Raphignathoid mites on bamboo from Fujian, China (Acari: Prostigmata)

QING-HAI FAN¹, YAN-XUAN ZHANG² & QIAO-YUN LIU³

¹ Department of Plant Protection, Fujian Agricultural University, Fuzhou 350002, China
² Institute of Plant Protection, Fujian Academy of Agricultural Sciences, Fuzhou 350013, China
³ Forestry Bureau of Fujian Province, Fuzhou 350003, China

Abstract

During an investigation of mites living on bamboo (Phyllostachys pubescens) in Fujian Province, four stigmaeid and three eupalopsellid mites (Raphignathoidea) were found, among which 4 species, namely Eryngiopus dicrotrichus, Saniosulus molliculus, S. longidius and S. yonganensis are new to science.

Key words: Bamboo, Raphignathoidea, new species, Fujian, China

Introduction

A few tetranychid and eriophyid mites have caused severe damage to the moso bamboo (Phyllostachys pubescens) in Fujian Province during recent years. In order to explore the biocontrol agents of these pest mites, a survey was conducted. This paper describes seven raphignathooid mite species (four of the Stigmaeidae and three of the Eupalopsellidae) found in the survey.

The terminology follows that of Kethley (1990). Type specimens will be deposited partly in Department of Plant Protection, Fujian Agricultural University and partly in Institute of Plant Protection, Fujian Academy of Agricultural Sciences. Measurements are given in micrometers.
**Agistemus divisus** Gonzalez


**Diagnosis.** Propodosomal shield and metapodosomal shield striated along midline. Diameter of postocular body about 3.7 times that of eye, and approximately equal to length of seta *sci*. Dorsal setae stout, with small prongs, and truncated, situated on tubercles. Ratios of setal lengths: \( \frac{vi}{vi} = 1, \frac{c_1}{c_1} = 0.5, \frac{c_1-e_1}{e_1} = 1.2, \frac{ve}{sci} = 1.1 \). Length of setae: \( vi = 35, ve = 43, sci = 39, c_1 = 29, c_2 = 41, d_1 = 31, d_2 = 34, e_1 = 35, e_2 = 35, f_1 = 36, h_1 = 36, h_2 = 30 \). Genital setae long, extending to bases of paraproctal setae *ps_2*. Two pairs of aggenital setae developed on individual platelets. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 2, trochanters 1, 1, 1, 1, femora 5, 4, 2, 2, genua 3\( +1 \), 1, 0, 0, tibiae 5\( +1 \), 5\( +1 \), 5\( +1 \), 5\( +1 \), tarsi 12\( +1 \), 9\( +1 \), 7\( +1 \), 7. Length of solenidia on tarsi: I\( \omega = 26, II\omega = 31, III\omega = 19 \).


**Distribution.** Fujian (Nanping, Yongan, Shouning), Taiwan.

**Agistemus huangshanensis** Hu & Hu


**Diagnosis.** Dorsal shields without striae or reticulation. Diameter of postocular body about 2.8 times that of eye and 1/3 length of seta *sci*, and accompanied by an accessory body. Dorsal body setae pectinated and situated on tubercles. Ratio of setal lengths: \( \frac{vi}{vi} = 2.7, \frac{c_1}{c_1} = 1.7, \frac{c_1-e_1}{e_1} = 1, \frac{ve}{sci} = 1.3 \). Genital setae long, extending to bases of paraproctal setae *ps_2*. 2 pairs of aggenital setae situated ...
on a pair of small shields. Counts of setae and solenidia on legs as in *Agistemus divisus* Gonzalez. (In the original description solenidion κ on genua I was not counted).

**Samples examined.** 5 females, Meilie, Sanming, Fujian, China, 1997. X. 30, Y.-X. Zhang.  

**Distribution.** Fujian (Sanming), Anhui.

**Zetzellia lushanensis** Hu & Chen


**Diagnosis.** Dorsal shields smooth, without reticulation. Median shield integral. Seta $c_1$ situated on media shield but with striae near its bases. Dorsal setae short, with minute prongs. Ratios of setae: $vi/vi-vi = 0.7$, $ve/ve-sci = 1$, $sci/c_2 = 1.1$, $h_1/h_2 = 0.9$; $c_1-c_1 : d_1-d_1 : e_1-e_1 : f_1-f_1 = 1.4 : 2 : 1 : 1.2$. Genital setae extending to bases of paraproctal setae $ps_3$. Two pairs of aggenital setae, the first pair much longer. Paraproctal setae approximately equal in length. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 1, trochanters 1, 1, 1, 0, femora 4, 4, 2, 2, genua 3+1κ, 1, 0, 0, tibiae 5+1φρ, 5+1φρ, 5+1φρ, 5+1φρ, tarsi 13+1ω, 9+1ω, 7+1ω, 7+1ω. Ratio of dorsal setae in male: $vi/vi-vi = 0.7$, $ve/ve-sci = 1$, $sci/c_2 = 1.1$, $h_1/h_2 = 0.7$; $c_1-c_1 : d_1-d_1 : e_1-e_1 : f_1-f_1 = 1.2 : 1.6 : 1 : 1.2$.


