

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

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Abstract

During an investigation of mites living on bamboo (*Phyllostachys pubescens*) in Fujian Province, four stigmatid and three eupalopsellid mites (Raphignathoidea) were found, among which 4 species, namely *Eryngiopus dicotrichus*, *Saniusulus 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 raphignathoid mite species (four of the Stigmatidae 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**

Agistemus divisus Gonzalez, 1965, *University of California Publications in Entomology*, 41: 44. New to mainland of China.

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: $vi/vi-vi = 1$, $c_1/c_1-c_1 = 0.5$, $c_1-c_1/e_1-e_1 = 1.2$, $ve/sci = 1.1$. 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 κ , 1, 0, 0, tibiae 5+1 $\phi\rho$, 5+1 $\phi\rho$, 5+1 $\phi\rho$, 5+1 $\phi\rho$, tarsi 12+1 ω , 9+1 ω , 7+1 ω , 7. Length of solenidia on tarsi: I ω 26, II ω 31, III ω 19.

Samples examined. 5 females, 1 protonymph, Qunxian, Nanping, Fujian, China, 1997. VIII. 20, Y.-X. Zhang. 1 female, Ansha, Yongan, Fujian, China, 1997. X. 4, Y.-X. Zhang. 1 female, Nanyang, Shouning, Fujian, China, 1997. X. 17, Y.-X. Zhang.

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

***Agistemus huangshanensis* Hu & Hu**

Agistemus huangshanensis Hu & Hu, 1997, *Acta Zootaxonomica Sinica*, 23(1): 57.

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 seta lengths: $vi/vi-vi = 2.7$, $c_1/c_1-c_1 = 1.7$, $c_1-c_1/e_1-e_1 = 1$, $ve/sci = 1.3$. 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**

Zetzellia lushanensis Hu & Chen, 1992, *Acta Arachnologica Sinica*, 1(1): 39.

Zetzellia huaxiensis Hu, 1996, *Acta Zootaxonomica Sinica*, 21(1): 70. **syn.**

nov.

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+1 κ , 1, 0, 0, tibiae 5+1 $\phi\phi$, 5+1 $\phi\phi$, 5+1 $\phi\phi$, 5+1 $\phi\phi$, tarsi 13+1 ω , 9+1 ω , 7+1 ω , 7+1 ω . Ratio of dorsal setae in male: $vi/vi-vi = 0.7$, $ve/ve-sci = 1$, $sci/c_2 = 1.1$, $h_1/h_2 = 0.7$; $c_1-c_1 : d_1-d_1 : e_1-e_1 : f_1-f_1 = 1.2 : 1.6 : 1 : 1.2$.

Samples examined. 2 females, Huaxi, Guizhou, Guizhou, China, 1983-X-12, C.-Y. Hu. 1 female, Haihui, Jiangxi, ex *Camellaceae oleifera* Abel, 1985. VI. 25, D.-M. Yan., 1 female, Longxishan Mountain, Liancheng, Fujian, China, 1997. VIII. 20, Q.-Y. Liu. 1 female, Lingtong, Lianjiang, Fujian, China, 1997. X. 17, Y.-X. Zhang. 1 female, Nanyang, Shouning, Fujian, China, 1997. X. 17. Yongfu, Zhangping, Fujian, China, 1997-X-7, Y.-X. Zhang.

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 tatus): 0, 3, 1, 3+1 claw, 4+1 ω +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).

