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NOTES ON THE SPECIES OF THE GENUS EPILOHMANNIA FROM THE HAWAIIAN ISLANDS (Acarina: Oribatei)[1]

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Abstract: The discovery of more *Epilohmannia* specimens from Laysan — one of the leeward islands of the Hawaiian chain—is reported here. One new subspecies, *E. pallida pacifica* and 1 new synonymy, *E. verrucosa* is here discussed.

The first *Epilohmannia* record from Oahu I. was by Jacot (1934), *Epilohmannia verrucosa*. The discovery of more *Epilohmannia* from the Hawaiian Islands in Bishop Museum is reported here. These were collected by Dr Nixon Wilson from Laysan—one of the leeward islands of the Hawaiian chain.

I first believed these specimens to be identical with *E. verrucosa*, but a detailed examination proved these to consist of 2 different species. Fourteen of the 15 specimens collected are clearly different from *E. verrucosa*. Only 1 specimen is very similar to Jacot's species. In the course of comparing this species with cotypes of *E. verrucosa*, the latter was found to be identical with *E. cylindrica* Berlese 1904 s. str. Recently the identity of *E. cylindrica* was fully discussed (Hammen 1959; Schuster 1960; Wallwork 1962) and I knew that one of the species-complex (the type material of *E. cylindrica* s. lat.) which was designated later as *E. szanisloi* (Oudemans) by Schuster (1960) should bear the name *E. cylindrica* s. str.

E. verrucosa (including the specimen from Laysan I.) is here regarded as a synonym of *E. cylindrica*. The other specimens are described as a new subspecies of *E. pallida* Wallwork, 1962 from Africa.

Epilohmannia cylindrica (Berlese) s. str.

Lohmannia cylindrica Berl., 1904, p. 23, pl. 2, fig. 40.
Epilohmannia cylindrica (s. lat.): Lombardini, 1936, p. 40.—Balogh, 1943, p. 16.—Hammen, 1959, p. 53.
Epilohmannia cylindrica (s. str.): Wallwork, 1962, p. 671.
Lesseria szanislôi Oudemans, 1917, p. 78, figs. 127, 139.
Epilohmannia szanisloi: Schuster, 1960, p. 202, figs. 4-5.

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Epilohmannia verrucosa Jacot, 1934, p. 6, pl. 1, figs. 1-6. **New Synonymy.**

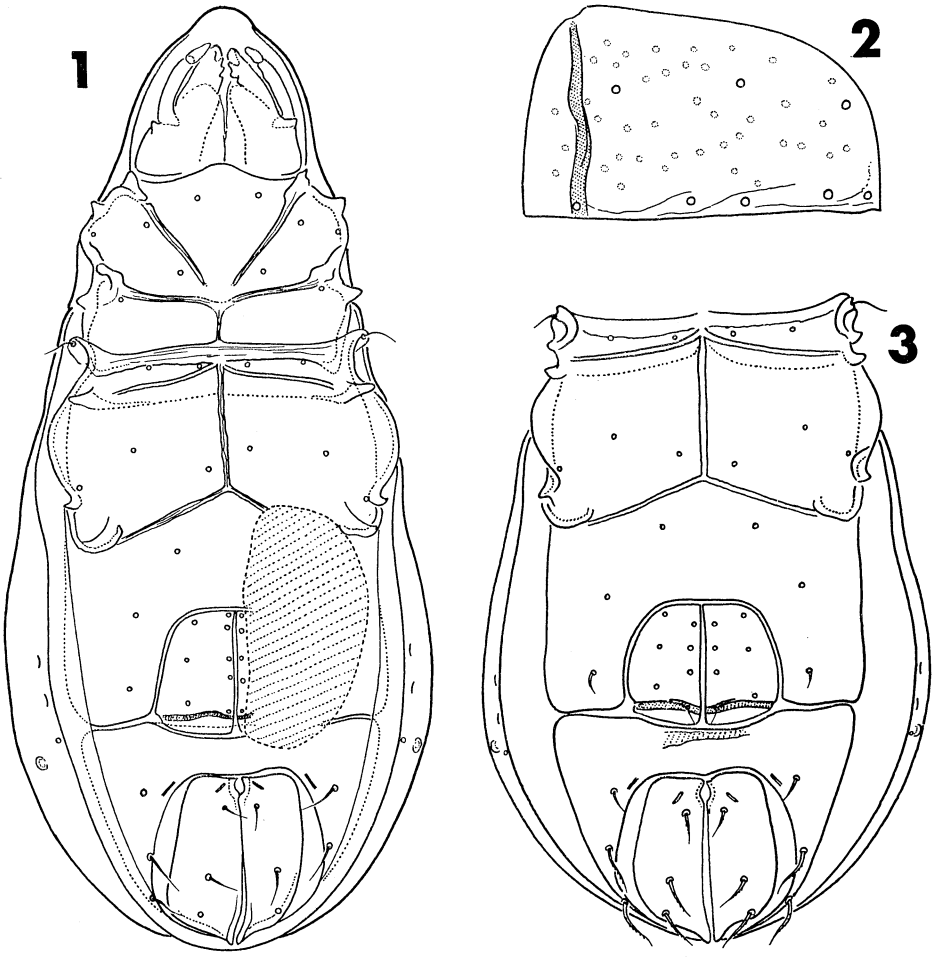
Jacot designated 3 cotypes (3♀♀, slide no. 2618nl and 281vn) for *E. verrucosa.* I found, however, only one slide (no. 2618nl) with 2 broken specimens in Bishop Museum's collection. They were mounted with their ventral side up and the condition of the specimens was not good enough for detailed examination. Re-examination of the cotype as well as the original description and drawings revealed some important characters which Jacot had overlooked or misunderstood.