**Distribution.** Fujian (Lianjiang, Liancheng, Shouning, Zhangping). Guizhou (Guiyang), Jiangxi (Haihui).
Remark. The paratypes of *Z. lushanensis* and *Z. huaxiensis* were studied and we found that no specific difference existed between them. As the former name was published earlier, the latter one becomes a junior synonym.

*Eryngiopus dicrotrichus* sp. nov. (Figs. 1-12)

FEMALE. Red in life. Length of idiosoma 296 (296-340); width 147 (136-205). \( n = 5 \)

Gnathosoma. Chelicerae separated, 58 (58-62) in length (including digits). Movable digit 27 (27-32) long, about 1/3 length of chelicerae. Length of palpus 52. Counts of setae and solenidia on palpus (from trochanter to tarsus): 0, 3, 1, 3+1 claw, 4+1ω+1 spine+1 eupathidium. Eupathidium bi-forked sub-terminally. Palptarsal spine small, shorter than eupathidium. Subcapitulum bearing 2 pairs of setae, posterior pair about 2.7 times length of anterior pair, \( m \) 17 (16-17), \( n \) 46 (45-52); distances between \( m-m \) 27 (27-31), \( n-n \) 24 (24-25).

Dorsum. Striated in most areas, with 13 pairs of finely barbed setae. Propodosoma covered by a pair of small shields, each with 2 setae and 1 eye. Seta \( sci \) located just behind this shield. Hysterosoma with a pair of minute shields between setae \( d_1 \), and a pair of suranal shields behind setae \( f_1 \). Dorsal striae longitudinal except in areas around setae \( f_1 \). Each suranal shield bearing 2 forked setae (not clearly seen in some specimens). Ratio \( ve/sci = 1.1, ve/sce = 0.9, ve/c_2 = 0.7, c_1-c_1 : d_1-d_1 : e_1-e_1 : f_1-f_1 = 1.3 : 2.3 : 1 : 1.7 \). Lengths of setae: \( vi \) 11 (10-12), \( ve \) 17 (15-17), \( sci \) 16 (14-16), \( sce \) 19 (19-20), \( c_1 \) 11 (11-12), \( c_2 \) 24 (21-24), \( d_1 \) 11 (10-11), \( d_2 \) 18 (17-18), \( e_1 \) 9 (9-10), \( e_2 \) 9 (9), \( f_1 \) 12 (11-13), \( h_1 \) 15 (15-16), \( h_2 \) 17 (17-20); distances between setae: \( vi-vi \) 15 (11-15), \( vi-ve \) 12 (12-15), \( ve-sci \) 21 (21-23), \( sci-sce \) 19 (18-28), \( c_1-c_1 \) 39 (38-50), \( c_1-c_2 \) 42 (35-57), \( c_1-d_1 \) 70 (70-72), \( d_1-d_1 \) 72 (72-92), \( d_1-d_2 \) 35 (35-50), \( d_1-e_1 \) 52 (52-56), \( e_1-e_1 \) 31 (30-44), \( e_1-e_2 \) 32 (30-44), \( e_1-f_1 \) 26 (24-31), \( f_1-f_1 \) 54 (50-55), \( h_1-h_1 \) 20 (18-21), \( h_1-h_2 \) 18 (17-20).
**Venter.** Without intercoxal shields. Membrane between coxae bearing 3 pairs of setae, anterior 2 pairs ultra-long, more than 4 times as long as third pair, $1a$ 69 (69-72), $3a$ 67 (67-74), $4a$ 15 (15-18). Genital pore bearing 1 pair of setae, $g$ 25 (23-25). Three pairs of aggenital setae situated on individual platelets, $ag_1$ and $ag_2$ approximately equal in length, $ag_3$ much longer, $ag_1$ 17 (17-18), $ag_2$ 15 (15-17), $ag_3$ 27 (25-27). Anal pore sub-terminal, with 3 pairs of paraproctal setae, $ps_3$ stout and barbed as dorsal setae, $ps_2$ and $ps_1$ smooth. Lengths of setae: $ps_3$ 14 (13-15), $ps_2$ 16 (11-13), $ps_1$ 17 (11-14).

