

Neohyadesia signyi (HYADESIDAE : ACARINA): A NEW GENUS AND SPECIES
FROM SIGNY ISLAND, SOUTH ORKNEY ISLANDS

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SPECIMENS of *Neohyadesia signyi* n. gen., n. sp. were found by B. J. A. Goodman in a series of small pools of fresh to brackish water situated on a promontory at Paal Harbour, Signy Island. In all, seven specimens were collected and these consisted of one male, two females, one resting protonymph, one protonymph and two larvae. Three of the six pools studied contained specimens of the mite. The pools were subject to marine influence from spray and chloride concentration was about 150 mg./l. on average, although this could vary widely. Copepoda, Anostraca, Nematoda, Rotifera and Tardigrada were also found in the pools, as well as blue-green and green filamentous Algae. In some places the pools had mossy banks and the bottom consisted of a mat of semi-decayed vegetable matter.

DESCRIPTION

Holotype (male) (Fig. 1). Length of idiosoma: 550 μ m.

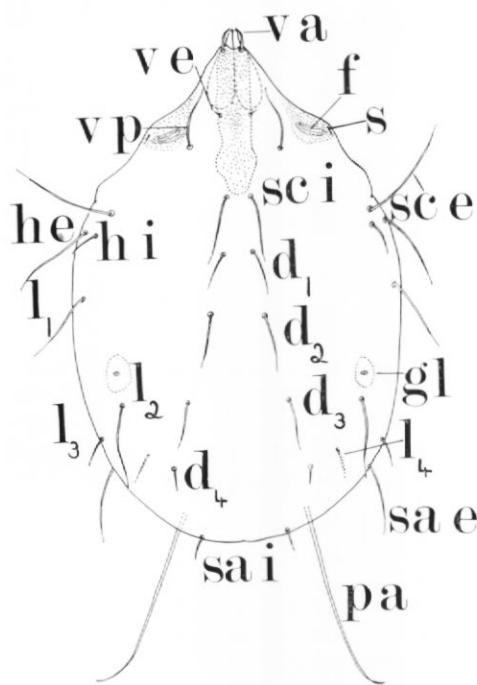


Fig. 1. *Neohyadesia signyi*. Male. Dorsal view.

f supracoxal fossa; *s* supracoxal seta; *va*, *ve*, *vp*, *sci*, *sce*, *hi*, *he*, *l1* to *l4*, *d1* to *d4*, *sae*, *sai*, *pa* setae of the idiosoma; *gl* opening of latero-abdominal gland.

The idiosoma is soft, easily distorted from its natural shape and without any transverse constriction between propodosoma and hysterosoma; it is prolonged forward as a rostrum which almost conceals the gnathosoma. The cuticle is smooth with only slight indications of scale-like markings. A narrow dorsal propodosomal shield is present extending to the bases of the second pair of legs; midway along its lateral edges are the short vertical external setae *ve*. The cuticle of this shield and also the legs is slightly tanned and its surface is pitted. Above

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the bases of legs I is the supracoxal fossa (*f*) encircled by a sclerite, and at the external edge of this arises a short, smooth supracoxal seta, *s*.

Ventrally (Fig. 2), the apodemes of legs I meet to form a sternum, those of legs II to IV are free. The coxal regions are unthickened and the usual coxal setae are present on coxae I and III (*cx*₁ and *cx*₃).

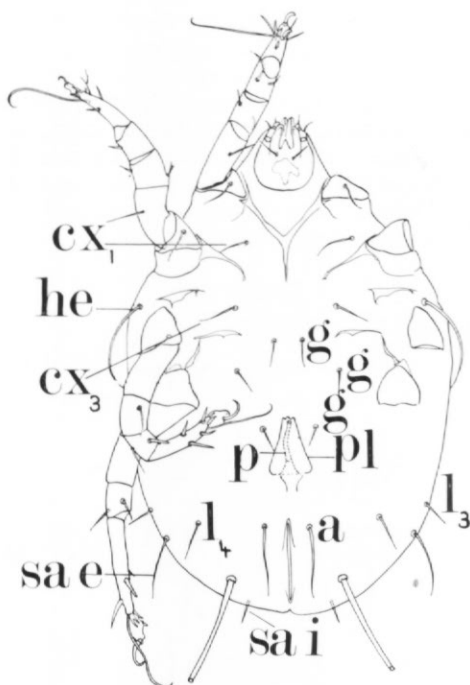


Fig. 2. *Neohyadesia signyi*. Male. Ventral view.
*cx*₁, *cx*₃, *g*, *l*₃, *l*₄, *sae*, *sai*, *a*, *he* setae of the idiosoma; *pl* genital plate; *p* penis.