Jacot mentioned his cotypes as "oviferous females." No eggs were found in the 2 cotypes examined, but some round objects which resembled fecal balls or bubbles were found. The sexual dimorphism of *E. cylindrica* is yet unknown and it is uncertain whether the cotypes actually represent ♀♀. On the assumption of the presence of sexual dimorphism such as studied by Wallwork (1962) the weak slopes of the epimeral ridges IV indicates a ♂ while the comparatively large genital aperture indicates a ♀. The position of the rostral setae, another sexual character, was hardly visible in the specimens.

I re-drew the ventral side of one of the cotypes which was undoubtedly the same specimen drawn by Jacot (1934, pl. 1, fig 1). In fig 1 both sides and the rostrum were completed and some overlooked structures were added. The re-examined characters and the figure drawn here seem to agree with those of *E. cylindrica* described as *Lesseria szanislói* Oudemans (1917) and *Epilohmannia szanisloi* Schuster (1960). The only noticeable difference is the position of the epimeral setae 3b. In the Hawaiian specimens these setae are situated about mid-distance between 3a and 3c, and not so close to 3a as in the European specimens. Jacot also stated in the regard "the lateral pair of parasterna III more distant from mesal pair (than in "*E. szanisloi*),....." (This "lateral pair" indicates undoubtedly not the setae 3c, but actually 3b). This difference, however, seems to be not so important to divide the species and is supressed in favor of the remaining strong resemblances between the Hawaiian and the European specimens.

"The interlamellar bristles" in Jacot's description (p. 7, l. 3) and his illustration (fig 3) is supposed to be the lamellar setae considering their position. In Jacot's figure (fig 1) 2 small pores were drawn near the lateral margin of the notogaster and he stated "smooth area includes two pseudoforamia, the posterior ones opposite posterior edge of ventral plate." But they are actually the setae pore *x2* and fissure *ip.* Besides them fissure *ih* is found anterior to *ip.* Both fissures are slit-like in shape, although Jacot drew *ip* as a round pore. Seta *4b* is situated anterior to the level of *4a* on the right side of the specimen as illustrated by Jacot as well as by me and also in the left side of the other specimen examined in the same slide, while *4a* and *4b* are situated on the same level on the left side of the specimen illustrated here. In this regard Schuster (1960, p. 203, l. 16) stated "Borste IVa inseriert entweder auf gleiche Höhe mit b, oder, was häufiger der Fall ist, mehr kaudad als b."