**Legs.** Lengths I-IV (from base of trochanter to tip of tarsal claw): 112 (110-117), 89 (85-93), 89 (86-96), 101 (98-109). Each tarsus bearing 1 solenidion $\omega$. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 1, trochanters 1, 1, 1, 0, femora 4, 4, 2, 2, genua 3+1 $\kappa$, 1, 0, 0, tibiae 5+1$\varphi$, 5+1$\varphi$, 5+1$\varphi$, 5+1$\varphi$, tarsi 13+1$\omega$, 9+1$\omega$, 7+1$\omega$, 7+1$\omega$. Lengths of solenidia on tarsi: $I$ $\omega$ 4 (4-5), $II$ $\omega$ 4 (4-5), $III$ $\omega$ 2.5 (2-3), $IV$ $\omega$ 2 (2).

**MALE.** Idiosoma 252 (252-261) long, 138 (123-138) wide. ($n=2$)

**Gnathosoma.** Chelicerae 48 (48-49) long. Movable digit 24 long. Length of palpus 46. Counts of setae and solenidia on palpi similar to female. Subcapitulum bearing 2 pairs of setae, $m$ 11 (10-11), $n$ 34 (31-34); distances between setae $m-m$ 24, $n-n$ 18.

**Dorsum.** Similar to female in the number and shape of setae. Ratio $ve/sci = 1.2$, $ve/sce = 0.9$, $ve/c_2 = 0.7$, $c_1-c_1 : d_1-d_1 : e_1-e_1 : f_1-f_1 = 1.5 : 2.4 : 1 : 1.3$; Lengths of setae: vi 9 (8-9), ve 12 (12-13), sci 10 (10-11), sce 14 (14), $c_1$ 9 (9-10) $c_2$ 17 (16-17), $d_1$ 8 (8-10), $d_2$ 12 (12-14), $e_1$ 7 (7), $e_2$ 8 (8), $f_1$ 9 (9-10), $h_1$ 5 (5), $h_2$ 17 (17); distances between setae: $vi-vi$ 11 (10-11), $vi-ve$ 10 (10), $ve-sci$ 20 (19-20), $sci-sce$ 16 (15-16), $c_1-c_1$ 36 (32-36), $c_1-c_2$ 38 (38-39), $c_1-d_1$ 50 (50-53), $d_1-d_1$ 57 (55-57), $d_1-d_2$ 27 (27), $d_1-e_1$ 31 (31-35), $e_1-e_1$ 24 (24-25), $e_1-e_2$ 23 (23), $e_1-f_1$ 18 (16-18), $f_1-f_1$ 32 (32-33), $h_1-h_1$ 5 (5), $h_1-h_2$ 16 (15-16).
FIGURES 1-4. Eryngiopus dicrotrichus sp. nov. (1-3, female; 4, male). 1. dorsum; 2. intercoxal setae 1a, 3a, 4a; 3. anogenital region; 4. dorsal hysterosoma.
*Venter.* As in female. Lengths of intercoxal setae, \(1a\) 54 (54-56), \(3a\) 56 (50-56), \(4a\) 12 (12-13). Anogenital pore terminal, genital setae absent. With 3 pairs of aggenital setae, \(ag_1\) 13 (11-13), \(ag_2\) 16 (13-16), \(ag_3\) 14 (14). The first pair of paraproctal setae very small, peg-like, lengths \(ps_3\) 9 (9), \(ps_2\) 9 (9), \(ps_1\) 4.5 (4.5).

*Legs.* Lengths I-IV: 99 (98-99), 78 (75-78), 78 (78), 92 (89-92). Counts of setae and solenidia similar to female except tarsi I-IV: 13+1\(\omega\)+1\(\sigma^\prime\), 9+1\(\omega\)+1\(\sigma^\prime\), 7+1\(\omega\), 7+1\(\omega\). Lengths of solenidia on tarsi, I\(\omega\) 4 (4-4.5), \(\omega\)\(\sigma^\prime\) 6 (6), II\(\omega\) 5 (5-6), \(\omega\)\(\sigma^\prime\) 5 (5-6), III\(\omega\) 6 (6-7), IV\(\omega\) 7 (7).

**FIGURES 5-12.** *Eryngiopus dicrotrichus* sp. nov. (5-8, female; 9-12, male). 5. leg I; 6-8. solenidia on tarsi II-IV, respectively; 9-12. solenidia on tarsi I-IV, respectively.
PROTONYMPH. Length of idiosoma 236, width 129. \(n=1\)

**Gnathosoma.** Chelicera 46, movable digit 22 long. Length of palpus 41. Counts of setae and solenidia on palpi as in female. Subcapitulum with only 1 pair of setae, \(m\) 13.