The gnathosoma is unusually small and almost invisible when viewed from the dorsal aspect. The chelicerae are dentate, with a number of small "teeth" on fixed and movable digits.

The dorsal setae are smooth and arranged as shown in Fig. 1. The vertical anterior (or internal) setae *va* are situated at the apex of the idiosoma and curve downwards so as to cover the tips of the chelicerae. The vertical posteriors *vp* arise on either side of the dorsal prodorsal shield and are longer than *va*. The internal scapulars *sci* arise nearer to each other than to the external scapulars *sce*, and behind them are the four pairs of dorsals *d*₁ to *d*₄. The distance between the *d*₄ setae is more than twice that between the *d*₁ setae. The external humeral setae *he* are considerably longer than the internal *hi*, and the ventral humerals are missing as in the genus *Algophagus* (Hughes, 1955). Four pairs of laterals *l*₁ to *l*₄ are present, *l*₁ arising in front of the latero-abdominal gland; *l*₄ are ventral in position. The external sacrals *sae* are close to *l*₄ and the shorter internal sacrals *sai* are terminal and are inserted close to the long post-anal setae *pa*. Only one pair of anal setae, *a*, flanks the anal opening and of the three pairs of genitals *g* (Fig. 2) two pairs are in front of the genital opening. Table I gives the lengths of the shorter setae in male, female and protonymph.

The genital opening is behind coxae IV and concealed by a triangular plate (*pl*) hinged at its posterior end (Fig. 2); the free anterior edge is tripronged. The penis (*p*) is a sinuous tube, the opening directed forwards. No genital sense organs are present in either sex.

Every leg ends in a membranous pretarsus terminating in a claw. Table II shows the chaetotactic formula for the adults using the terminology of Grandjean (1939). The figures in

TABLE I. LENGTHS OF DORSAL SETAE (μm .)

	<i>vp</i>	<i>sci</i>	<i>sce</i>	<i>he</i>	<i>hi</i>	<i>d</i> ₁	<i>d</i> ₂	<i>d</i> ₃	<i>d</i> ₄	<i>l</i> ₁	<i>l</i> ₂	<i>l</i> ₃	<i>l</i> ₄	<i>sae</i>	<i>sai</i>	
♂	76	46	90	109	19	41	41	38	13	74	87	27	27	54	16	
♀	87	65	95	109	16	27	54	74	70	19	74	109	27	27	60	27
Protonymph	54	33	54	54	13	27	41	27	11	54	65	22	22	54	13	

brackets give the number of setae and solenidia arising from tarsus, tibia, genu, femur and trochanter, respectively.

TABLE II. CHAETOTACTIC FORMULA

	<i>Leg I</i>	<i>Leg II</i>	<i>Leg III</i>	<i>Leg IV</i>
A. <i>Setae</i> Male and female	(9.2.2.1.1)	(9.2.2.1.1)	(7.1.1.0.1)	(7.1.0.1.0)
B. <i>Solenidia</i> Male and female	(2.1.2.0.0)	(1.1.1.0.0)	(0.1.1.0.0)	(0.1.0.0.0)

The setae and solenidia have the same arrangement as in other acarid mites. On legs I and II, ω_1 (ω_1) is a rod of even diameter, longer than phi (ϕ) of tibiae I and II (Figs. 3 and 4)

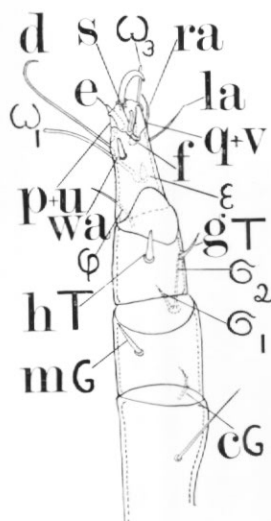


Fig. 3. *Neohyadesia signyi*. Male. Ventral view of terminal four segments of right leg I. ω_1 , ω_3 , ϕ , σ_1 , σ_2 solenidia; ϵ famulus; $q+v$, $p+u$, s ventral terminal spines; d , e , f , la , ra , wa setae and spines of tarsus; gT , hT setae and spines of tibia; cG , mG setae and spines of genu.

and the terminal ω_3 ; ω_2 is missing and the famulus epsilon (ϵ) is a small pointed peg arising from the same depression as ω_1 . Sigma₁ (σ_1) and σ_2 of genu I are of unequal length and on

