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EULAELAPS STABULARIS (KOCH, 1839)
AND EULAELAPS OUDEMANSI TURK, 1945
(MESOSTIGMATA: HAEMOGAMASIDAE)

BY

K. UCHIKAWA * and G. RACK **

ABSTRACT

An Eulaelaps mite population in straw at Holm near Wedel, Holstein, West Germany, comprised two valid species. They are designated as Eulaelaps stabularis (Koch, 1839) and Eulaelaps oudemansi Turk, 1945, and redescribed.

ZUSAMMENFASSUNG

Eine Population der Milben-Gattung Eulaelaps, die in Holm bei Wedel, Holstein, Westdeutschland gefunden wurde, setzt sich aus zwei Spezies zusammen. Sie wurden als Eulaelaps stabularis (Koch, 1839) und Eulaelaps oudemansi Turk, 1945 bestimmt und wiederbeschrieben.

Gamasus stabularis Koch is approved as the generic type of the genus Eulaelaps Berlese, 1903. As the original description of the mite, which was made in 1839, and neither in 1836 nor in 1840 as cited in many authors (COOREMAN in litt.), is insufficient, ambiguous understandings of its morphology prevail among acarologists in the world.

Recently, an advanced study of the Eulaelaps mites was made in China (WEN, 1976). An accurate morphology of E. stabularis is necessary for the clarification of any regional Eulaelaps fauna.

Although the description and drawing were unsatisfactory, KOCH (1839) wrote that stabularis was found in a great number on damp places under straw in a stall and a kennel. The present authors presumed that an Eulaelaps mite occurring in such habitat as described by KOCH in central Europe should be identical with type materials of G. stabularis, which were not available for them. They examined an Eulaelaps mite population represented by 63 specimens labelled as E. stabularis, taken from straw at Holm near Wedel, Holstein, West Germany, and found that these mites comprised the two different forms, one being essentially similar to E. stabularis in EVANS and TILL (1966) and the other according with OUDEMAN (1914) Hypoaspis stabularis

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Figs. 1-4: *Eulaelaps stabularis* (Koch) (A) and *Eulaelaps oudemansi* Turk (B), female.

1) Chelae; 2) Venter; 3) Epistome; 4) Peritrematal shield. A and B in the same scale.
that was thought to be an important source for better understanding of *E. stabularis* before (Vitzthum, 1925).

The present authors incline to think that the former form is the true *E. stabularis*. Definite morphological accounts for such assumption were repeatedly presented before Oudemans' (Trågårdh, 1912), and many present acarologists (Baker et al., 1956; Bregetova, 1956; Domrow, 1960; Wen, 1976) have accepted forms hardly separable from this form as *E. stabularis*. The latter form is also regarded as a valid species that has been confused with *E. stabularis* since Oudemans' (1914). As Turk (1945) presented the name, *Eulaelaps oudemansi*, for the nymph of Oudemans' *H. stabularis*, it is appropriate to adopt this name extensively for the latter form.

The present paper deals with the redescriptions of *E. stabularis* (Koch) and *E. oudemansi* Turk for eliminating misunderstandings of the generic type, *E. stabularis*.

**Eulaelaps stabularis** (Koch, 1839)
(Figs. 1-8 A)

*Gamasus stabularis* Koch, 1839, Deutschl. C.M.A. fasc. 27, no. 1.

*Eulaelaps arculalis* (Koch) Trågårdh, 1912, Arch. Zool. exp. gén. 8 : 577, figs. 90-93.


**Female** (Figs. 1-4, A). Measurements were taken from 5 specimens, and presented as means followed by ranges in parentheses.

*Gnathosoma*. Cheliceral segments I and II 94.5 (90-98) μ and 126.0 (120-133) μ long, respectively; movable digit 69.0 (68-73) μ, bidentate (Fig. 1 A). Deutosternum (= capitelary groove) with 9-10 rows of conspicuous denticles; each row with 6-7 denticles. Postero-external rostral setae 62.5 (60-65) μ apart and capitular setae 87.0 (85-88) μ apart. Epistome with about 6 fine, simple processes (Fig. 3, A). Corniculi 63.0 (60-65) μ long.