**Dorsum.** With 13 pairs of dorsal setae. Dorsal shields obscure. Ratios: \(ve/sci = 1.2, ve/sce = 0.9, ve/c_2 = 0.7, c_1-c_1 : d_1-d_1 : e_1-e_1 : f_1-f_1 = 1.8 : 2.3 : 1 : 1.4\). Lengths of setae: \(vi 8, ve 12, sci 10, sce 13, c_1 9, c_2 18, d_1 10, d_2 13, e_1 7, e_2 8, f_1 11, h_1 12, h_2 15\); distances between setae: \(vi-vi 9, vi-ve 12, ve-sci 18, sci-sce 16, c_1-c_1 46, c_1-c_2 43, c_1-d_1 52, d_1-d_1 58, d_1-d_2 27, d_1-e_1 38, e_1-e_1 25, e_1-e_2 24, e_1-f_1 13, f_1-f_1 34, h_1-h_1 13, h_1-h_2 12\).

**Venter.** With 2 pairs of intercoxal setae, \(1a 47, 3a 40, 4a\) absent. Genital setae absent. One pair of aggenitals, \(ag_1 13\); 3 pairs of para-proctal setae, \(ps_3 10, ps_2 8, ps_1 8\).

**Legs.** Lengths I-IV: 86, 78, 69, 76. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 0, trochanters 1, 0, 0, 0, femora 4, 4, 2, 1, genua \(3 + 1_\kappa, 0, 0, 0\), tibiae \(5 + 1_\varphi, 5 + 1_\varphi, 5 + 1_\varphi, 5 + 1_\varphi\), tarsi \(13 + 1_\omega, 9 + 1_\omega, 7 + 1_\omega, 6 + 1_\omega\). Lengths of solenidia on tarsi: \(I_\omega 4, II_\omega 3, III_\omega 2, IV_\omega 1.5\).

**Etymology.** The specific name \(dicrotrichus\) is formed from the Latin \(dicro\) (fork) and \(trichus\) (hair), referring to the shape of the suranal setae.

**Type material.** Holotype female, Gongchuan, Yunan County, Fujian, China, 1997. X. 28, Q.-Y. Liu; allotype male, same data as holotype; 5 females, 2 males and 1 protonymph, same data as holotype. 1 female, Chengyang, Fuan County, Fujian, China, 1997. VIII. 20, Q.-Y. Liu.

**Remarks.** The species is very closely related to \(E. placidus\) Kuznetsov, 1977, but can be distinguished from the latter by: (1) the very short third pair of intercoxal setae \(4a\), about one fourth the lengths of \(1a\) and \(3a\) (in \(E. placidus 4a\) long, more than one half the length of \(1a\) and approximately two-thirds the length of \(3a\)), (2) the presence of 1
seta on genu II (absent in *E. placidus*) and (3) bi-forked suranal setae $h_1$ and $h_2$ (simple in *E. placidus*).

**Saniosulus molliculus** sp. nov. (Figs. 13-23)

**FEMALE.** Pale red in life. Idiosoma length 281, width 142. ($n=1$)

**Gnathosoma.** Chelicerae fused and forming a long stylophore, 82 (including digits). Movable digits 49 long. Palpus 69 long, with a small tibial claw. Counts of setae and solenidia on palpi: 0, 2, 1, 2+1 claw, 4+1ω+1 terminal spine +1 eupathidium. Eupathidium rod-like, simple. Subcapitulum bearing 2 pairs of setae, $m = 15$, $n = 14$; distances between $m-m$ 12, $n-n$ 29.

**Dorsum.** Most areas striated longitudinally. Propodosoma without prominent shields. Opisthosoma with a small triangular shield in front of suranal shield, setae $e_1$ and $f_1$ arise from shield margin. Suranal shield developed, bearing 2 pairs of setae. Postocular body small, approximately 1.3 times diameter of eye. Dorsum with 13 pairs of setae, and setae $f_1$, $h_1$ and $h_2$ much longer than others. Lengths of setae: $vi$ 8, $ve$ 10, $sci$ 12, $sce$ 16, $c_1$ 12, $c_2$ 16, $d_1$ 12, $d_2$ 14, $e_1$ 11, $e_2$ 11, $f_1$ 21, $h_1$ 19, $h_2$ 22. Distances between setae: $vi$-$vi$ 25, $vi$-$ve$ 9, $ve$-$ve$ 30, $ve$-$sci$ 25, $sci$-$sce$ 20, $c_1$-$c_2$ 53, $c_1$-$d_1$ 38, $c_1$-$d_2$ 51, $d_1$-$d_1$ 32, $d_1$-$d_2$ 38, $d_1$-$e_1$ 55, $e_1$-$e_1$ 27, $e_1$-$e_2$ 25, $e_1$-$f_1$ 17, $f_1$-$f_1$ 39, $h_1$-$h_1$ 19, $h_1$-$h_2$ 16.

