ; *l 5* 110  $\mu$  (with base not inflated) ; *h* 108  $\mu$  ; *sh* 18  $\mu$ . There is only one pair of anals (*a 3*) 25  $\mu$  long. There are two pairs of short genital setae. **Chaetotaxy of legs** : Tarsus I with a strong apical curved spine, 3 long simple setae and a blunt process. Tarsus II with one strong apical curved spine, one short apicobasal spine and 5 long simple setae.

Tarsi III-IV with 2 unequal curved spines and 5 simple setae. Tibia III-IV with a long thick seta finely attenuated apically. **Solenidiotaxy** : Tarsus I with  $\omega 1$  longer (30  $\mu$ ) than  $\omega 3$  (20  $\mu$ ). Genu I with *sigma 1* 12  $\mu$  and *sigma 2* 42  $\mu$  long.

**Females and immatures** : unknown.

**Remark** :

*A. costaricensis* differs from *A. glynni* (MANSOON, 1963) and *A. californica* FAIN & GANNING, 1979, by the structure of the hysteronotal shield without pits and by the shape of the dorsal setae



FIGS. 3-6 : *Amhyadesia costaricensis* sp. n. Holotype male : Tarsus, tibia and genu I dorsally (3) ; tarsus and tibia II (4) ; III (5) and IV (6).

not in the form of short and thick spines. *A. costaricensis* is close to *A. bermudana* FAIN & SCHUSTER and *A. atlantica* FAIN & SCHUSTER. It differs from *A. bermudana* by the presence of

only one pair of anal setae, the much shorter length of tarsi III and IV, the smaller length of the claws, the smaller length of some dorsal setae. (See table 1).

TABLE 1 : Principal measurements (in microns) in males of some *Amhyadesia* species.

LENGTHS :		<i>A. bermudana</i>	<i>A. atlantica</i>	<i>A. costaricensis</i>	<i>A. brasiliensis</i>
Idiosoma (length × width)		378-420 × 230-242	345 × 205	318-336 × 205-218	449-455 × 293-300
Tarsus	I	21	22	25	25
	II	29	25	25	27
	III	27	19	18	34
	IV	30	18	16	34
Claw	I-II	12	9	9	14-15
	III-IV	24	18	21	29-30
Setae	<i>vi</i>	80	105	90-100	135
	<i>sc e</i>	135	135	125	185
	<i>sc i</i>	24	30	20-30	48
	<i>d 1</i>	12-15	14	12	45
	<i>d 2</i>	60	60	60	90
	<i>d 3</i>	90-100	110	72	125
	<i>d 4</i>	93	150	63	150-160
	<i>l 4</i>	34	45	27	60
	<i>l 5</i>	135	150	110	180
	<i>sigma</i> 2	33	38	42	42
Solenidia	<i>sigma</i> 1	absent	5	12	absent

It is more close to *A. atlantica* but however differs from it by the following characters : setae *d 3*, *d 4*, *l 4* and *l 5* much shorter ; the setae *l 5* are not inflated basally and they are ventral and not terminal ; the solenidium *sigma 1* of genu I is relatively longer.

#### Localities :

Holotype from rocks, intertidal area of the Pacific coast, northern part of the National Park "Manuel Antonio", Quepos, Costa Rica, 26.9.1977, collecting locality CR-75 ; 2 paratypes males from a similar place, CR-73, in the southern part of the National Park, about 1 km far from CR-75, 25.9.1977.

#### Deposit of material :

Holotype in the collection of the Institut royal des Sciences naturelles de Belgique, Bruxelles, n° 26602 ; paratypes in the collections of the authors. All the types mentioned are mounted on microscopic slides.