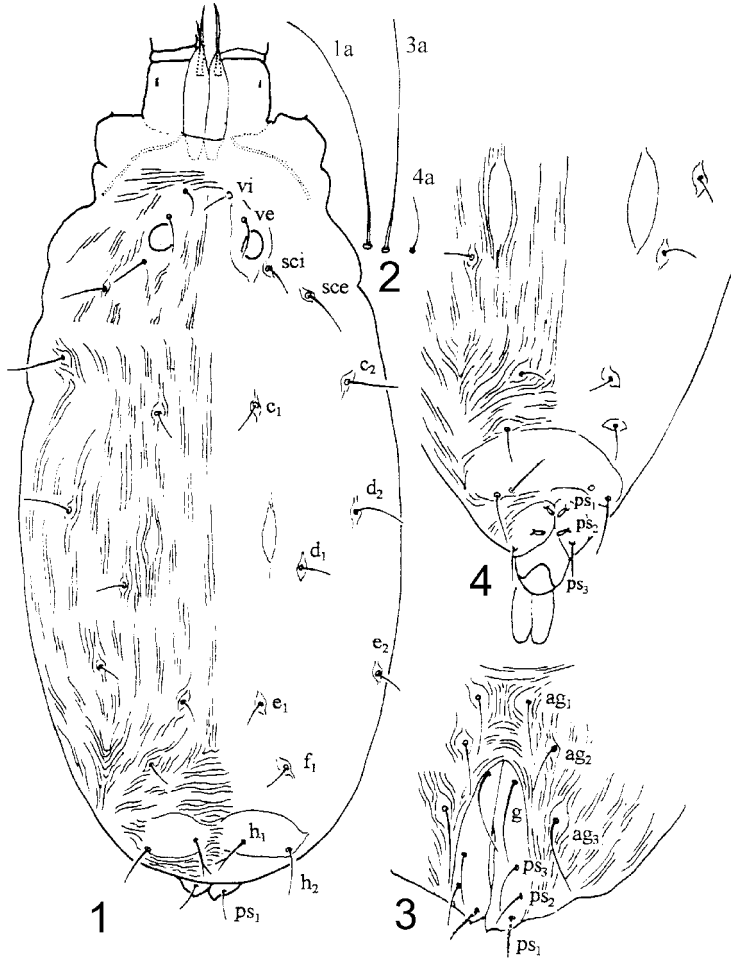
Venter. Without intercoxal shields. Membrane between coxae bearing 3 pairs of setae, anterior 2 pairs ultra-long, more than 4 times as long as third pair, *1a* 69 (69-72), *3a* 67 (67-74), *4a* 15 (15-18). Genital pore bearing 1 pair of setae, *g* 25 (23-25). Three pairs of aggenital setae situated on 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 ω . 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 κ , 1, 0, 0, tibiae 5+1 $\phi\phi$, 5+1 $\phi\phi$, 5+1 $\phi\phi$, 5+1 $\phi\phi$, tarsi 13+1 ω , 9+1 ω , 7+1 ω , 7+1 ω . Lengths of solenidia on tarsi: I ω 4 (4-5), II ω 4 (4-5), III ω 2.5 (2-3), IV ω 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.

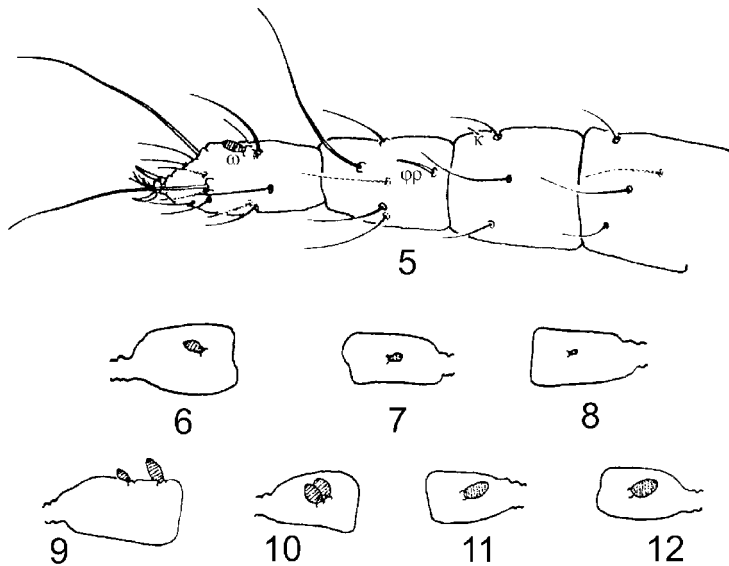
Dorsum. Similar to female in the number and shape of setae. Ratio *ve/sci* = 1.2, *ve/sce* = 0.9, *ve/c*₂ = 0.7, *c*₁-*c*₁ : *d*₁-*d*₁ : *e*₁-*e*₁ : *f*₁-*f*₁ = 1.5 : 2.4 : 1 : 1.3; Lengths of setae: *vi* 9 (8-9), *ve* 12 (12-13), *sci* 10 (10-11), *sce* 14 (14), *c*₁ 9 (9-10) *c*₂ 17 (16-17), *d*₁ 8 (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 dicotrichus* 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: $13+1\omega+1\omega^\sigma$, $9+1\omega+1\omega^\sigma$, $7+1\omega$, $7+1\omega^\sigma$. Lengths of solenidia on tarsi, $I\omega$ 4 (4-4.5), ω^σ 6 (6), $II\omega$ 5 (5-6), ω^σ 5 (5-6), $III\omega$ 6 (6-7), $IV\omega$ 7 (7).