*Idiosoma*. Length 1002.8 (980-1025) μ; width 749.1 (710-780) μ. Dorsal shield 986.9 (950-1020) μ long, 706.7 (690-720) μ wide, granular and reticulated, heavily covered with smooth setae. Tritosternum with base, 43.0 (38-50) μ, and laciniae, 163.5 (155-178) μ. Sternal shield 147.5 (133-160) μ long and 193.3 (188-203) μ wide at level of setae *s2*; setae *s2* 96.0 (95-100) μ apart; distance between *s1* and *s4* 138.5 (133-145) μ. Genitoventral shield with conspicuous lateral incisions posterior to genital setae; maximum width 486.7 (470-510) μ; striae on posterior and postero-lateral portions prominent, reticulated with waved lines; 62.9 (60-68) opisthogastric setae present. A pair of setae between genito-ventral and metapodal shields, and a pair of pores off genito-ventral shield at level of incisions. Anal shield 96.1 (90-100) μ long from anterior margin to base of postanal seta and 241.9 (226-261) μ wide; paranal setae 74.0 (70-78) μ, postanal seta 85.0 (80-90) μ long. Peritreme extending to posterior third of coxa I; peritremal shield swollen and truncated posteriorly; striae simple; posterior pore small (Fig. 4, A).

**Legs.** Hypertrophy of ventral setae on tarsi II, III and IV not prominent. Average length/width in microns of leg segments:

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MALE (Figs. 5-7, A). Two specimens were examined.


Idiosoma. Length 800-820 μ; width 490-520 μ. Dorsal shield covering whole dorsum. Tritosternum with base, 45 μ, and laciniae, 105 μ long. Holoventral shield 640-640 μ long and 420-430 μ wide, covering venter widely but leaving soft integument marginally, bearing 51-56 opisthogastric setae; setae st 1 88-92 μ apart and distance between st 1 and st 3 110-120 μ. Paranal setae not measured; postanal seta 58 μ long. Peritrematal shield and posterior region as in female, but peritreme not reaching to coxa I.

Legs. Ventral setae on distal segments of leg II as in Fig. 7, A. Length/width in microns of leg segments:

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DEUTONYMHP (Fig. 8, A). Four specimens were examined. Measurements are presented as a range taken from 3 specimens.


Idiosoma. Length 820-880 μ; width 610-640 μ. Dorsal shield with a pair of deep lateral incisions at demarcation of pronotal and opisthonal regions; 730-750 μ long and 380-390 μ wide at level slightly anterior to lateral incisions; about 55 setae each on pronotal and opisthonal regions of the shield. Opisthonal setae on the shield distributed laterally and posteriorly, and only 3 pairs of submedian setae and a single pair of setae laterad from first submedian setae present on antero-median part. Tritosternum with base, 53-58 μ, and laciniae, 125-138 μ. Sterno-genital shield 303-315 μ long from basal level of setae st 1 to posterior margin; setae st 2 bearly on the shield 135-138 μ apart. Metapodal shields small and subcircular. Anal shield 100-105 μ long and 115-125 μ wide, with straight anterior margin; paranal setae 60-73 μ long, and postanal seta 73-83 μ long. Peritreme extending to posterior level of coxa I; peritrematal shield very weakly developed; posterior pore very small, hardly visible.

This deutonymph is not identical with that in Oudemans (1914).

Material examined. Two males, 12 females and 4 deutonymphs from straw, Holm near Wedel, Holstein NW Germany, 25-XI-1960, Ch. Sebelin.

Eulaelaps oudemansi Turk, 1945
(Figs. 1-8, B)


FEMALE (Figs. 1-4, B). Measurements were based on 5 specimens.

Gnathosoma. Cheliceral segments I, 99.5 (95-110) μ, and II, 127.0 (125-135) μ; movable digit 72.5 (70-78) μ. Deutosternum with 11-13 rows of conspicuous denticles; each row with
Fig. 5-7: *Eulaelaps stabularis* (Koch) (A) and *Eulaelaps oudemansi* Turk (B), male.
5) Chelae and spermadactyl; 6) Holoventral shield; 7) Leg II. A and B in the same scale.
6-7 denticles. Postero-external rostral setae 74.5 (70-78) μ apart; capitial setae 93.5 (90-98) μ apart. Epistome with about 9 strong, dentated processes (Fig. 3, B). Corniculi 69.0 (65-73) μ long.

