Entomol. Mitt. zool. Mus. Hamburg Bd. 6 (1979) Nr. 105

Halacaridae (Acari) from Oahu Island (Hawaiian Archipelago)

ILSE BARTSCH

(With 29 figures)

Introduction

At present the halacarid fauna from Pacific Islands in the warm water region is poorly known. To date only three publications have dealt with marine mites. A parasitic living halacarid, *Copidognathus matthewsi,* is known the Hawaiian Islands (NEWELL 1956). Two species, *Agaue* sp. and *Scaptognathus* sp., have been recorded from the Solomon Islands (CHALLIS 1969). The fauna in intertidal beaches of the Galapagos Islands is well known, 42 species have been found here (BARTSCH 1977).

In 1977 Dr.R. RÖTTGER took some samples in intertidal sandy beaches on Oahu Island in the Hawaiian archipelago. Four halacarid species were found: *Actacarus pacificus* n.sp., *Copidognathus* sp. A, *Acarochelopodia* sp. A, and *Scaptognathides* sp. A.

Descriptions

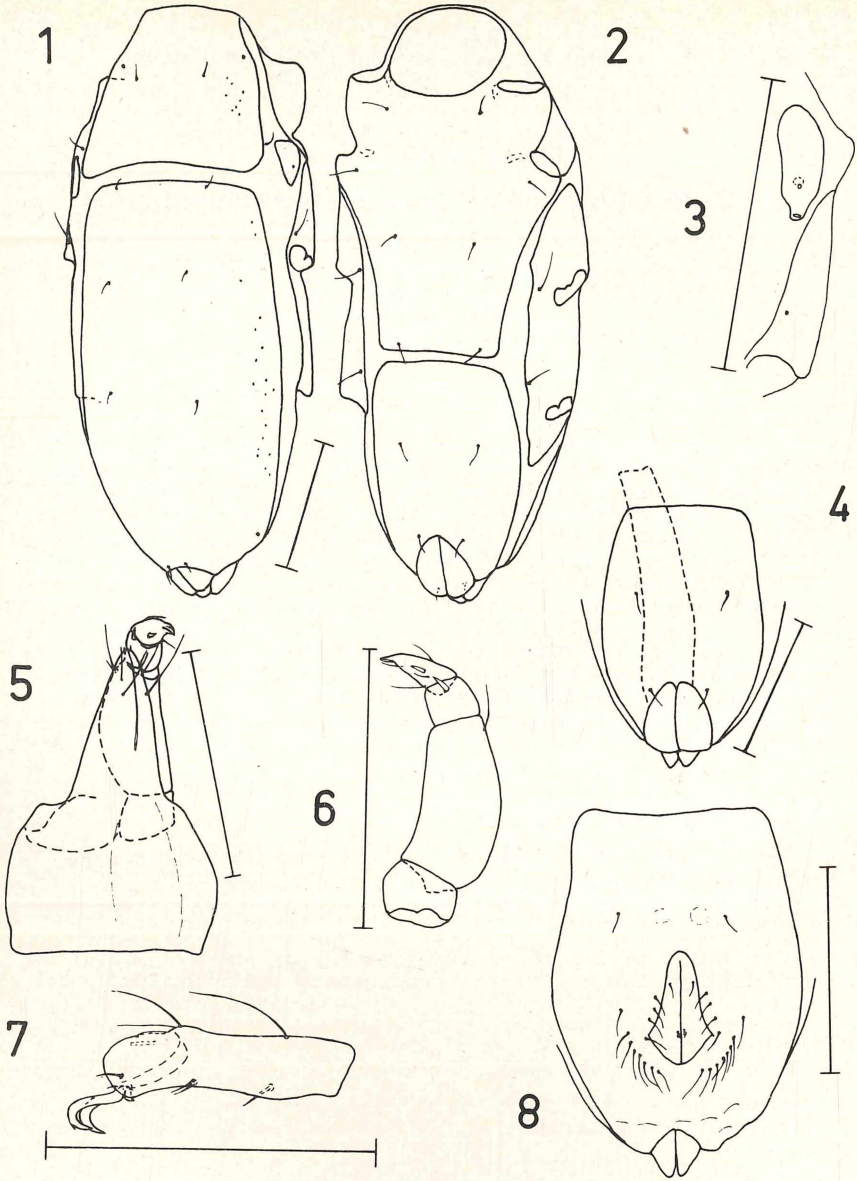
Actacarus pacificus n.sp. (Figs. 1 - 14)

Material examined: Two females, one male, three deutonymphs, two protonymphs, one larva.