FIGURES 5-12. *Eryngiopus dicotrichus* 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 paraproctal 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 $5+1\phi\rho$, $5+1\phi\rho$, $5+1\phi\rho$, $5+1\phi\rho$, tarsi $13+1\omega$, $9+1\omega$, $7+1\omega$, $6+1\omega$. Lengths of solenidia on tarsi: I ω 4, II ω 3, III ω 2, IV ω 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. ($n=1$)

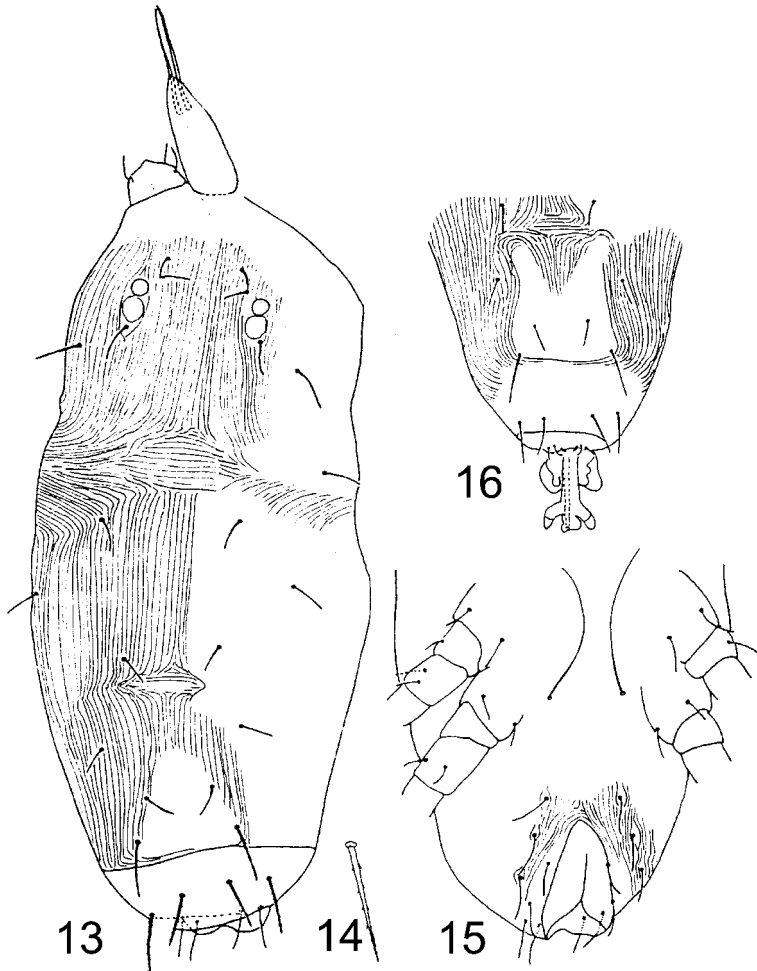
Gnathosoma. Chelicerae fused and forming a long stylophore, 82 (including digits). Movable digits 49 long. Palpus 69 long, with a small tibial claw. Counts of setae and solenidia on palpi: 0, 2, 1, 2+1 claw, 4+1 ω +1 terminal spine +1 eupathidium. Eupathidium rod-like, simple. Subcapitulum bearing 2 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_1 53, c_1-c_2 38, c_1-d_1 51, c_1-d_2 37, 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.