*Idiosoma.* Length 1 059.6 (1 016-1 090) μ; width 790.0 (755-825) μ. Dorsal shield 1 035.4 (1 000-1 080) μ long and 752.5 (715-780) μ wide, granular and reticulated, heavily covered with smooth setae. Tritosternum with base, 55.0 (50-58) μ, and laciniae, 153.0 (145-163) μ. Sternal shield 123.3 (110-133) μ long and 193.8 (188-205) μ wide at level of setae st₂; setae st₁ 116.0 (113-120) μ apart; distance between st₁ and st₃ 136.5 (133-140) μ. Genito-ventral shield with lateral depressions or very narrow invaginations, but lacking deep incisions posterior to genital setae; maximum width 552.5 (530-580) μ; striae on posterior portion prominent, reticulated with strongly waved lines; 82.7 (74-93) opisthogastric setae present. Setae absent between genito-ventral and metapodal shields. Anal shield 102.0 (98-118) μ long from anterior margin to base of postanal seta and 253.8 (238-273) μ wide; paranal setae 87.0 (83-93) μ, postanal seta 64.0 (60-70) μ long. Peritrematal shield very weakly swollen posteriorly; striae complicated; posterior pore large (Fig. 4, B).

*Legs.* Hypertrophy of ventral setae on tarsi II, III and IV weak. Average length/width in microns of leg segments:

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<td>239.3/55.0</td>
<td>165.5/55.5</td>
<td>195.5/50.0</td>
<td>307.0/48.0</td>
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**MALE** (Figs. 5-7, B). Seven specimens were examined, and measurements were based on 5 specimens.

*Gnathosoma.* Cheliceral segments I, 75.3 (71-80) μ, and II, 118.0 (113-125) μ; movable digit 69.0 (65-75) μ; spermadactyl distinctly surpassing tip of movable digit and its tip slant. Deutosternum with 12-13 rows of denticles. Postero-external rostral setae 68.5 (68-70) μ apart; capitious setae 74.0 (70-75) μ apart. Corniculi 62.0 (58-68) μ long. Epistome as in female, but developed more weakly.

*Idiosoma.* Length 824.2 (790-840) μ; width 560.0 (530-600) μ. Dorsal shield covering whole dorsum. Tritosternum with base, 43.0 (38-50) μ, and laciniae, 139.4 (138-145) μ long. Holoventral shield (Fig. 6, B) 637.0 (600-655) μ long and 464.0 (450-490) μ wide, strongly expanded posterior to coxae IV but leaving soft integument marginally, bearing 69 (64-72) opisthogastric setae; setae st₄ 94.0 (88-100) μ apart; setae st₅ and st₆ 119.0 (113-125) μ apart; paranal setae 53.8 (53-55) μ and postanal seta 53.0 (53-53) μ long. Peritrematal shield and posterior pore as in female.

*Legs.* Ventral setae on distal segments of leg II as in Fig. 7, B. Average length/width in microns of leg segments:

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<td>tarsus</td>
<td>234.0/49.0</td>
<td>161.5/48.5</td>
<td>167.0/43.0</td>
<td>272.5/42.0</td>
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**DEUTONYMPH** (Fig. 8, B). Five specimens were examined, and measurements were based on 2 specimens.

**Idiosoma.** Length 850-950 μ; width 612-650 μ. Dorsal shield 800-830 μ long and 420-430 μ wide at demarcation of pronotal and opisthontal regions. A suture is present between pronotal and opisthontal regions on all the examined specimens, and it is not clear whether the dorsal shield is divided into 2 shields or it possesses a pair of deep incisions as in *E. stabularis*. About 80 setae each on shield anterior and posterior to suture; setae on opisthontal region ubiquitous on shield, but slightly denser posteriorly. Tritosternum with base, 55-65 μ, and laciniae, 125-138 μ. Sternoto-genital shield 315-325 μ long from basal level of setae st₁ to posterior margin; setae st₁ 150-150 μ apart. Metapodal shield small and subcircular. Anal shield 108-115 μ long and 115-117 μ wide; anterior margin convex; paranal setae 70-75 μ long, and postanal seta 60-60 μ long. Peritreme extending to posterior third of coxa I; peritrematal shield developed.
weakly; posterior pore conspicuous, subequal to or only slightly smaller than stigmata in diameter.

This deutonymph is not separable from that of *H. stabularis* (Fig. 236 in Oudemans (1914)).

**Material examined.** Seven males, 43 females and 5 deutonymphs, from straw, Holm near Wedel, Holstein, NW Germany, 25-XI-1960, Ch. Sebelin.