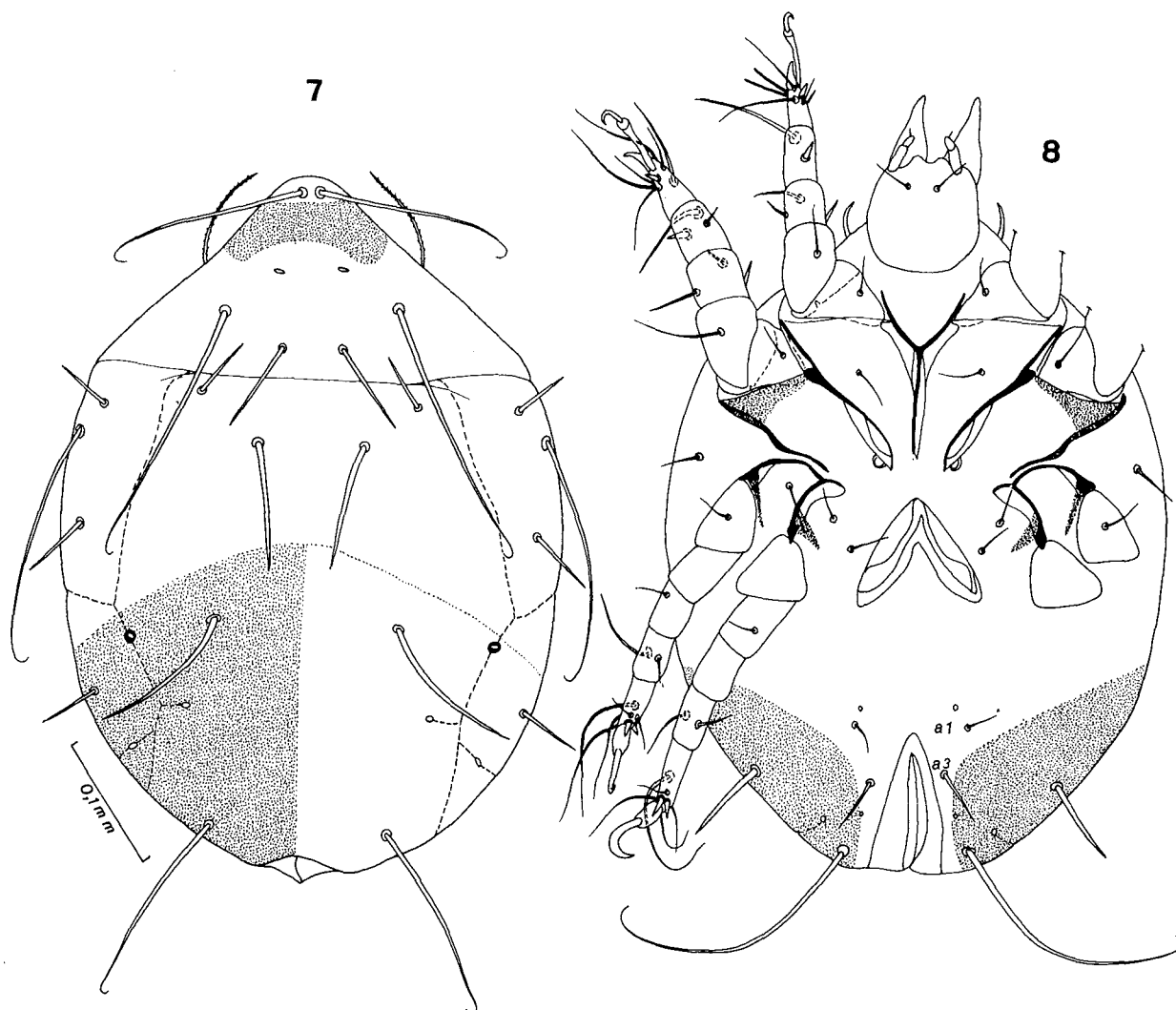
#### ECOLOGY :

*Distribution* : The types and several other specimens were found only in the upper part of the intertidal area.

*Nutrition* : Living animals showed mostly a dark greenish color of the body. It disappeared after a period of preservation in 70 %-alcohol. These observations and additional results which were obtained by investigations of the gut content of some specimens indicate that *A. costaricensis* is feeding on or at least partially on green algae. This feeding behaviour is already known from other hyadesiid species (SCHUSTER, 1979).

#### 2. *Amhyadesia brasiliensis* spec. nov.

*Female* (Figs. 7, 8, 11-14) : Holotype 510  $\mu$  long (idiosoma) and 375  $\mu$  wide. This specimen contains 2 eggs with a larva inside. In two paratypes : 495 × 330  $\mu$  (not ovigerous) and