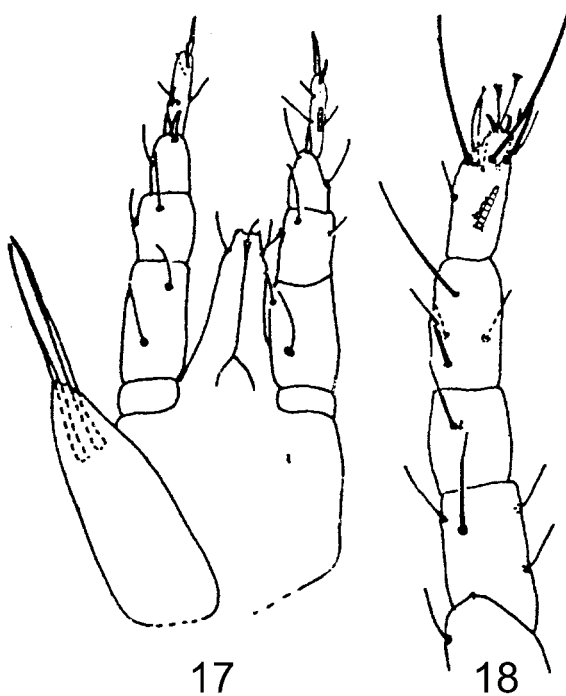
Venter. Without shields. Three pairs of intercoxal setae whip-like, ultra-long, the first and third pairs approximately equal in length and slightly shorter than the second pair, $1a$ 55, $3a$ 60, $4a$ 55. Genital pore bearing 1 pair of setae, 13 long. Aggenital area with 3 pairs of setae and the first 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 solenidion 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+1 κ , 1, 1, 1, tibiae 5+1 $\phi\phi$, 4+1 $\phi\phi$, 4+1 $\phi\phi$,

4+1 ϕ ρ , tarsi 10+1 ω , 8+1 ω , 6+1 ω , 6+1 ω . Lengths of solenidia on tarsi: I ω 8, II ω 9, III ω 4, IV ω 4.5.



FIGURES 13-16. *Saniosulus molliculus* **sp. nov.** (13-15, female; 16, male). 13. dorsum; 14. dorsal seta f_1 ; 15. anogenital area; 16. opisthosoma.



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

MALE. Idiosoma 294 long, 123 wide.

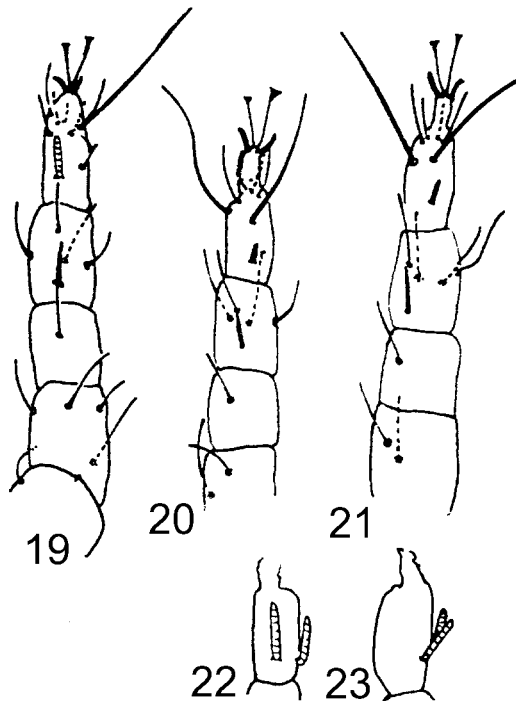
Gnathosoma. Chelicerae 72 long. Palp 69 long. Seta on dorsal side of palpfemur palm-like. Counts of setae and solenidia on palpi similar to female. Subcapitulum bearing 2 pairs of setae, $m = 14$, $n = 14$; distances between $m-m$ 14, $n-n$ 29.