**Venter.** Without shields. Three pairs of intercoxal setae whip-like, ultra-long, the first and third pairs approximately equal in length and slightly shorter than the second pair, $la$ 55, $3a$ 60, $4a$ 55. Genital pore bearing 1 pair of setae, 13 long. Aggenital area with 3 pairs of setae and the first pair, $ag_1$, extending to the bases of the second pair, lengths: $ag_1$ 18, $ag_2$ 18, $ag_3$ 15. Anal pore with 3 pairs of paraproctal setae, $ps_3$ 11, $ps_2$ 18, $ps_1$ 16.

**Legs.** Lengths of legs I-IV (from base of trochanter to tip of tarsal claw): 117, 99, 90, 100. Each tarsus bearing 1 solenion ω. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 2, trochanters 1, 1, 1, 0, femora 4, 4, 2, 2, genua 1+1κ, 1, 1, 1, tibiae 5+1φρ, 4+1φρ, 4+1φρ,
4+1♀♀, tarsi 10+1♂, 8+1♂, 6+1♂, 6+1♂. Lengths of solenidia on tarsi: I♂ 8, II♂ 9, III♂ 4, IV♂ 4.5.

**FIGURES** 17-18. *Saniosulus molliculus* sp. nov. (female). 17, gnathosoma; 18, legs I.

*MALE*. Idiosoma 294 long, 123 wide.

*Gnathosoma*. Chelicerae 72 long. Palp 69 long. Seta on dorsal side of palp femur palm-like. Counts of setae and solenidia on palpi similar to female. Subcapitulum bearing 2 pairs of setae, \( m = 14, n = 14 \); distances between \( m-m \) 14, \( n-n \) 29.

*Dorsum*. Similar to female in number and shape of setae. Lengths of setae: \( vi \) 8, \( ve \) 9, \( sci \) 13, \( sce \) 17, \( c_1 \) 13, \( c_2 \) 15, \( d_1 \) 13, \( d_2 \) 14, \( e_1 \) 11, \( e_2 \) 12, \( f_1 \) 21, \( h_1 \) 15, \( h_2 \) 18; distances between setae: \( vi-vi \) 26, \( vi-ve \) 10, \( ve-ve \) 34, \( ve-sci \) 22, \( sci-sce \) 17, \( c_1-c_1 \) 50, \( c_1-c_2 \) 38, \( c_1-d_1 \) 49, \( c_1-d_2 \) 36, \( d_1-d_1 \)
36, \( d_1-d_2 \) 38, \( d_1-e_1 \) 50, \( e_1-e_1 \) 20, \( e_1-e_2 \) 22, \( e_1-f_1 \) 14, \( f_1-f_1 \) 36, \( h_1-h_1 \) 19, \( h_1-h_2 \) 9.

**Venter.** As in female. Lengths of intercoxal setae, \( l a \) 47, \( 3a \) 54, \( 4a \) 47. Anogenital pore terminal, genital setae absent, with 3 pairs of paraproctal setae, \( ps_1 \) very small, peg-like, \( ps_3 \) 4, \( ps_2 \) 4, \( ps_1 \) 2. Three pairs of aggenital setae, \( ag_1 \) 15, \( ag_2 \) 14, \( ag_3 \) 15.

**Legs.** Lengths I-IV: 115, 98, 92, 105. Counts of setae and solenidia similar to female except on tarsi I-IV: \( 8+1\omega+1\omega^* \), \( 8+1\omega+1\omega^* \), \( 6+1\omega+1\omega^* \), \( 6+1\omega+1\omega^* \); \( I\omega \) 10, \( \omega^* \) 10, \( II\omega \) 11, \( \omega^* \) 11, \( III\omega \) 4.5, \( \omega^* \) 11, \( IV\omega \) 4.5, \( \omega^* \) 11.

**FIGURES** 19-23. *Saniosulus molliculus* sp. nov. (19-21, female; 22-23, male). 19-21, leg II-IV, respectively; 22-23, solenidia on tarsi I-II, respectively.
PROTONYMPH. Idiosoma length 180, width 140. \(n=1\)

_Gnathosoma._ Setation and solenidia on papi similar to in female. Subcapitulum with 1 pair of setae, \(m = 11\).

