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SOME ERIOPHYOID MITES ON CONIFEROUS PLANTS
FROM HIGH MOUNTAINS IN TAIWAN (ACARI: ERIOPHYOIDAE)

by Kun-Wei HUANG* and Jan BOCZEK**

ABSTRACT: This article describes and illustrates eight species of eriophyoid mites, including one new genus, one new subgenus and seven new species, from four species of coniferous plants in Taiwan: Phyllocoptes limsamus sp. nov. (infesting Abies kawakamii and Picea morrisonicola), Epitrimerus yunbimus sp. nov. (infesting Juniperus chinensis and Tsuga chinensis), Pentaporca taiwanensis gen. et sp. nov. (infesting Tsuga chinensis), Nalepella tisamae sp. nov., Setoptus (Orientis) inaequalis subgen. et sp. nov., Setoptus (Orientis) inusitatus sp. nov., Setoptus (Orientis) undatus sp. nov. (infesting Tsuga chinensis) and Trisetacus distinctus Smith, 1978 (infesting Juniperus chinensis).

RéSUMÉ: Cet article décrit et illustre huit espèces d'eriophyoides, y compris un nouveau genre, un nouveau sous-genre et sept nouvelles espèces, provenant de quatre espèces de conifères de Taiwan : Phyllocoptes limsamus sp. nov. (sur Abies kawakamii et Picea morrisonicola), Epitrimerus yunbimus sp. nov. (sur Juniperus chinensis et Tsuga chinensis), Pentaporca taiwanensis gen. et sp. nov. (sur Tsuga chinensis), Nalepella tisamae sp. nov., Setoptus (Orientis) inaequalis subgen. et sp. nov., Setoptus (Orientis) inusitatus sp. nov., Setoptus (Orientis) undatus sp. nov. (sur Tsuga chinensis), et Trisetacus distinctus Smith, 1978 (sur Juniperus chinensis).

This is the first report about Nalepellidae and Eriophyidae from coniferous plants in Taiwan. There are about 50 species of coniferous plants in Taiwan. All mite specimens were collected from high mountain (above 2500 m). In this study, there are five species belonging to three genera of eriophyid mites on Tsuga chinensis.

The materials are deposited at the Division of Collection & Research, National Museum of Natural Science, Taichung, Taiwan; and the Department of Applied Entomology, Agricultural University of Warsaw, Poland. All measurements are in micrometers (µm).

Pentaporca Huang, gen. nov.

Type species: Pentaporca taiwanensis Huang sp. nov.

Body fusiform, with shield lobe; rostrum small, evenly bent down; leg segments normal; coxal I separated; featherclaw simple; abdomen with all setae present; accessory setae present; opisthosomal rings differentiated into broader tergites and narrower sternites; dorsum with 5 ridges, middle one ends at half; sternites with oval microtubercles; coverflap smooth.

Etymology: The genus name is feminine gender, referring to the dorsum with five ridges.

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Note: This genus is close to Nalepella Keifer, 1944, but differs in having five longitudinal ridges on the tergites.

Pentaporca taiwanensis Huang, sp. nov.

(Fig. 1)

Female: Body spindleform, 179−222 long; shield 72−75 long, 88−97 wide; shield design median line straight from base to half, diverging from half to anterior region, admedian line forms cells with median line at basal third, submedian line absent; dorsal tubercles 18−24 from rear shield margin, 40−62 apart, setae 70−76 long, projecting anteriorly, frontal seta 48−51 long; coxae unornamented, 1st setiferous coxal setae 12 long, tubercles (CI) 20 apart, 2nd setiferous coxal setae 19 long, tubercles (CII) 24 apart, 3rd setiferous coxal setae 43 long, tubercles (CIII) 50 apart, sternal line absent; claw ending as a knob, claw I 14 long, claw II 14 long, fore-tibial 19 long, setae at apex, 10 long; featherclaw simple, 7 rayed.

Opisthosoma: about 42−49 tergites and 87−104 sternites; with oval microtubercles on sternites, the first 3 tergites long; abdomen with all setae present; lateral seta 20−43 long, lateral tubercles (L) 79−80 apart, the oblique distance from lateral tubercle to 1st ventral tubercle (L−VI) 72−75, 1st ventral seta 37−52 long, tubercles (VI) 46−50 apart, the oblique distance from 1st ventral tubercle to 2nd (VI−VII) 45−48, 2nd ventral seta 39−52 long, tubercles (VII) 29−36 apart, the oblique distance from 2nd tubercles to 3rd (VII−VIII) 72−74, 3rd ventral seta 14−26 long, tubercles (VIII) 26−38 apart; caudal setae 66 long, accessory setae present.