The structure of the legs of the cotypes, especially the setae, are hardly observable. In this regard, the following points in Jacot's description should be noted as incorrect: 1) "coxae" (p. 8, l. 36, 40 and 41) should read trochantera. 2) He stated (p. 8, l. 41) "Femora IV cylindrical, undulating, *as long as* their coxae" (=trochantera) and (p. 8, l. 48) Tibiae IV nearly *as long as* their femora,..."; but femora IV are distinctly shorter than the trochantera IV (his "coxae") and tibia IV are fairly shorter than the femora IV; the measurements of the segments (from trochanter to tarsus) are: 94-74-46-56-88 μ. 3) "a



Figs. 1-3. *Epilohmannia cylindrica* (Berlese). 1, ventral side of redrawn figure of one of the cotypes (slide no. 2618nl) of *E. verrucosa* Jacot regarded here as a new synonym of *E. cylindrica*; 2, genital plate of the same specimen; 3, ventral side of hysterosome drawn from specimen from Laysan.

slender, prostrate bristle on dorsal face near proximal end" (p. 8, l. 31) undoubtedly indicates solenidion ω_1 on tarsu I, but it is actually the thickest seta on the segment. The remainder of his detailed description agrees well with the result of my re-examination of the cotypes, although the dorsal side and legs III could not be examined carefully because of the mounting position and the loss, respectively.

MATERIAL EXAMINED: 1 ex., Laysan I., Hawaiian Is., 10. XII. 1963, from roots of bunch grass, N. Wilson.

On the single specimen collected the genital plates have 7 pairs of genital setae, namely 4 in paraxial row and 3 in antiaxial row. Posterior to the genital aperture is a dark, transverse ridge. The position of fissures *ih* and *ip* seems to be somewhat different from

that of cotypes; *ip* are situated almost in the same level of suture between anterior and posterior ventral plates. The setae on the entire body seem to be a little thicker than those of the cotypes. Length of propodosoma: 204 μ; width of propodosoma: 153 μ; length of hystreosoma: 387 μ; width of hysterosoma: 255 μ; body length (stretched): 617 μ. To achieve more detailed comparison we need more materials from Laysan as well as from Oahu.

Epilohmannia pallida pacifica Aoki, n. subsp.

MATERIALS EXAMINED: Holotype ♀ (BISHOP 3643), Laysan I., Hawaiian Is., 10.XII.1963, from roots of bunch grass, N. Wilson; 13♀♀ paratypes, same data.