_Dorsum._ With 13 pairs of dorsal body setae. Lengths of setae: \(vi\), ve 6, sci 10, sce 11, \(c_1\) 8, \(c_2\) 9, \(d_1\) 8, \(d_2\) 8, \(e_1\) 7, \(e_2\) 8, \(f_1\) 18, \(h_1\) 14, \(h_2\) 16.

_Venter._ With 2 pairs of ventral setae, the third pair, \(4a\), absent. With 1 pair of aggenital setae, \(ag_1\) 8. Genital setae absent. Anal pore bearing 3 pairs of paraproctal setae, \(ps_3\) 7, \(ps_2\) 9, \(ps_1\) 9.

_Legs._ Lengths I-IV: 92, 72, 80, 81. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 0, trochanters 0, 0, 0, 0, femora 4, 4, 2, 1, genua 1+1\(\kappa\), 0, 0, 0, tibiae 5+1\(\varphi\rho\), 4+1\(\varphi\rho\), 4+1\(\varphi\rho\), 4+1\(\varphi\rho\), tarsi 10+1\(\omega\), 8+1\(\omega\), 6+1\(\omega\), 6+1\(\omega\).

_Etymology._ The specific name _molliculus_ is from the Latin _molli_ (soft) and _iculus_ (small), referring to the soft body.

_Type material._ Holotype female, fallen leaves, Fuzhou, 1995. IX. 29, Q.-H. Fan. Paratype male, and 1 protonymph, same data as holotype.

_Remarks._ This new species is similar to _S. nudus_ Summers, but it can be distinguished by (1) having a solenidion on tarsus IV (_S. nudus_ without this solenidion), (2) having 2 setae on palptibia (_S. nudus_ has 3 setae) and (3) having a dorsal shield between setae \(e_1\) and \(f_1\) (_S. nudus_ without this shield).

Saniosulus longidius sp. nov. (Figs. 24-32)

_FEMALE._ Idiosoma length 416, width 213. \(n=1\)

_Gnathosoma._ Cheliceral stylophore 82 (including digits) long. Length of movable digit 54. Palpus 75 long, with a small tibial claw. Counts of setae and solenidia on palpi: 0, 2, 1, 2+1 claw, 4+1\(\omega\)+1 terminal spine +1 eupathidium. Eupathidium rod-like, simple. Subcapitulum with 2 pairs of setae, \(m = 20\), \(n = 15\); distances between setae, \(m-m\) 10, \(n-n\) 31.

_Dorsum._ Covered by longitudinal striae in most areas. Propodosoma with a pair of minute shields between setae ve. Opisthosoma with
a small somewhat trapezoidal shield between setae $e_1$ and $f_1$. Suranal shield developed. Postocular body large, approximately 2.5 times diameter of eye. Dorsum bearing 13 pairs setae, setae $f_1$, $h_1$ and $h_2$ much longer than others. Lengths of setae: $vi$ 9, $ve$ 10, $sci$ 12, $sce$ 19, $c_1$ 12, $c_2$ 18, $d_1$ 11, $d_2$ 19, $e_1$ 10, $e_2$ 12, $f_1$ 28, $h_1$ 23, $h_2$ 25. Distances between setae: $vi$-$vi$ 38, $vi$-$ve$ 7, $ve$-$ve$ 47, $ve$-$sci$ 45, $sci$-$sce$ 20, $c_1$-$c_1$ 90, $c_1$-$c_2$ 63, $c_1$-$d_1$ 65, $d_1$-$d_2$ 47, $d_1$-$e_1$ 79, $e_1$-$e_1$ 41, $e_1$-$e_2$ 42, $e_1$-$f_1$ 16, $f_1$-$f_1$ 49, $h_1$-$h_1$ 30, $h_1$-$h_2$ 23.

**Venter.** With 3 pairs whip-like intercoxal setae, the second pair the longest, about twice the length of the third pair, lengths: $1a$ 56, $3a$ 64, $4a$ 35. Genital pore bearing 1 pair of setae, 16 long. Aggenital area with 3 pairs of setae, the first pair $ag_1$ far exceeding bases of the second pair. Lengths: $ag_1$ 26, $ag_2$ 18, $ag_3$ 22. Anal pore bearing 3 pairs of paraproctal setae, $ps_3$ 15, $ps_2$ 21, $ps_1$ 18.