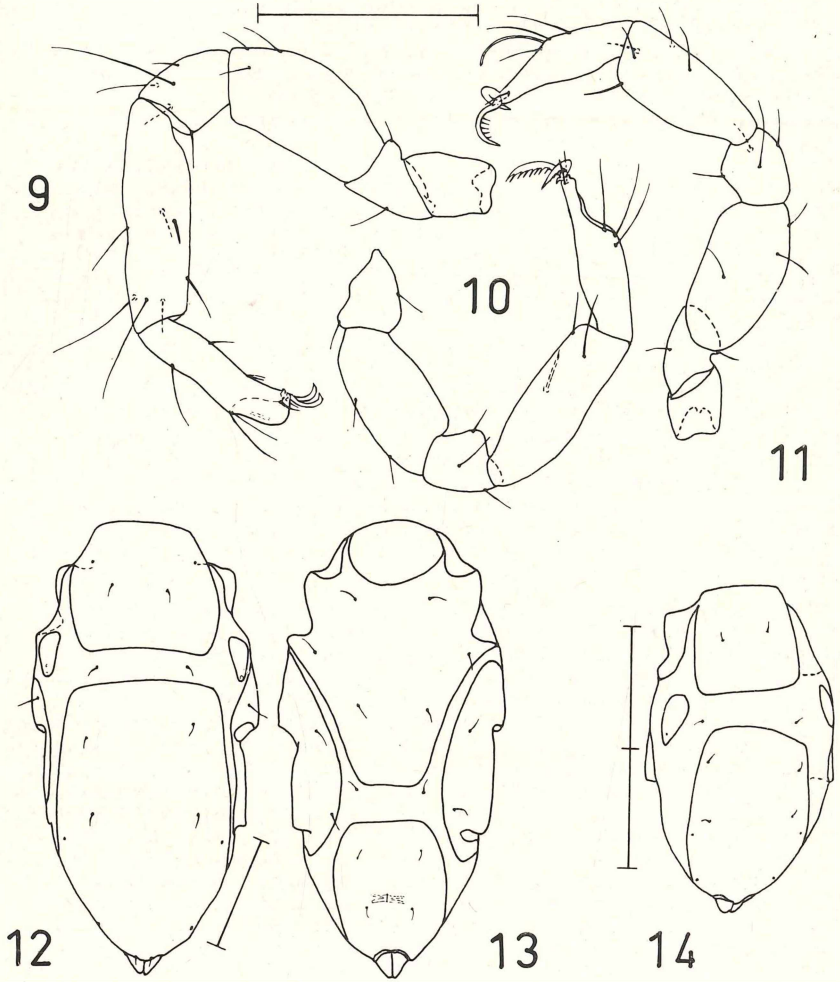
Holotype: One female, deposited in Zoologisches Institut und Zoologisches Museum, Hamburg.

F e m a l e: Length of idiosoma 222 µm and 225 µm. In the holotype the following measurements were obtained (in µm):

	length	width		length	width
idiosoma	225	98	genitoanal plate	88	59
anterodorsal plate	59	70	genital opening	21	24
ocular plate	18	10	capitulum	67	45
postdorsal plate	148	80	rostrum	34	19
anterior epimeral plate	98	88			



Figs. 1-8: *Actacarus pacificus* n.sp. — 1 idiosoma, ♀, dorsal view; 2 idiosoma, ♀, ventral view; 3 ocular plate, ♀, dorsal view; 4 genitoanal plate, ♀, ventral view; 5 capitulum, ♀, ventral view; 6 palp, ♀, medial view; 7 tarsus I, ♀, lateral view; 8 genitoanal plate, ♂, ventral view. (Each division = 50 µm).