Fig. 9: Protonymphs. Dorsum.

**Remark.** Two very fragile specimens of the protonymph were contained but not identified. Although their detailed morphology was not clearly studied, the dorsal setation differed from each other on the 2 specimens as drawn in Fig. 9. The dorsum of the one mite (Fig. 9, A) may be identical with that in Oudemans' Fig. 7 (*Oudemans*, 1914), but the present authors believe that this type of the dorsum is for *E. stabularis*. And the second type as drawn in Fig. 9, B is probably that of *E. oudemansi*. The name *E. oudemansi* was given for the tritonymph (= deutonymph) only (*Turk*, 1945). The present authors include the adult of Oudemans' *H. stabularis* in *E. oudemansi*, but the protonymph in Oudemans is presumed not to correspond to his deutonymph and adult.

**Discussion**

As so many different forms have been lumped under *E. stabularis*, some acarologists may be reluctant to define the morphology of the mite strictly and to differentiate *E. oudemansi* from *E. stabularis*. The concomitancy of the two forms in the straw may suggest the presence of polymorphism in both sexes. The differences in the genito-ventral shield, peritrematal shield and posterior pore, epistome, number of denticle rows in deutosternum, relative length of paranal and postanal setae and in spermadactyl are sufficient to separate the two mites as valid species.
And clear but not remarkable differences as described above are not ascribable to polymorphism for mesostigmatid mites considering the cases of *Spinturnix* (Domrow, 1972) and lealapid mites. *E. stabularis* and *E. oudemansi* probably have a sympatric speciation. The distinctive differences in the setation and hypertrichy on the dorsal shield as well as the structure of the posterior pore and anal shield in the deutonymph and the existence of the two types of the protonymph also confirm the validity of both species.

A vast variation in the idiosomal size of *E. stabularis* has been made up through ambiguous understandings of the true mite. The range of idiosomal size for an *Eulaelaps* mite is not varied so remarkably according to trophic status or gravidity. Such the ranges as 1 200 μ to 770 μ (Vitzthum, 1925), 1 100 μ to 700 μ (Bregetova, 1956) and more than 1 000 μ to 700 μ (Wen, 1976) suggest that *E. stabularis* in papers of many authors are not conspecific. Vitzthum (1925) paid attention to this variation but did not present persuasive interpretations. Wen (1976), on the other hand, regarded former *E. stabularis* as a species-complex. Contrarily to the complete similarity in any partial structure of the males of *E. stabularis* from England (Evans and Till, 1966) and West Germany, difference in the idiosomal size for the both was noticeable, certainly beyonding the range of the intraspecific variation. Only two, considerably well chitinized specimens from Germany were available in the present study. Comparing with the size of *E. oudemansi* males, the size of German *stabularis* males seems to be moderate, while that of England male (dorsal shield, 582 μ × 348 μ in Evans and Till, 1966) is too small.

Wen (1976) adopted the structure and striation pattern of the peritrematal shield as one of the differential characters of *Eulaelaps* mites. The present authors also notice that the peritremaria is small in fewer species, while it is large in more species, inclusive of Japanese *Eulaelaps*. Trågårdh (1912) noted that stigma or stigma shaped depression (= posterior pore) close to posterior margin of peritrematal shield was much smaller in *E. arcualis*, which was synonymized with *E. stabularis* in the present paper, than the ordinary one. This suggests that European acarologists before Trågårdh (1912) accepted *E. oudemansi* or mites allied to it as *E. stabularis*. The designation of the above redescribed type instead of *E. oudemansi* type as *E. stabularis* may be expedient means based on understandings that have prevailed among leading acarologists since Trågårdh (1912).

*Eulaelaps* mites are blood-suckers and predators, and live in various habitats. They often associate with birds and mammals and their nests. Some mites found on particular animals show specific morphology. It is necessary to examine these mites as well as those described and, then, synonymized with *E. stabularis* thoroughly with a concept that they are possibly distinctive species.

ACKNOWLEDGEMENTS

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ADDENDUM: Besides of the deutonymphs described in this paper two small deutonymphs were observed. One deutonymph (idiosomal size 640 × 400 μ) with the characters of *E. stabularis*, the other (idiosomal size 700 × 460 μ) with those of *E. oudemansi*. In all probability the differences in size are sex-linked, both species have a great female deutonymph and a small male deutonymph.
REFERENCES