Coverflap: 31−37 wide, 24−29 long, smooth; genital tubercles (G) 21−25 apart, genital seta 24−29 long.

Male: not seen.

Holotype: female, collected from Tsuga chinensis Pritz.; Alishan (2800 m), Chiai, 17 May 1991, by K. W. Huang.

Paratypes: 3 females, same data as holotype.

A vagrant living on the twigs. No damage observed.

Nalepella tisamae Huang, sp. nov.

(Fig. 2)

Male: Body spindleform, 182−216 long; shield 53−64 long, 76−94 wide; shield design obscure, with dash like markings; dorsal tubercles 16−26 from rear shield margin, 37−56 apart, setae thick, 52−70 long, projecting anteriorly, anterior seta 12 long; coxae I with many spines, 1st coxae setae 13 long, CI 18 apart, 2nd coxal setae 26 long, CII 17 apart, 3rd coxal setae 54 long, CIII 33 apart, sternum 6 long; claw knobbed, claw I 7 long, claw II 7 long; foretibia 10 long, with spines on ventral side, spur at apex, setae claw-like ending as a knob at apex, 8 long; featherclaw simple, 7 rayed.

Opisthosoma: about 33−44 tergites and 68−96 sternites; dorsum with spine microtubercles, with oval microtubercles on sternites, the first 3 tergites long; abdomen with all setae present; lateral seta 16−32 long, L 63−86 apart, L−VI 52−73, 1st ventral seta 23−36 long, VI 37−47 apart, VI−VII 34−45, 2nd ventral seta 21−33 long, VII 21−33 apart, II−VIII 58−71, 3rd ventral seta 26−35 long, VIII 28−37 apart; caudal setae 10−13 long, accessory setae present.

Coverflap: 22−29 wide, 11−18 long; G 19−26 apart, genital seta 18−32 long; spermathecal tube long.

Female: not seen.

Holotype: male, collected from Tsuga chinensis Pritz.; Alishan (2800 m), Chiai, 17 May 1991, by K. W. Huang.

Paratypes: 3 males, same data as holotype.

A vagrant living on the twigs. No damage observed.

Etymology: The species name is derived from the Taiwanese name of the host plant.

Note: N. tisamae differs from N. tsugifoliae Keifer, 1953 by the lower number of body rings, longer tibiae and foretibiae with long, knobbed setae. This species coexists with Pentaporca taiwanensis on Tsuga chinensis.

Setoptus (Orientis) Huang, subgen. nov.

Type species: Setoptus (Orientis) inaequalis Huang, sp. nov.
FIG. 1: *Pentaporca taiwanensis* gen. et sp. nov. (female).

A. - Shield; B. - Genital and coxal area; C. - Anterior area, lateral view; D. - Anal area, lateral view; E. - Internal apodeme; F. - Featherclaw and claw.
General morphology as in *Setoptus (Setoptus)* Keifer, 1944. Cephalothoracic shield wider than long. Opisthosoma: completely microtuberculate; dorsum wavy or not; each tergite with posterior part somewhat longer than anterior and without microtubercles.

*Etymology:* The subgenus name is feminine and means “Orient”, with reference to the locality.

*Note:* This new subgenus differs from *Setoptus (Setoptus)* by having each tergites on posterior part longer than the anterior part.

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**Setoptus (Orientis) inaequalis** Huang, sp. nov.

(Fig. 3)

*Female:* Body worm-like, 182–206 long; shield 50–51 long, 69–71 wide; smooth; dorsal tubercles 16–17 from rear shield margin, 41–46 apart, setae thick, 44–61 long, projecting anteriorly, anterior seta 12 long; coxae I with many spines, 1st coxae setae 10 long, Cl 17 apart, 2nd coxal setae 22 long, CII 18 apart, 3rd coxal setae 41 long, CIII 35 apart, sternum 5 long; claw knobbed, claw I 7 long, claw II 7 long; foretibia 10 long, with spines on ventral side, spur at apex, setae claw like ending...
FIG. 3: Setoptus (Orientis) inaequalis subgen. et sp. nov. (female).
A. — Dorsal view;  B. Genital and coxal area;  C. — Anterior area, lateral view;  D. — Anal area, lateral view;  E. — Internal apodeme;  
F. — Featherclaw and claw.
as knob, at apex, 8 long; featherclaw simple, 7 rayed.