Figs. 9-14: *Actacarus pacificus* n.sp. — 9 leg I, ♀, lateral view; 10 leg III, ♀, lateral view; 11 leg II, ♀, lateral view; 12 idiosoma ♂, deutonymph, dorsal view; 13 idiosoma, deutonymph, ventral view; 14 idiosoma, larva, dorsal view.

Dorsal and ventral shields separated by narrow, finely striated integument. Dorsal plates uniformly punctate; in marginal areas fine canaliculi visible (fig. 1). First pair of dorsal setae (ds-1) on anterodorsal plate, posterior the first pairs of pores. Ds-2 insert at border of anterodorsal plate at level of trochanter II. Ds-3, ds-4, ds-5 and ds-6 on postdorsal plate; ds-3 at the anterior margin of the plate, ds-4 at level of trochanter III and ds-5 at level of trochanter IV. In *Actacarus pacificus* ocular plates well developed (figs. 1, 3).

Ventral plates porose, similar to dorsal shields. Anterior epimeral plate with four pairs of delicate setae (fig. 2). Three pairs are inserted as known from other *Actacarus* species, the fourth pair is placed at posterior border of the plate. Posterior epimeral plates with three pairs of setae, one dorsally and two ventrally. On genitoanal plate, anterior to genital opening, stand two pairs of perigenital setae; besides these a third pair seems to be present between genital sclerites and anal papillae. Ovipositor longer than genitoanal plate (fig. 4).

Rostrum triangular, reaching to middle of third papal segment (fig. 5). The two long maxillary setae inserted far distally on the rostrum. Epistome truncate. Palpal chaetotaxy (fig. 6) similar to other *Actacarus* species.

Chaetotaxy of legs as illustrated in figures 9 to 11. Claws on tarsus I small compared with those on the following legs. Claws on leg I with an accessory tooth but without comb. Median claw present (fig. 7). Claws on legs II - IV with well developed combs and accessory teeth.

M a l e: Length of idiosoma 217 µm. Resembling females except in characters of genitoanal plate. Genital opening flanked by 12 pairs of perigenitalsetae, and anterior to genital opening a pair of isolated setae. On genital sclerites three pairs of minute subgenitalsetae (fig. 8).

J u v e n i l e s: Length of idiosoma in deutonymphs 183-207 µm, in protonymphs 162 - 175 µm and in larva 136 µm. Dorsal and ventral plates separated by wider bands of striate integument than in adults. In all three juvenile stages third pair of dorsal setae between anterodorsal and postdorsal plate within membranous area (figs. 12, 14). In deutonymphs fourth pair of ventral setae in membranous area between anterior epimeral plate and genitoanal plate (fig.13). In protonymphs and larvae this pair of ventral setae absent. In deutonymphs genitoanal plate with two pairs of perigenital setae; below primordial genital slit two pairs of genital suckers (fig. 13). In protonymphs genitoanal plate with one pair of genital suckers, but no perigenital setae.

R e m a r k s: The adults of *Actacarus pacificus* are easily distinguished from other species known at present by the four pairs of setae on the anterior epimeral plate.

Copidognathus sp. A (Figs. 15 - 24)

Material examined: One protonymph.

P r o t o n y m p h: In this single specimen, the following measurements were obtained (in µm).

	length	width		length	width
idiosoma	230	142	anterior epimeral plate	71	130
anterodorsal plate	89	72	genital plate	56	59
ocular plate	47	38	capitulum	67	
postdorsal plate	146	99	rostrum	32	

Dorsal plates with areas of elaborate rosette pores (fig. 15). Between these areas dorsal plates panelled (fig. 24); the panels again are subdivided. Anterodorsal plate produced anteriorly. On the plate there are three large areas with rosette pores, an anterior elongate and two posterior circular ones. First pair of dorsal setae on anterior border of posterior rosette pore area (fig. 15). Second and third pair of dorsal setae (ds-2, ds-3) in membranous integument; ds-2 between anterodorsal plate and ocular plate, ds-3 between anterodorsal and postdorsal plate. Fourth and fifth pair of dorsal setae on postdorsal plate. Postdorsal plate with two costae, two rosette pores wide.