**Legs.** Lengths I-IV (from base of trochanter to tip of tarsal claw): 131, 105, 112, 118. Each tarsus with 1 solenidion $\omega$. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 2, trochanters 1, 1, 1, 0, femora 4, 4, 2, 2, genua 1+1$\kappa$, 1, 1, 1, tibiae 5+1$\phi\rho$, 4+1$\phi\rho$, 4+1$\phi\rho$, tarsi 10+1$\omega$, 8+1$\omega$, 6+1$\omega$, 6+1$\omega$. Lengths of solenidia on tarsi: I$\omega$ 9, II$\omega$ 12, III$\omega$ 5, IV$\omega$ 4.

**DEUTONYMPH.** Idiosoma length 319, width 158. ($n=1$)

**Gnathosoma.** Setae and solenidia on palpus similar to in female. Subcapitulum with 2 pairs of setae, $m$ 13, $n$14; distances between setae $m$-$m$ 10, $n$-$n$ 27.

**Dorsum.** With 13 pairs of dorsal body setae. Lengths of setae: $vi$ 8, $ve$ 9, $sci$ 11, $sce$ 16, $c_1$ 9, $c_2$ 13, $d_1$ 7, $d_2$ 13, $e_1$ 9, $e_2$ 9, $f_1$ 25, $h_1$ 20, $h_2$ 20. Distances between setae: $vi$-$vi$ 32, $vi$-$ve$ 38, $ve$-$sci$ 33, $sci$-$sce$ 16, $c_1$-$c_1$ 65, $c_1$-$c_2$ 52, $c_1$-$d_1$ 54, $d_1$-$d_2$ 41, $d_1$-$e_1$ 36, $e_1$-$e_1$ 35, $e_1$-$e_2$ 27, $e_1$-$f_1$ 15, $f_1$-$f_1$ 40, $h_1$-$h_1$ 25, $h_1$-$h_2$ 15.

**Venter.** With 3 pairs of intercoxal setae, the first and second pairs about equal in length, approximately 5 times the length of the third pair. Lengths: $1a$ 59, $3a$ 57, $4a$ 11. Genital setae absent. With 3 pairs of aggenital setae, the first pair, $ag_1$, nearly reaching bases of the second
pair. Lengths: \(ag_1\) 9, \(ag_2\) 10, \(ag_3\) 9. Anal pore bearing 3 pairs of paraproctal setae, \(ps_3\) 8, \(ps_2\) 13, \(ps_1\) 13.

**FIGURES 24-32.** Saniosulus longidius sp. nov. (female). 24, dorsum; 25, chelicera; 26, palp; 27, anogenital area; 28, intercoxal setae \(1a\), \(3a\), \(4a\); 29, leg I; 30-32, solenidia on tarsi II-IV, respectively.

*Legs.* Lengths I-IV: 114, 96, 97, 98. Counts of setae and solenidia on legs as in female except that genua IV are without setae. Lengths of solenidia on tarsi: \(I\omega\) 7, \(II\omega\) 9, \(III\omega\) 4, \(IV\omega\) 3.5.

*Etymology.* The specific name *longidius* is from the Latin *longus* (long) and *idius* (small), referring to the body shape.
Type material. Holotype female, Chengyang, Fuan, 1997. X. 30, Q.-Y. Liu, 1 deutonymph, similar to holotype.

Remarks. This new species is similar to *S. molliculus* sp. nov. in the number of setae and solenidia on the legs, but it can be distinguished by having (1) a pair of minute propodosomal shields between setae ve (*S. molliculus* is without a propodosal platelet between setae ve), (2) a trapezoidal shield between setae e₁ (shield triangular in *S. molliculus*) and (3) setae 4a approximately half as long as the second pairs (1a ≈ 3a ≈ 4a in *S. molliculus*).

*Saniosulus yonganensis* sp. nov. (Figs. 33-40)

**FEMALE.** Idiosoma length 336, width 182. (n=1)

*Gnathosoma.* Cheliceral stylophore length 83 (including digits), movable digit 45. Palpus 71 long, with a small tibial claw. Counts of setae and solenidia on palpi: 0, 2, 1, 2+1 claw, 4+1ω+1 terminal spine +1 eupathidium. Eupathidium simple, rod-like. Subcapitulum bears 2 pairs of setae, subequal in length, m = 15, n = 16; distances between setae, m-m 8, n-n 26.