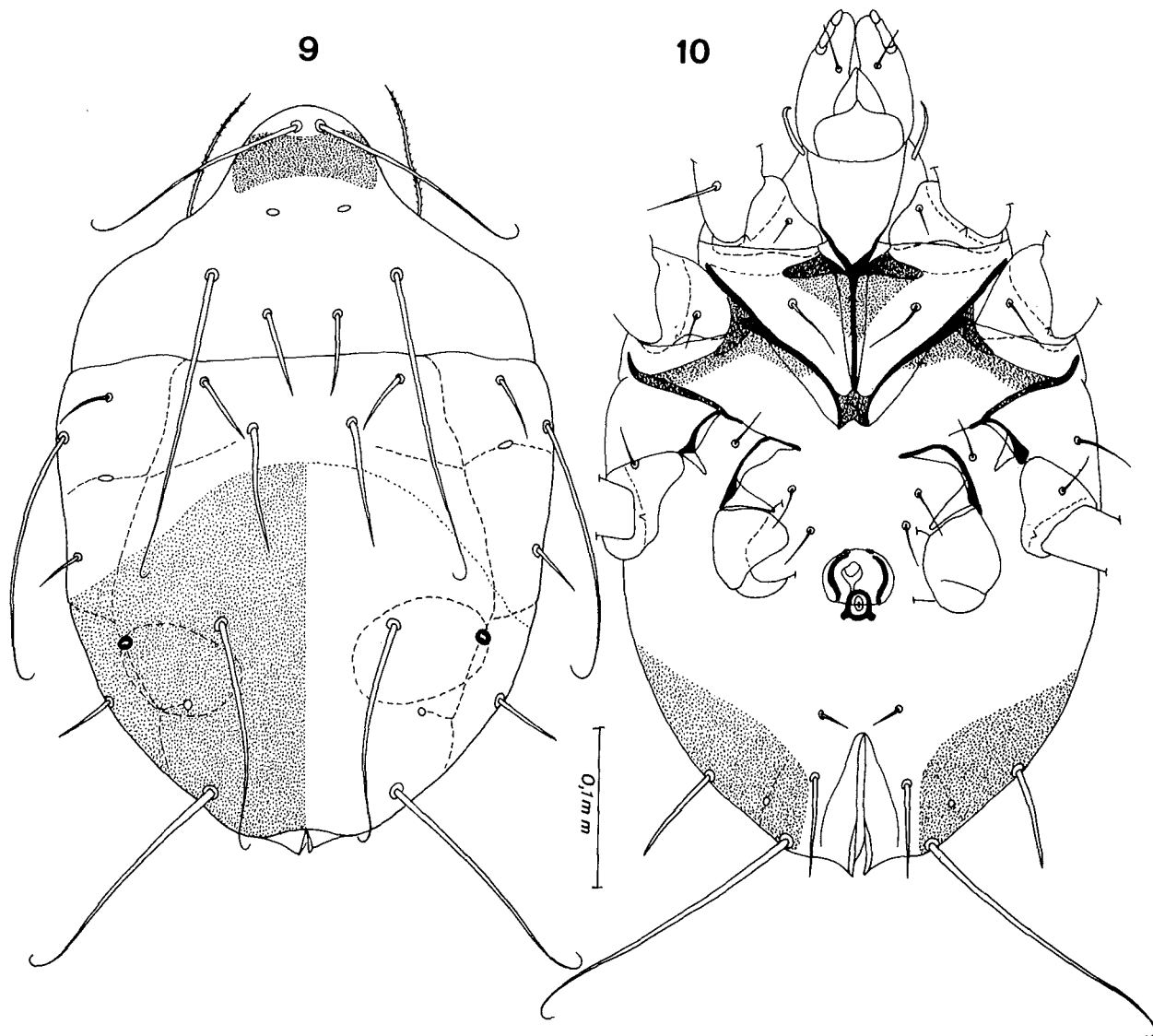


FIGS. 7-8 : *Amhyadesia brasiliensis* sp. n. Holotype female in dorsal (7) and ventral (8) view.

480 × 365  $\mu$  (containing 3 larvigerous eggs). *Dorsum* : Propodonotal shield 30  $\mu$  long (in mid-line) and 90  $\mu$  maximum width. Hysteronotum with a large punctate median shield extending ventrally. Sejugal furrow well developed. *Venter* : Sternum 75  $\mu$  long, free. Epimeres II free. Epimeres III-IV fused. There are two pairs of genital setae. Spermathecal sclerite relatively long. Copulatory pore not observed. *Legs* : Tarsi I-IV 30  $\mu$  — 33  $\mu$  — 45  $\mu$  — 50  $\mu$  long respectively. Claws I-II 15  $\mu$ , with a pretarsus 48  $\mu$  long ;

claws III-IV 30-33  $\mu$  long, pretarsus 18  $\mu$ . Gnathosoma 93  $\mu$  long (palps included) and 75  $\mu$  maximum width.