Ventral plates with rather coarse pores. Marginal parts of posterior epimeral plate characterised by rosette pores with a wide ostium. Chaetotaxy of ventral plates as illustrated in figure 16.

Capitulum short. Palpi hardly extending beyond tip of rostrum. Second palpal segment with a dorsal seta. Fourth segment short, with three setae basally and a delicate one at the tip (figs. 21, 22).

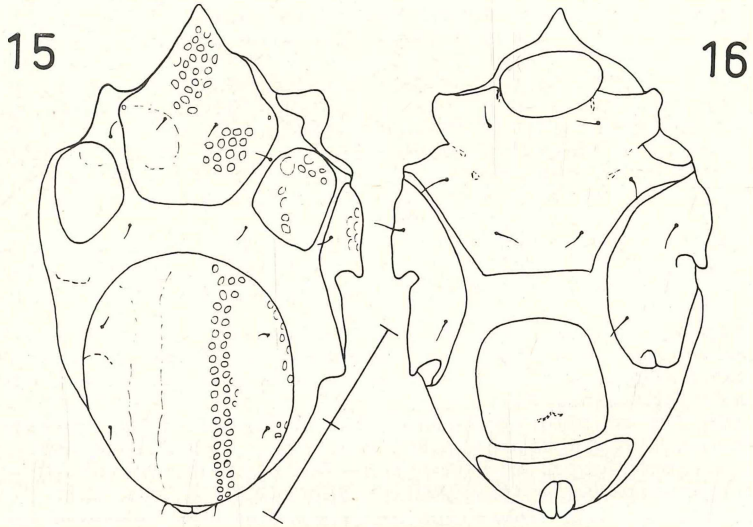
Leg I thickened. Telofemur I with marked spinelike projections; ventrolaterally there are two such spines and an angular projection at the end of the segment, ventromedially there is one spine (fig. 17). Tibia I with a long spine on a ventromedial and ventrolateral lamella; these lamellae extend as angular projections beyond distal end of tibia. Segments 3 and 4 on legs I, II and III also with ventrolateral and ventromedial lamellae and distal angular projections. Claws on leg I with an accessory tooth (fig. 20). Claws on tarsi II - IV with longitudinal combs (fig. 21).

R e m a r k s: The spines and carinae on telofemur and tibia I resemble leg I in the genus *Atelopsalis*. But shape of capitulum and chaetotaxy of legs indicates this species is a true *Copidognathus*.