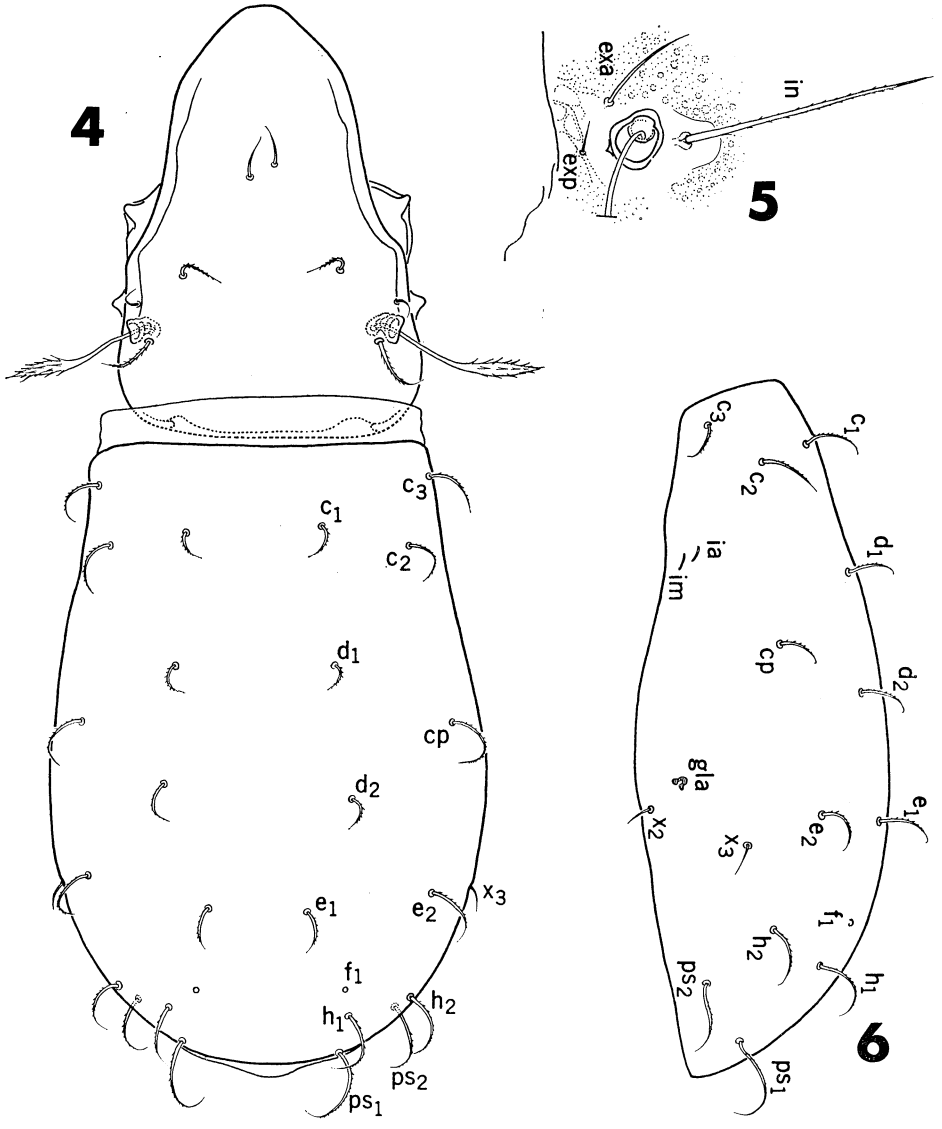
Measurement: Length: 372 (410) 428 μ; width: 158 (164) 184 μ.

The subspecies *E. pallida pacifica* is distinguishable from *E. pallida pallida* Wallwork, 1962 by the characters which are printed in *italics* in the following description.

Prodorsum: Rostral setae very fine, situated close together; their distal ends seem to be *bifid* at least in 2 among 10 specimens examined; *right seta inserted a little anterior to left one* in 5 specimens, the reverse in 1 specimen, and both setae on a same level in 4 specimens. Lamellar setae barbed distally, directed upward and then strongly bent mediad; length about 25 μ. Interlamellar setae 1.4–1.6× larger than that of lamellar setae. Anterior exobothridial setae inserted just anterior to bothridia, fine and slightly curved, about 15 μ in length; posterior exobothridial setae inserted laterad to bothridia, very delicate and hard to find. Sensillus with a distinctly swollen fusiform head; the head barbed in all directions; the exposed portion of sensillus about 50 μ in length, slightly longer than lamellar setae.

Notogaster: Rather elongate in shape, wider posteriorly than anteriorly, bearing 14 pairs of true notogastral setae; they are short, barbed and strongly curved; the posterior pairs, h_1, h_2, ps_2 and ps_3, somewhat longer than the remaining setae; c_1 and c_2 *remote from the anterior margin of notogaster*; c_1-d_1-d_1-c_1 *almost forming a square*, strictly speaking, however, the distance paraxial c_1-d_1 slightly wider than c_1-c_1 and *slightly narrower than* d_1-d_1; the distance d_2-d_2 slightly wider than d_1-d_1, and e_1-e_1 *distinctly narrower than* c_1-c_1; h_1-h_1 almost equal to d_2-d_2, and ps_1-ps_1 *nearly equal to* c_1-d_1. A pair of insertions for virtual setae f_1 located anterior to h_1. Aperture of latero-abdominal gland close to the lateral margin of notogaster, located in level of x_2 or a little anteriorly, and far more anterior to level of x_3. Notogastral fissures *ia* and *im* close together, situated almost in level of d_1 and far remote from cp. *There is no evidence for presence of ih and ip; neither slit nor pore found in the area where they expected to exist* (same in *E. pallida pallida*?).