*Chaetotaxy* : Setae *vi* 145  $\mu$  ; *s cx* thick, barbed, 75  $\mu$  long ; *sc i* are cylindrical spines 60  $\mu$  long ; *sc e* 195  $\mu$  long ; *d 1* and *d 2* are cylindrical or cylindroconical spines 45  $\mu$  and 85  $\mu$  long respectively ; *d 3* 120  $\mu$  long ; *d 4* 150  $\mu$  ; *d 5* is missing ; *l 1*, *l 2*, *l 3* and *l 4* are spinous and 36  $\mu$ , 34  $\mu$ , 48  $\mu$  and 60  $\mu$  long respectively ; *l 5* 178  $\mu$  long ; *h* 180  $\mu$  ; *sh* thin 45  $\mu$ . There are two



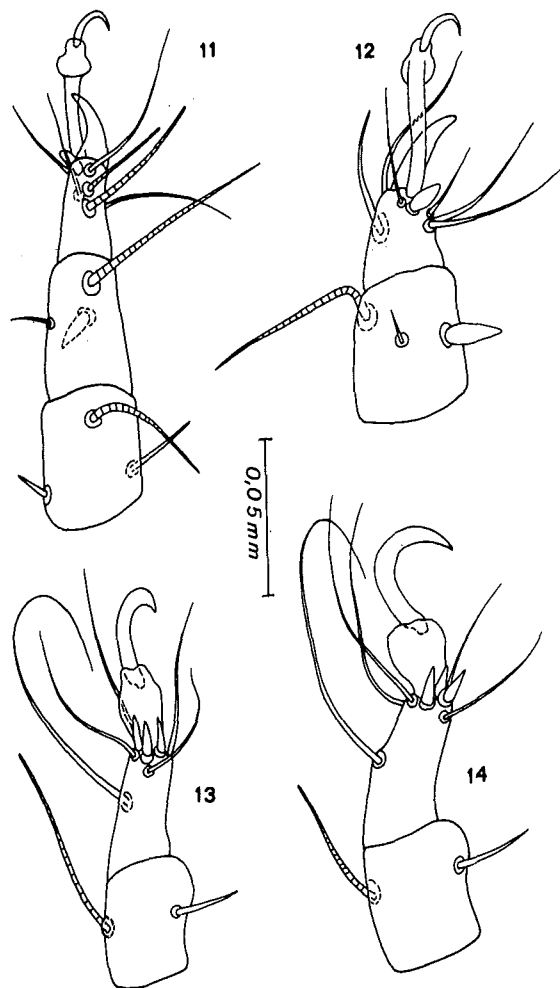
FIGS. 9-10 : *Amhyadesia brasiliensis* sp. n. Paratype male in dorsal (9) and ventral (10) views.

pairs of anal setae : *a* 1 30  $\mu$ , *a* 3 56  $\mu$ . The setae *v* *i*, *sc* *e*, *d* 3, *d* 4, *l* 5 and *h* are hooked at their apex.

*Chaetotaxy of legs* : number of setae as in the other species of genus. The ventral setae of tibiae III-IV are thin, finely attenuated spines. *Solenidiotaxy* : genu I with one solenidion.

*Male* (Figs. 9, 10, 15-18) : A paratype is 455  $\mu$  long and 293  $\mu$  wide. In another paratype 449  $\times$  300  $\mu$ . Cuticle as in female. *Dorsum* : Propodonal shield 25  $\mu$  long (in midline) and 80  $\mu$

wide. Hysteronotum completely punctate and sclerotized. *Venter* : Sternum and epimeres II either free or loosely united by punctate bands. Epimeres III-IV fused. Genital organ 37  $\mu$  wide with rounded lateral borders. Coxae I punctate only in their anterior part. *Legs* : Tarsi I-IV 25  $\mu$  — 27  $\mu$  — 34  $\mu$  — 34  $\mu$  long. Tarsi I, III and IV with a ventro-apical sucker, one apical claw and a blunt short subapical sclerotized process. Claws I-II 14-15  $\mu$  ; claws III-IV 29  $\mu$ . *Gnathosoma* : 85  $\mu$  long and 73  $\mu$  maximum



FIGS. 11-14 : *Amhyadesia brasiliensis* sp. n. Holotype female : Tarsus, tibia and genu I dorsally (11) : tarsus and tibia II (12), III (13) and IV (14).

width. *Chaetotaxy* : as in the female. *Leg chaetotaxy* : Number of setae as usual for the genus. The ventral setae of tibiae III-IV are spinous. *Solenidiotaxy* : Genu I with only one solenidion.