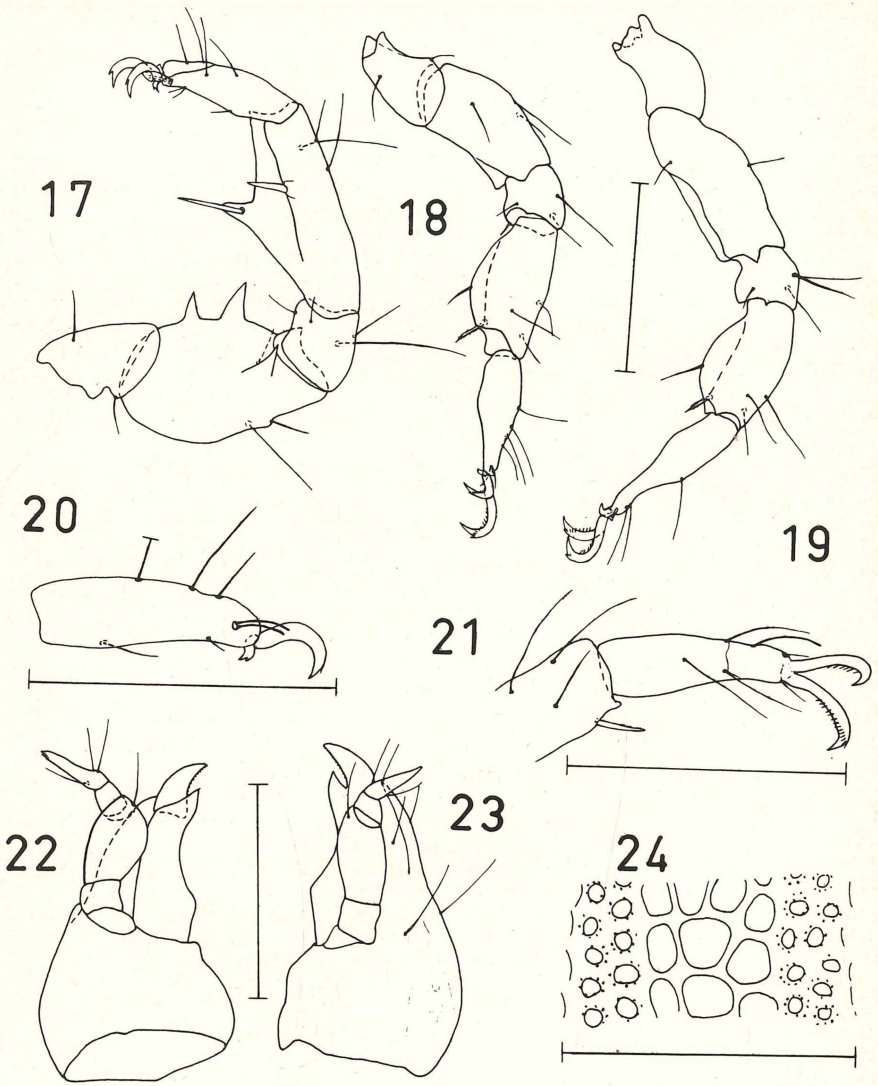
The process on anterodorsal plate and the long spines on tibia I in *Copidognathus* sp. A closely resembles *Copidognathus spinulus* (TROUESSART, 1899). But in *C.spinulus* telofemur with-

out spinelike carinae and costae on postdorsal plate swollen laterally at level of leg IV, while in *Copidognathus* sp. A this is not found.

Copidognathus pseudosetosus (NEWELL, 1949) also has an anterodorsal plate with an anterior process, but obviously these two species are not closely related.



Figs. 15-16: *Copidognathus* sp. A, protonymph — 15 idiosoma, dorsal view; 16 idiosoma, ventral view.



Figs. 17-24: *Copidognathus* sp. A, protonymph – 17 leg I, medial view; 18 leg II, lateral view; 19 leg IV, lateral view; 20 tarsus I, lateral view (medial setae omitted); 21 tarsus II, dorsal view; 22 capitulum, lateral view; 23 capitulum, lateral view; 24 part of postdorsal plate at level of ds-4.

Acarochelopodia sp. A (Figs. 25 - 28)

Material examined: One deutonymph and one larva.

D e u t o n y m p h: Length of idiosoma 165 µm. All dorsal plates finely punctate. Anterodorsal plate rounded, with a pair of pores and a pair of minute dorsal setae (ds-1). Ocular plates ovate. Postdorsal plate short, rounded. Second, third and fourth pairs of dorsal setae within membranous area, fifth pair of dorsal setae on anterior margin, adanal setae on posterior margin of postdorsal plate (fig. 26).

Anterior epimeral plates divided medially by striated integument, distally drawn out into a sharp tail, which extends to level of trochanter III. Posterior epimeral plate divided by a longitudinal band of striated integument. Ventral part of posterior epimeral plate with two setae, lateral plate with one dorsal seta (fig. 27).