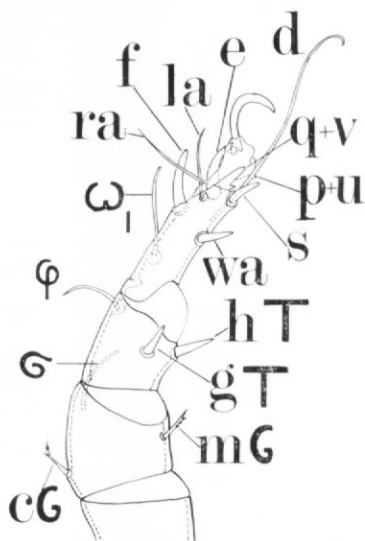


Fig. 4. *Neohyadesia signyi*. Male. Internal view of terminal three segments of left leg II.

ω_1 , ϕ , σ solenidia; $q+v$, $p+u$, s ventral terminal spines; d , e , f , la , ra , wa setae and spines of tarsus; gT , hT setae and spines of tibia; cG , mG setae and spines of genu.

genu II, σ is of about the same length as ϕ of tibia II. ϕ is also present on tibiae III and IV; on tibia III it arises from the middle of this segment (Figs. 5 and 6).

At the distal end of leg I, the ventral spine $q+v$ is thick, arising from a deep socket and, in uncompressed specimens, it conceals the slender mid-ventral spine s . The external spine $p+u$ is smaller. On the tarsi of the remaining legs, $p+u$ and $q+v$ are represented by branched spines (Figs. 4, 5 and 6) whilst s is larger and more conspicuous.

On all the tarsi, e is a spine arising from the external side of the tarsus, f is also shaped like a spine and is more dorsal in position than usual; a seta on the internal side of tarsi I and II only is called la , since la is normally present on tarsi I and II only. The seta d which is sickle-shaped at the end arises from the external side of the dorsal aspect on tarsi I and II, but on tarsi III and IV it is median in position and distal to the spine called f (cf. Figs. 3 and 5). Of

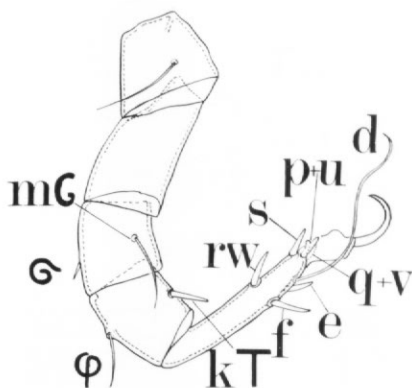


Fig. 5. *Neohyadesia signyi*. Male. External view of right leg III.

σ , ϕ solenidia; $q+v$, $p+u$, s ventral terminal spines; d , e , f , rw setae and spines of tarsus; kT , mG spine and seta of tibia and genu.



Fig. 6. *Neohyadesia signyi*. Male. Internal view of terminal two segments of right leg IV.
 ϕ solonidion; $q+v$, $p+u$, s ventral terminal spines; d , e , f , r , w setae and spines of tarsus; kT spine of tibia.

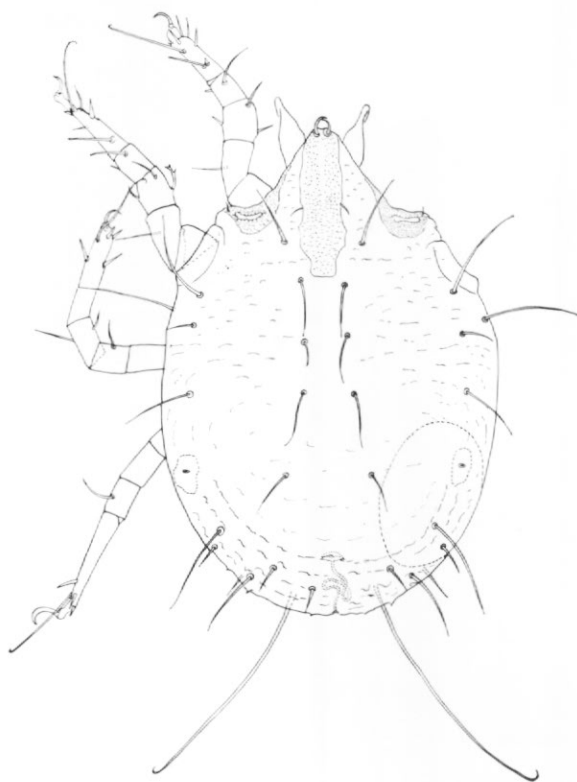


Fig. 7. *Neohyadesia signyi*. Female. Dorsal view.

the three setae which usually arise from the median region of tarsi I and II, *la* and *ra* are terminal and *wa* is a ventral spine. Tarsus III is unusual in possessing a single ventral spine only (*rw*), whilst two spines *r* and *w* occupy a similar position on tarsus IV (Figs. 5 and 6), *w* being thicker than *r*.