*Tritonymph* : Length 362  $\mu$ , width 270  $\mu$ . Resembling the female except that the vulva and the copulatory canal is missing. *Chaetotaxy* as in the adults but setae shorter and thinner. The two pairs of genital setae are present.

*Protonymph* : Length 300  $\mu$ , width 220  $\mu$ . Similar to the tritonymph but the setae are shorter and thinner and some are lacking (e.g. trochanticals I-III).

*Larva* : unknown.

#### Remark :

This species differs from *A. glynni* and *A. californica* by the non-pitted aspects of the hysterosomal shield, by the presence of only two pairs of genital setae, by the presence of only one solenidion on genu I (in both sexes) by the shape of setae *sc i*, *d 1* and *d 2* forming long cylindric-apical spines. It differs from *A. bermudana*, *A. atlantica* and *A. costaricensis* by the greater size of the tarsi especially the posterior tarsi, the much greater size of the claws, the aspect of setae *sc i* and *d 1* which are long and strong spines.

#### Localities :

Holotype and 1 paratype female from BS-39 : Intertidal area, rocky coast at the Biological Station to the south of São Sebastião, 27.7.1960. — Other paratypes from : BR-142 (about 5 m far from BS-39, 30.8.1960), 1 male, 2 females, 4 tritonymphs, 1 protonymph ; BR-255 (about 20 m far from BS-39, 15.2.1961), 6 males, 26 females, 7 tritonymphs ; BR-106 (Santos, Ilha Urubuesaba, 8.8.1960), 5 males, 3 females, 10 tritonymphs, 1 protonymph ; BC-07/09 (Itanhaen, 17.6.1960), 1 female. — All the localities are situated along the coast of São Paulo State, Brazil.

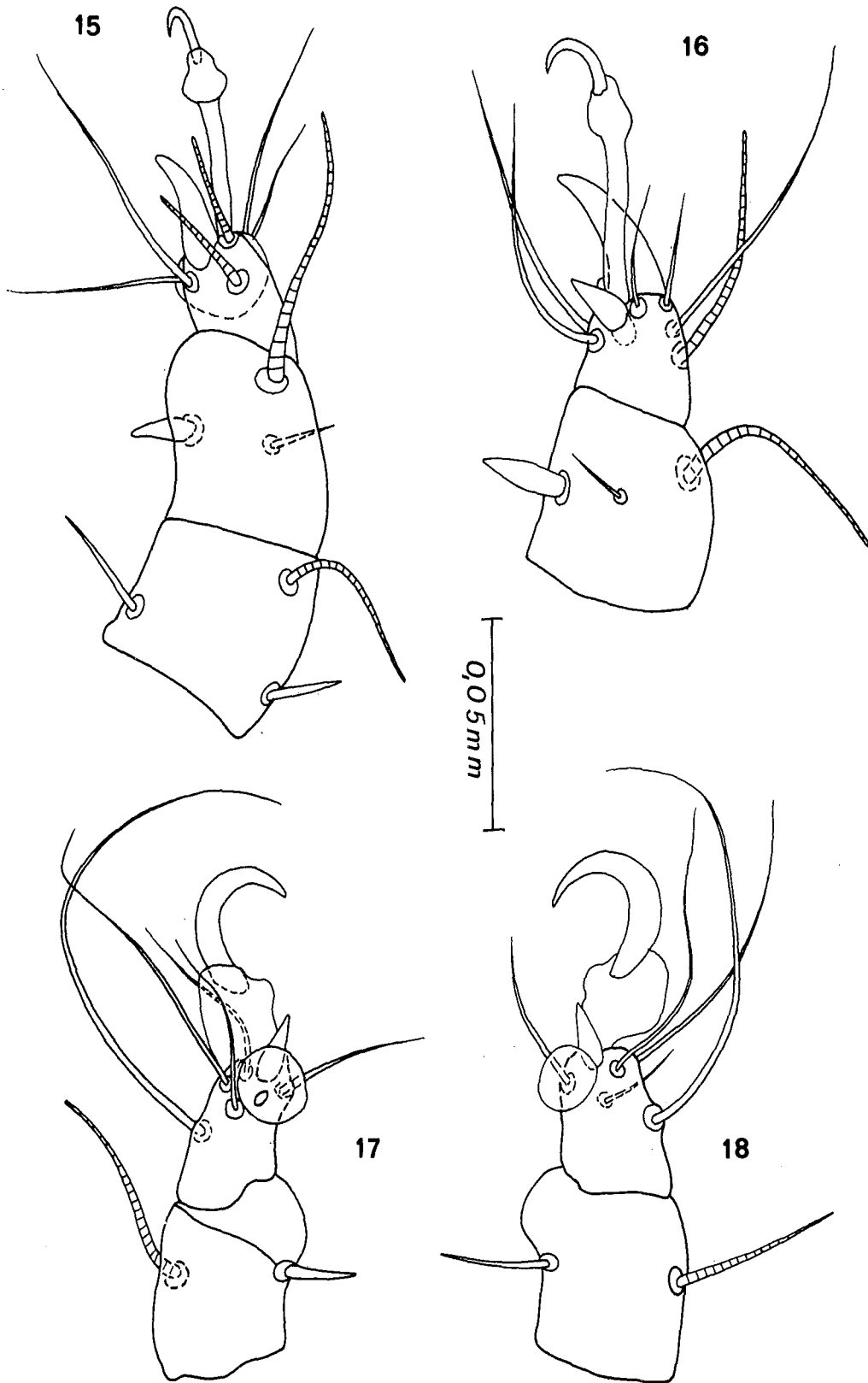
#### Deposit of material :