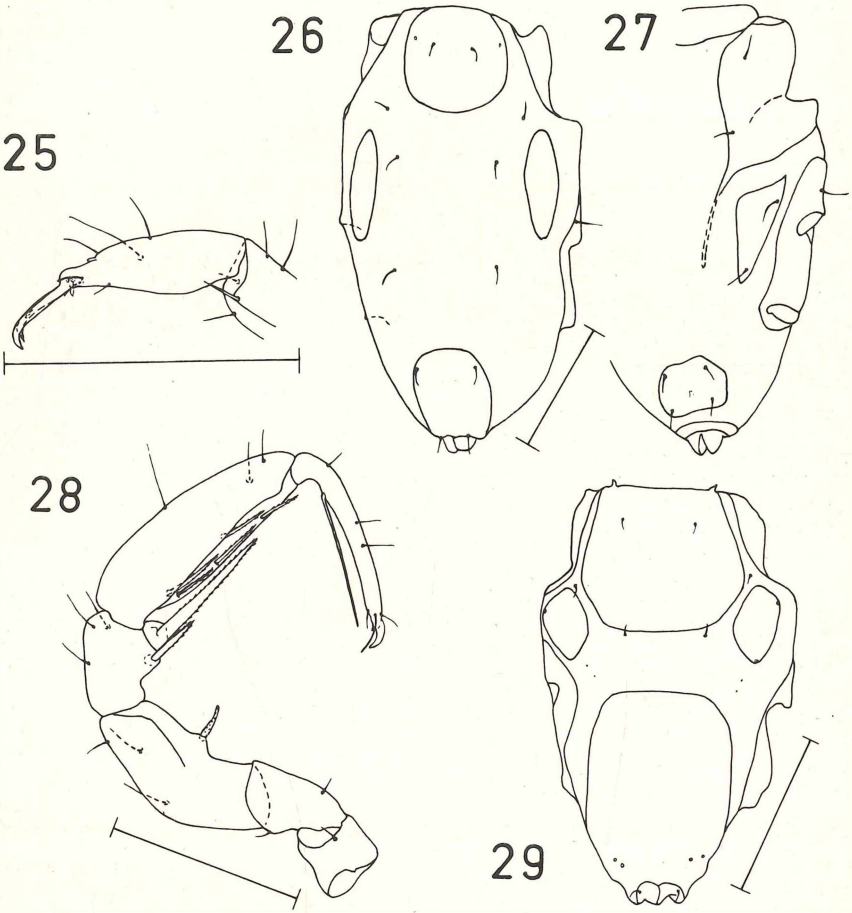
Capitulum short, palpi small. Second palpal segment with two dorsal spines, the distal one broad and as long as the fourth palpal segment. Third palpal segment minute, with a broad dorsal seta. Fourth palpal segment short, with three basal setae.

Telofemur I ventrally with a slightly bent, echinulate spine (fig. 28). On genu I a short ventromedial and a long ventrolateral pectinate spine. On tibia I two ventromedial and three ventrolateral pectinate spines, inserted on the inside of a medial and lateral carina. Tarsus I long and slender, with a long ventral spine and three dorsal setae, inserted as shown in fig. 28. Distally at the tip of tarsus two delicate setae and a medial flagellum. At tip of tarsus I a minute claw. In the middle of the claw a small dent is visible. Tarsi II, III and IV each with two distinct, but slender claws and a minute median claw. (fig. 25).

R e m a r k s: *Acarochelopodia* sp. A in a number of characters closely resembles *A.aduncispina* (BARTSCH, 1977). In both species the posterior epimeral plates are subdibided by longitudinal bands of striate integument; tibia I in deutonymphs with three ventrolateral and two ventromedial pectinate spines; tarsi II, III and IV with two distinct claws and a minute median claw. But *Acarochelopodia* sp. A from Oahu Island differs from *A.aduncispina* in a few characters. In *Acarochelopodia* sp. A the posterior part of anterior epimeral plate is drawn out into a tail, while in *A.aduncispina* this plate is rounded. In *Acarochelopodia* sp. A the echinulate spine on telofemur I is not curved as much as in *A.aduncispina*. In *Acarochelopodia* sp. A tarsus I has no ventral setae at level of the two distodorsal setae as in *A.aduncispina*.