The chaetotaxy of the remaining segments follows the usual pattern. On tibia I, *hT* is stouter than *gT*, and *cG* on genua I and II are both slightly serrated; *mG* is smooth on genua I and III, but serrated on genu II.

Allotype (female) (Fig. 7). Length of idiosoma: 650 μm .

The scale-like wrinkling of the cuticle is more marked in the female than in the male and a similar dorsal propodosomal shield is present. Ventrally, apodemes I unite to form a short sternum and apodemes II extend posteriorly to touch the crescent-shaped epigynum. The internal ends of apodemes III and IV are free. The dorsal body setae are arranged as in Fig. 7 and, in length and arrangement, are similar to those of the male.

Genital folds which cover the opening of the oviduct, extend between coxae II and III (Fig. 8). Their anterior edges are covered by a crescentic epigynum and they are surrounded by three pairs of genital setae. The bursa copulatrix is terminal and from it a thin coiled tube opens into a large receptaculum seminis (Fig. 9). The anus is flanked by two pairs of anal setae and a long pair of post-anals (Fig. 10).

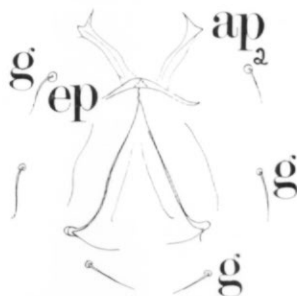


Fig. 8. *Neohyadesia signyi*. Female. Genital opening. *ep* epigynum; *g* genital setae; *ap*₂ apodemes₂.



Fig. 9. *Neohyadesia signyi*. Female. Bursa copulatrix, *bc*, and receptaculum seminis, *rs*.

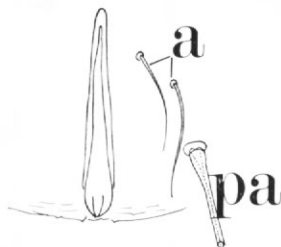


Fig. 10. *Neohyadesia signyi*. Female. Ventral view of anal region. *a*, *pa* anal and post-anal setae.

The chaetotaxy of the legs is similar to that of the male. On all the tarsi $p+u$ and $q+v$ are branched spines (Figs. 11–14). The dorsal terminal seta *d* is longer than in the male and the difference in length between σ_1 and σ_2 is not so marked. On tibia I, *gT* and *hT* are the same size, and on genua I and II *mG* and *cG* are serrated; *mG* on genu I and *cG* on genu II are forked at their tips.

Protonymph. Length of idiosoma: 205 μm .

This closely resembles the female, but shows the same modification in chaetotaxy as is characteristic of other free-living acarid mites.

Larva (Fig. 15). Length of idiosoma: 205 μm .

This resembles the protonymph, but the dorsal propodosomal shield is not clearly defined and it lacks the two shorter pairs of lateral setae and the two posterior pairs of sacrals. The claws on the legs are disproportionately large and the solenidion ω_1 on tarsus II is almost the same length as the tarsus.

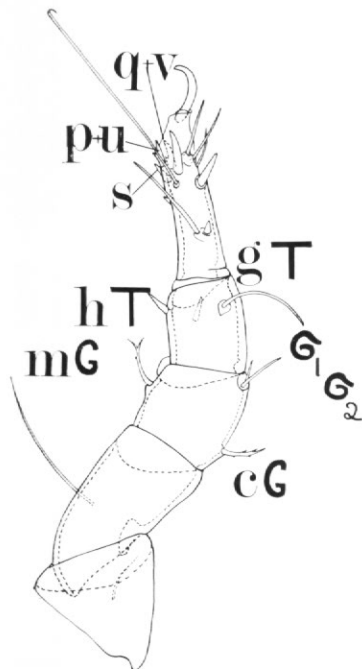


Fig. 11. *Neohyadesia signyi*. Female. Dorsal view of left leg I.

$p+u$, $q+v$, *s* ventral terminal spines; *gT*, *hT* spines of tibia; *mG*, *cG* setae of genu; σ_1 , σ_2 solenidia of genu.