Holotype, 1 paratype male, 2 paratypes females and 2 paratypes tritonymphs (BR-255) in : Institut royal des Sciences naturelles de Belgique Bruxelles, Nr. 26603 ; 1 paratype male and 1 paratype female (BR-255) in : Naturhistorisches Museum Wien, Nr. 11848, 11849 ; 1 paratype male and 1 paratype female (BR-255) in : Museum nationale Histoire naturelle, Paris, Nr. 57 E 16 ; 1 paratype male and 1 paratype female (BR-255) in : Zoologisches Institut und Museum, Universität Hamburg, Nr. A 13/83, A 14/83 ; rest of material in the collections of the authors.

#### ECOLOGY :

*Distribution* : *Amhyadesia brasiliensis* is an intertidal species with a preference for the upper





FIGS. 15-18 : *Amhyadesia brasiliensis* sp. n. Paratype male : Tarsus, tibia and genu I dorso-laterally (15) ; tarsus and tibia II (16) ; III (17) IV (18).

half of the tidal area. She inhabits various formations of the Brazilian rocky coast, especially substrata which are rich in narrow crevices as upgrowth of chthamalids, balanids, oysters and calcareous polychaetes, but she is also living in algae zones, e.g. in turfs of *Bostrychia* (SCHUSTER, 1962, p. 398 ; in this publication *A. brasiliensis* is named "*Hyadesia curassaviensis*"). The hyadesiids were extracted from the substrata by using Berlese-Tullgren-funnels. The highest concentration of individuals was found in the chthamalid zone : 64 ind. per  $10 \times 10$  cm upgrowth.

*Nutrition* : The body of living animals, occasionally observed in the biotope, has frequently a greenish glow. In these cases the gut content consists of a bright green substance mixed with rests of thalli, blue-green algae and rarely diatoms. That leads to the assumption that green algae play an important role in the diet of *Amhyadesia brasiliensis*. With that a strong similarity exists in the feeding habit to *A. costaricensis*.

#### REFERENCES

- FAIN (A.), 1981. — Notes on the Hyadesiidae HALBERT, 1915 and Algophagidae FAIN, 1974, nov. tax. (Acari, Astigmata) with a redescription of *Hyadesia curassaviensis* VIETS, 1936 and *H. sellai* VIETS, 1937. — *Acarologia* **22** (1) : 47-61.
- FAIN (A.) & GANNING (B.), 1979. — *Amhyadesia californica* g. n., sp. n. (Acari, Astigmata, Hyadesidae) from the southern Californian coast. — *Intl. J. Acar.*, **5** (2) : 139-142.
- FAIN (A.) & SCHUSTER (R.), 1983. — New Astigmatic Mites from the Coastal Area of Bermuda Islands. — *Entomol. Mitt. Zool. Mus. Hamburg*, **7** (119) : 417-434.
- SCHUSTER (R.), 1962. — Das marine Litoral als Lebensraum terrestrischer Kleinarthropoden. — *Int. Revue ges. Hydrobiol.*, **47** (3) : 359-412.
- SCHUSTER (R.), 1979. — Soil mites in the marine environment. — *Recent Advances in Acarology*, **1** : 593-602.

*Paru en octobre 1984.*