Scaptognathides sp. A (Fig. 29)

Material examined: One protonymph.



Figs. 25-28: *Acarochelopodia* sp. A, deutonymph — 25 tarsus II, medial view; 26 idiosoma, dorsal view; 27 idiosoma, ventral view; 28 leg I, medial view.

Fig. 29: *Scaptognathides* sp. A, protonymph — 29 idiosoma, dorsal view.

P r o t o n y m p h: In the single protonymph found the following measurements were obtained (in µm):

	length	width		length	width
idiosoma	127	72	anterior epimeral plate	49	72
anterodorsal plate	44	50	genitoanal plate	53	33
ocular plate	23	16	capitulum	64	
postdorsal plate	64	49			

Anterodorsal plate large and rectangular, with a pair of pores projecting from the anterior margin of the plate. First pair of dorsal setae inserted on anterodorsal plate, second and third pair within membranous area, adanalsetae on genital papillae (fig. 29). Position of fourth and fifth pair of dorsal setae was not detectable in this specimen. Ocular plate with a pore in the anterolateral angle. Postdorsal plate longer than anterodorsal plate, truncate anteriorly; with two pairs of pores, standing close together on the posterior part of postdorsal plate.

Capitulum similar to other *Scaptognathides* species. Rostrum slender. Two-segmented palpi slightly extending beyond rostrum. Palpi distally with four short, blunt spines.

Claws on leg I with the typical umbrella-like comb.

R e m a r k s: Till now only two species of *Scaptognathides* were known, *Sc.planus* MONNIOT, 1972 in gravel off Bermuda and *Sc.bicornis* BARTSCH, 1977; a common species in intertidal sandy beaches of the Galapagos Islands. *Sc.planus* is easily recognized by the ornamentation of dorsal shields, while in *Sc.bicornis* and *Scaptognathides* sp. A from Oahu Island the plates are porose. *Scaptognathides* sp. A can be distinguished from *Sc.bicornis* by the larger ocular plates and the two pores close together on the posterior part of postdorsal plate.

On European coast, *Scaptognathides* has not yet been found, though these areas have been fairly thoroughly examinized. The Pacific may be the main area of distribution for this genus.

Acknowledgement

To Drs R. RÖTTGER (Kiel) and P. SCHMIDT (Aachen) I am indebted for entrusting me these mites collected on Oahu Island.

Summary

In intertidal sandy beaches on the Island Oahu in the Hawaiian archipelago four halacarid species were found: *Actacarus pacificus* n. sp., *Copidognathus* sp. A, *Acarochelopodia* sp. A, and *Scaptognathides* sp. A. All four species are described.

Zusammenfassung

In Gezeitenständen der Insel Oahu (Hawaii-Inseln) wurden die vier Halacariden-Arten *Actacarus pacificus* n. sp., *Copidognathus* sp. A, *Acarochelopodia* sp. A und *Scaptognathides* sp. A gefunden. Die vier Arten werden beschrieben.

Literature

BARTSCH, I., 1977: Interstitielle Fauna von Galapagos. XX. Halacaridae (Acari).- Mikrofauna Meeresboden, *65:* 1-108. Mainz.

CHALLIS, D.A., 1969: An interstitial fauna transect of a Solomon Islands sandy beach.- Phil.Trans.R.Soc., B, *255:* 517-526. London.

MONNIOT, F., 1972: *Scaptognathides,* un nouveau genre d'acariens marins (Halacaridae) dans l'Atlantique ouest.- Acarologia, *13:* 361-366. Paris.

NEWELL, I., 1956: A parasitic species of *Copidognathus* (Acari: Halacaridae).- Proc.Hawaii.Ent.Soc., *16:* 122-125. Honolulu.

Present address:

Dr.ILSE BARTSCH, Biologische Anstalt Helgoland, Palmaille 9, 2000 Hamburg 50, GFR.