**Opisthosoma:** About 45–52 tergites and 66–70 sternites, with oval microtubercles on sternites and first two-thirds of tergites, the wider tergites 0.38–0.48 times length of body length; abdomen with all setae present; lateral seta 16–21 long, L 67–68 apart, L–VI 56–64, 1st ventral setae 15 long, VI 46 apart, VI–VII 46–49, and ventral seta 14–16 long, VII 23–28 apart, VII–VIII 62–74, 3rd ventral seta 19–26 long, VIII 27–33 apart; caudal setae 11 long; accessory setae present.

**Coverflap:** 25 wide, 15 long, smooth; G 19–22 apart, genital seta 21 long; spermathecal tube long.

**Male:** not seen.

**Holotype:** female, collected from *Tsuga chinensis* Pritz.; Alishan (2800 m), Chiai, 17 May 1991, by K. W. HUANG.

**Paratypes:** 1 female, same data as holotype.

**Etymology:** The species epithet is an adjective meaning “unequal”, in reference to the unequal width of tergites.

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**Setoptus (Orientis) inusitatus** Boczek, sp. nov.

(Fig. 4 A, B)

**Female:** Body worm-like, 187–223 long; shield 51–55 long, 69–72 wide; smooth; dorsal tubercles 18 from rear shield margin, 41–43 apart, setae thick, 61–71 long, projecting anteriorly, anterior seta 12 long; coxae I with many spines, 1st coxal setae 11 long, CI 16 apart, 2nd coxal setae 23 long, CII 18 apart, 3rd coxal setae 54 long, CIII 37 apart, sternum 5 long; claw knobbed, claw I 7 long, claw II 7 long; foretibia 11 long, with spines on ventral side, spur at apex, setae claw-like, ending as knob at apex, 8 long; featherclaw simple, 7 rayed.

**Opisthosoma:** About 42–44 tergites and 68–74 sternites; with oval microtubercles on sternites and anteriorly tergites, wider tergites irregular, 0.51–0.55 times length of body length; abdomen with all setae present; lateral seta 18–21 long, L 65–68 apart, L–VI 59–62, 1st ventral seta 13–18 long, VI 44 apart, VI–VII 42–50, 2nd ventral seta 17 long, VII 21–27 apart, VII–VIII 74–81, 3rd ventral seta 29 long, VIII 33–35 apart; caudal setae 16 long; accessory setae present.

**Coverflap:** 25–27 wide, 16–18 long, smooth; G 19–22 apart, genital seta 21 long; spermathecal tube long.

**Male:** not seen.

**Holotype:** female, collected from *Tsuga chinensis* Pritz.; Alishan (2800 m), Chiai, 17 May 1991, by K. W. HUANG.

**Paratypes:** 1 female, same data as holotype.

**Etymology:** The species epithet is an adjective meaning “unusual”, in reference to the irregular tergites on posterior part.

**Note:** *S. (O.) inusitatus* differs from *S. (O.) inaequalis* Huang by the ratio of wider tergites to length of body, and the wider tergites irregular.

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**Setoptus (Orientis) undatus** Boczek, sp. nov.

(Fig. 4 C, D)

**Female:** Body worm-like, 141–148 long; shield 44–46 long, 52–54 wide; smooth; dorsal tubercles 14–16 from rear shield margin, 24–33 apart, setae thick, 57–59 long, projecting anteriorly, anterior seta 10 long; coxae I with many spines, 1st coxal setae 11 long, CI 14 apart, 2nd coxal setae 31 long, CII 17 apart, 3rd coxal setae 58 long, CIII 31 apart, sternum 5 long; claw knobbed, claw I 5 long, claw II 6 long; foretibia 8 long, with spines on ventral side, spur at apex, setae claw-like, ending as knob, at apex, 7 long; featherclaw simple, 7 rayed.

**Opisthosoma:** about 52–54 tergites and 74–84 sternites; dorsum wavy, with oval microtubercles on sternites and first two-thirds of tergites, the wider tergites 0.35–0.41 times length of body; abdomen with all setae present; lateral seta 16–17 long, L 52–54 apart, L–VI 45, 1st ventral seta 11–14 long, VI 42 apart, VI–VII 38–40, 2nd ventral seta 11 long, VII 21–23 apart, VII–VIII 55, 3rd
Fig. 4: *Setoptus (Orientis) inusitatus* sp. nov. (female). A. — Dorsal view; B. — Anal area, lateral view; *Setoptus (Orientis) undatus* (female) sp. nov. C. — Dorsal view; D. — Anal area, lateral view.
FIG. 5: Epitrimerus yunbimus sp. nov. (female).