*Dorsum.* Most areas striated longitudinally. Propodosoma without shield between setae ve. Opisthosoma bears a pair of very small shields between setae e₁ and f₁. Suranal shield developed. Postocular body small, nearly 1.3 times diameter of eye. Dorsum with 13 pairs setae, setae f₁, h₁ and h₂ much longer than others. Lengths of setae: vi 7, ve 8, sci 11, sce 11, c₁ 11, c₂ 14, d₁ 11, d₂ 12, e₁ 10, e₂ 10, f₁ 18, h₁ 18, h₂ 20. Distances between setae: vi-vi 26, vi-ve 10, ve-ve 32, ve-sci 23, sci-sce 20, c₁-c₁ 64, c₁-c₂ 43, c₁-d₁ 56, d₁-d₁ 36, d₁-d₂ 53, d₁-e₁ 55, e₁-e₁ 29, e₁-e₂ 37, e₁-f₁ 15, f₁-f₁ 45, h₁-h₁ 18, h₁-h₂ 16.

*Venter.* With 3 pairs of whip-like intercoxal setae, the third pair much shorter, approximately one half the Lengths of the first and second pairs. Lengths: 1a 65, 3a 62, 4a 33. Genital pore with 1 pair of setae, length 11. Aggenital area with 3 pairs of setae, the first pair **ag**₁
extends to the bases of the second pair. Lengths: $ag_1$ 13, $ag_2$ 13, $ag_3$ 14. Anal pore bears 3 pairs of paraproctal setae, $ps_3$ 12, $ps_2$ 15, $ps_1$ 15.

**FIGURES 33-40.** Saniosulus yonganensis sp. nov. (female). 33. dorsum; 34. palp; 35. anogenital area; 36. intercoxal setae 1a, 3a, 4a; 37. leg I; 38-40. solenidia on tarsi II-IV, respectively.

*Legs.* Lengths I-IV: 125, 92, 93, 102. Each tarsus with 1 solenidion $\omega$. Counts of setae and solenidia on legs I-IV: coxae 2, 1, 2, 2, trochan-
ters 1, 1, 1, 0, femora 4, 4, 2, 2, genua 1+1κ, 1, 1, 1, tibiae 5+1ρρ, 4+1ρρ, 4+1ρρ, 4+1ρρ, tarsi 9+1ω, 8+1ω, 6+1ω, 6+1ω. Lengths of solenidia on tarsi: Iω 8, IIω 11, IIIω 4.5, IVω 4.

Etymology. The species is named for Yongan county where the species was collected.


Remarks. The new species is similar to S. nudus Summers in dorsal body striation, but can be distinguished by having a solenidion on tarsus IV and 2 setae on the palptibia (S. nudus lacks the solenidion on tarsus IV, with 3 setae on palptibia). This new species is also close to S. molliculus sp. nov. in the number of setae and solenidia on the legs, but differs in: opisthosoma with a pair of minute shields between setae e1 (S. molliculus with one triangular shield) and in the third pair of intercoxal setae being approximately half as long as the other 2 pairs (1a = 3a ≈ 4a in S. molliculus).

Key to species of genus Saniosulus

1. Palpgenu with 1 seta; tarsus IV with 1 solenidion ...................... 2
   - Palpgenu with 2 setae; tarsus IV without solenidion ................
     ................................................................. S. nudus Summers 1960
2. Opisthosomal shields minute, no more than one half length of setae f1; tarsus I with 9 setae and 1 solenidion ......................... 3
   - Opisthosomal shield extends the length of setae f1; tarsus I with 10 setae and 1 solenidion .............................................. 4
3. Ventral setae 1a and 3a long, nearly twice length of 4a .........
   ................................................................. S. yonganensis sp. nov.
   - Ventral setae 1a and 4a short, about 1 half the length of 3a.....
     ................................................................. S. gersoni Hu & Liang 1995
4. Propodosomal shield 1 pair; opisthosomal shield trapezoidal, with a concaved area ........................................................ S. longidius sp. nov.
   - Without propodosomal shield; opisthosomal shield triangular...
     ................................................................. S. molliculus sp. nov.
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References


福建毛竹上的缝颚螨
（蜱螨亚纲；螨螨亚目）

范青海
（福建省农业大学植保系，福州 350002）
张艳璇
（福建省农科院植保所，福州 350013）
刘巧云
（福建省林业厅森防站，福州 350003）

摘要：在福建省毛竹林螨类调查期间，发现 4 种长须螨和 3 种小真螨螨，其中 4 种为新种：叉毛刺芹螨 Eryngiopus dicrotrichus sp. nov., 软裸浆螨 Saniosulus molliculus sp. nov., 长裸浆螨 Saniosulus longidius sp. nov., 永安裸浆螨 Saniosulus yonganensis sp. nov.

关键词：毛竹，缝颚螨总科，新种，中国福建