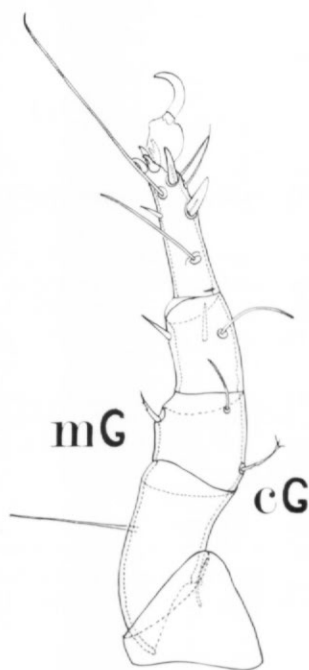


Fig. 12. *Neohyadesia signyi*. Female. Dorsal view of left leg II.
mG, *cG* setae of genu.



Fig. 13. *Neohyadesia signyi*. Female. Internal view of terminal three segments of right leg III.



Fig. 14. *Neohyadesia signyi*. Female. External view of terminal two segments of left leg IV.



Fig. 15. *Neohyadesia signyi*. Larva. Dorsal view. ω_1 solenidion of tarsus II; I_1, I_2 lateral setae.

DISCUSSION

The family Hyadesidae was created by Halbert (1915) to include the genus *Hyadesia* (type species: *Hyadesia uncinifer* Ménézin 1889), a number of species of which have been found feeding on algae in sea or brackish water in different parts of the world. A key to the species has been compiled by Womersley (1961). Manson (1963) also listed a number of species and gave a brief review of the literature. Hughes (1955) described the genus *Algophagus* from Heard Island which should also be included in the family Hyadesidae and to which the genus *Neohyadesia* is related.

The genera *Algophagus* and *Neohyadesia* are related in the following characters: in both, the anterior edge of the propodosoma is markedly prolonged so as to overhang the gnathosoma and no transverse groove is present separating the propodosoma from the hysterosoma. The chaetotaxy of the dorsal surface is similar, noticeably in the possession of vertical posterior setae. On tarsus III both genera have only one ventral seta, *rw*, instead of the customary two.

Neohyadesia differs, however, in apodemes II of the male ending freely on their internal edges and also in lacking genital sense organs; also the paired genital folds are replaced by a

hinged plate. On tarsus I the solenidion ω_2 is missing in both sexes and the terminal ventral spines $p+u$ and $q+v$ are branched.

Both *Neohyadesia* and *Algophagus* differ from *Hyadesia* in lacking the long pretarsus and dorsal prolongation of the end of the tarsus which are the most conspicuous characters of the genus as defined at present. With further study of species belonging to the genus *Hyadesia*, it may be found necessary to create a number of new genera when other characters are more closely studied. At the moment, these species are placed in a single genus largely on the structure of the pretarsus and also a similarity of habitat.

Diagnosis

The following diagnosis of the genus *Neohyadesia* is proposed: aquatic mites with well-developed claws, but lacking a stalk-like pretarsus as in the genus *Hyadesia*. With an unconstricted idiosoma whose anterior edge is prolonged forwards so as to almost completely conceal the gnathosoma. Vertical posterior, as well as vertical external setae are present. Four pairs of lateral setae arise from the sides of the body. On tarsus I, ω_2 is missing and on tarsus III only one ventral spine is present, although two are found on tarsus IV. There is little sexual differentiation, the male only differing from the female in the chaetotaxy of tarsus I and in the structure of the genitalia. No genital sense organs are present in either sex, and in the male genital folds are represented by a hinged plate.

Type (and only) species: Neohyadesia signyi n. sp.

TYPES

The holotype (male) and allotype (female) are mounted in C.M. mountant and labelled "fresh or brackish pool, Paal Harbour, Signy Island, B.J.A. Goodman coll.". Similar preparations have been made of the immature stages and all these slides have been deposited in the Archnida Department of the British Museum (Nat. Hist.), catalogue number 1969.166-168 (1-5).

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REFERENCES

- GRANDJEAN, F. 1939. La chaetotaxie des pattes chez les Acarididae. *Bull. Soc. zool. Fr.*, **64**, No. 1, 50-56.
 HALBERT, J. N. 1915. Acarinida II. Terrestrial and marine Acarina. *Proc. R. Ir. Acad.*, **31**, 45-136.
 HUGHES, A. M. 1955. A new genus and species of hyadesid mite—*Algophagus antarcticus*—from Heard Island. *A.N.A.R.E. Rep.*, Ser. B, Zoology, **1**, 1-19.
 MANSON, D. C. M. 1963. A new species of *Hyadesia* (Acarina : Carpoglyphidae). *Proc. ent. Soc. Wash.*, **65**, 163-67.
 WOMERSLEY, H. 1961. New species of Acarina from the intertidal zone of Netherlands New Guinea. *Zool. Meded.*, **37**, 189-209.