A. — Shield; — B. Genital and coxal area; — C. Anterior area, lateral view; D. — Anal area, lateral view; — E. Internal apodeme. F. — Featherclaw and claw.

ventral seta 30 long, VIII 25–26 apart; caudal setae 11 long; accessory setae present.


Male: 132 long, shield 40 long, 54 wide; genitalia 21 wide, 11 long.

Holotype: female, collected from Tsuga chinensis Pritz.; Alishan (2800 m), Chiai, 17 May 1991, by K. W. HUANG.

Paratypes: 1 female, 1 male, same data as holotype.

A vagrant living on the twigs. No damage observed.

Etymology: The species epithet is an adjective meaning “wavy”, in reference to the wavy tergites.

Note: S. (O.) undatus differs from other species of this subgenus by the wavy dorsum.

Epitrimerus yunbimus Huang, sp. nov.
(Fig. 5)

Female: Body spindleform, 171–193 long; shield 53–62 long, 79–91 wide; shield design with many
Phyllocoptes limsamus Boczek, sp. nov.
(Fig. 6)

**Female:** Body spindleform, 164–169 long; chelicerae 33 long; shield 46–48 long, 73–82 wide; shield design with median line absent, admedian lines from apical third to basal third, submedian lines present, the inner ones sinuous, from apical third to rear, the outer ones connecting anteriorly; dorsal tubercles 11–12 from rear shield margin, 21–24 apart, setae 5 long, projecting to upward and outer; coxae unornamented, 1st coxal setae 10 long, CI 14 apart, 2nd coxal setae 12 long, CII 13 apart, 3rd coxal setae 25 long, CIII 35 apart, sternum line present; claw ending as a knob, claw I 7 long, claw II 5 long; foretibia 10 long, setae at apical one-third, 16 long; featherclaw simple, 6 rayed.

**Opisthosoma:** about 33–36 tergites and 46–58 sternites; dorsum arch, the first 3 tergites 9 long; with oval microtubercles on sternites; abdomen with all setae present; lateral seta 11–16 long, L 60–61 apart, L-VI 54, 1st ventral seta 32–43 long, VI 32–34 apart, VI-VII 43, 2nd ventral seta 30 long, VII 16 apart, VII-VIII 51–55, 3rd ventral seta 18–24 long, VIII 27–31 apart; caudal setae 16 long, accessory setae present.

**Coverflap:** 24–26 wide, 15–16 long, with about 10 longitudinal striae, obscure; G 16–19 apart, genitalia 19–21 wide, 8–10 long, G 15–18 apart.

**Holotype:** female, collected from *Juniperus chinensis* Linn., Alishan (3520 m), Chiai, 15 May 1991, by K. W. HUANG.

**Paratypes:** 4 females, 2 males, from *Juniperus chinensis* Linn. data same as holotype; 2 males, collected from *Tsuga chimensis*; Alishan (3200 m), Chiai, 17 May 1991, by K. W. HUANG.

A vagrant living on the twigs. No damage observed.

**Etymology:** The species name is derived from the Taiwanese name of the host plant.

**Note:** This new species is similar to *E. phoeniceae* Keifer, 1962 but differs by the dorsal ridges with middle lobes; coverflap ridges and granular marking on genital basal area. This new species coexists with *Trisetacus distinctus* Smith, 1978 on *Juniperus chinensis*.
Trisetacus distinctus Smith, 1978

Trisetacus distinctus Smith, 1978: 1161.

Female: Body worm-like, 216 long; shield 35 long, 59 wide; dorsal tubercles 13 from rear shield margin, 34 apart, setae 38 long, anterior setae 9 long; coxae ornamented with dash lines, 1st coxal setae 11 long, CI 15 apart, 2nd coxal setae 19 long, CII 20 apart, 3rd coxal setae 39 long, CIII 41 apart, claw I 8 long, claw II 10 long; foretibia 9 long, setae at half, 7 long.

Opisthosoma: about 52 tergites and 78 sternites; the first 3 tergites 10 long; abdomen with subdorsal setae, 15 long; lateral seta 23 long, L 64 apart, L-VI 59, 1st ventral seta 33 long, VI 44 apart, VI-VII 47, 2nd ventral seta 15 long, VII 28 apart, VII-VIII 90, 3rd ventral seta 15 long, VIII 34 apart; accessory setae 20 long.

Coverflap 27 wide, 14 long; G 16 apart, genital seta 14 long.

Male: not seen.

Specimens examined: 3 females, collected from Juniperus chinensis Linn.; Alishan (3520 m), Chiai, 15 May 1991, K. W. HUANG. A vagrant living on twig. No damage observed.
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