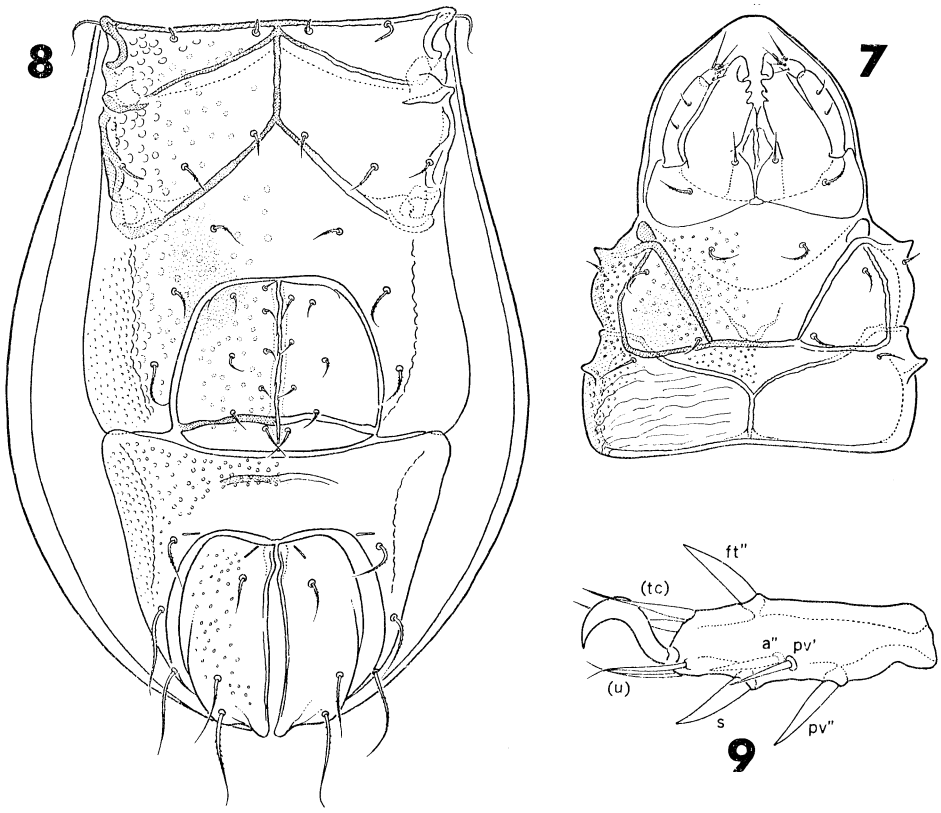
Anogenital region: Anal aperture longer than wide. Genital aperture wider than long, nearly trapezoidal in shape. Anal aperture as wide as genital aperture and longer than the latter. Interspace between the 2 apertures narrower than width of single anal plate. Anal setae an_1 and an_2 appreciably longer than an_3, about 1.5× as long as the latter. A pair of anal fissures aligned obliquely; their posterior ends diverging. Adanal setae ad_1 and ad_2 longer than ad_3. Adanal fissures situated in level of anterior border of anal aperture and *interior to* ad_3; *aligned transversely or showing weak tendency to be aligned along margin of anal aperture.* Between anal and genital aperture, *near to the latter*, a transverse ridge present. Each genital plate provided with a transverse ridge on the posterior portion; number of genital setae variable and the following setal formula was observed



Figs. 4-6. *Epilohmannia pallida pacifica* n. subsp. 4, dorsal side; 5, lateral view of bothridial region; 6, lateral view of notogaster.

in 10 specimens (from left to right—number of setae on: left antiaxial, left paraxial, right paraxial and right antiaxial row, respectively): *3-4-3-3*, *3-4-4-3*, *3-4-5-3*, *3-4-5-3*, *3-4-5-3*, *3-4-5-3*, *3-5-4-3*, *3-5-5-3*, *3-5-5-3 and 3-6-4-3*; number of genital setae, therefore, varies from 6 to 9, but typically 7 or 8, i.e. *3 in antiaxial row and 4 or 5 in paraxial row*; *number of setae in antiaxial row seem to be constant, always 3*; *reduction of number affects setae in the paraxial rows* (*not antiaxial rows*!). Aggenital setae also constant in number,

always 3 pairs; ag_1 located almost in level of mid-distance along genital aperture, *ag_2 nearly in level of anterior*; *margin of genital aperture* or a little more posteriorly, and *ag_3 clearly anterior to genital aperture.* Middle field of each ventral plate distinctly elevated as compared with the marginal zones. Epimeral region: Epimeral ridges I almost straight, broadly separated, so that the hysterostome is trapezoidal in shape. Coxisternal plate I on each side with a longitudinal, curved ridge situated just outside the seta lb; *posterior ends of these ridges and those of epimeral ridges I connected by a horizontal ridge*, sometimes stronger, sometimes weaker sclerotized than epimeral ridges II. Epimeral ridges II not horizontal, but come down medially and connected with sternal ridge. Coxisternal plates II narrower paraxially than antiaxially. Posterior border of ventrosejugal furrow more strongly sclerotized than anterior border. Epimeral ridges III and sternal ridge, altogether 3 ridges, connected medially at median point of posterior border of ventrosejugal furrow. Coxisternal plates III triangular in shape; a curved short ridge present near anterolateral corner of plates. Epimeral ridges IV with a stronger slope than epimeral ridges III, so that coxisternal plates IV *distinctly narrower* paraxially than antiaxially, namely *outer margin about 1.5× as long as inner one.* A small triangular projection present at each anterolateral part of coxisternal plates I and II, just behind insertion of leg. A



Figs. 7–9. *Epilohmannia pallida pacifica* n. subsp. 7, ventral side of propodosoma; 8, ventral side of hysterosoma; 9, antiaxial side of tarsus IV.

sclerotized, arched ridge found along anterior 1/2 of lateral margin of coxisternal plate III, and another similar ridge on middle part of lateral margin of coxisternal ridge IV. Moreover, a short transverse thickening present above proximal end of epimeral ridge III. Setal formula of epimerata: 3-1-3-3. Seta la situated *very close* to paraxial corner of triangular coxisternal plate I; 3c on anterior end of arched ridge of coxisternal plate III, and 4c on middle part of similar ridge of coxisternal plate IV.

Legs: Trochanter IV markedly longer than the remaining trochantera, *provided with a dorsal as ventral spur. Trochanter III has no dorsal spur, but a small ventral one.* Tarsus IV has 4 thickened setae (ft″, a″, s and pv″); ft″ and s thicker than pv″ or a″; a″ the smallest; setae (tc), (u) and pv′ normal; (tc) broadly thickened proximally; *pv′ slightly closer to s than to pv″.* All tarsi monodactyle.

REFERENCES

Balogh, J. 1943 Conspectus oribateorum hungariae. *Matem Termesz. Közl.* **39** (5): 1-193.

Berlese, A. 1904 Acari nuovi III. *Redia* **2**: 10-32, pls. 1-2.

Hammen, L. van der 1959 Berlese's primitive oribatid mites. *Zool. Verh.* no. **40**: 1-91.

Jacot, A. P. 1934 Some Hawaiian Oribatoidea (Acarina). *B. P. Bishop Mus., Bull.* **121**: 1-99, pls. 1-16.

Lombardini, G. 1936 Elenco alfabetico di specie esistenti nell'acaroteca della R. Stazione di Entomologia Agraria di Firenze. *Redia* **22**: 37-51.

Oudemans, A. C. 1917 Nitizen über Acari, 25. Reihe (Trombidiidae, Oribatidae, Phthiracaridae). *Arch. Naturg.* **82** (A6): 1-84, figs. 1-132.

Schuster, R. 1960 Über die Morphologie und Artengliederung der Gattung *Epilohmannia* Berlese 1917; (Ac., Oribatei). *Zool. Anzg.* **165** (5/6): 197-213.

Wallwork, J. A. 1962 Some Oribatei from Ghana. XI. The genus *Epilohmannia* Berlese 1916. *Acarologia* **4** (4): 671-93.