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, $1a$ 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: $8+1\omega+1\omega^\sigma$, $8+1\omega+1\omega^\sigma$, $6+1\omega+1\omega^\sigma$, $6+1\omega+1\omega^\sigma$; I ω 10, ω^σ 10, II ω 11, ω^σ 11, III ω 4.5, ω^σ 11, IV ω 4.5, ω^σ 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 6, 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 κ , 0, 0, 0, tibiae 5+1 $\phi\phi$, 4+1 $\phi\phi$, 4+1 $\phi\phi$, 4+1 $\phi\phi$, tarsi 10+1 ω , 8+1 ω , 6+1 ω , 6+1 ω .

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 ω +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_1 47, d_1-d_2 66, 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 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+1 κ , 1, 1, 1, tibiae 5+1 $\phi\phi$, 4+1 $\phi\phi$, 4+1 $\phi\phi$, 4+1 $\phi\phi$, tarsi 10+1 ω , 8+1 ω , 6+1 ω , 6+1 ω . Lengths of solenidia on tarsi: I ω 9, II ω 12, III ω 5, IV ω 4.

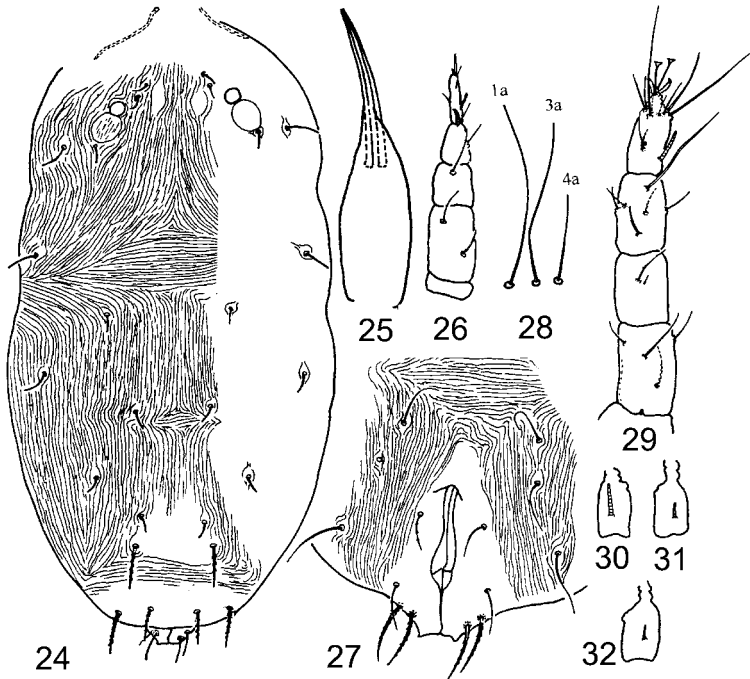
DEUTONYMPH. Idiosoma length 319, width 158. ($n=1$)

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, $vi-ve$ 7, $ve-ve$ 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_1 41, d_1-d_2 55, 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 ω 7, II ω 9, III ω 4, IV ω 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 *e*₁ (shield triangular in *S. molliculus*) and (3) setae *4a* approximately half as long as the second pairs (*1a* \approx *3a* \approx *4a* in *S. molliculus*).

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

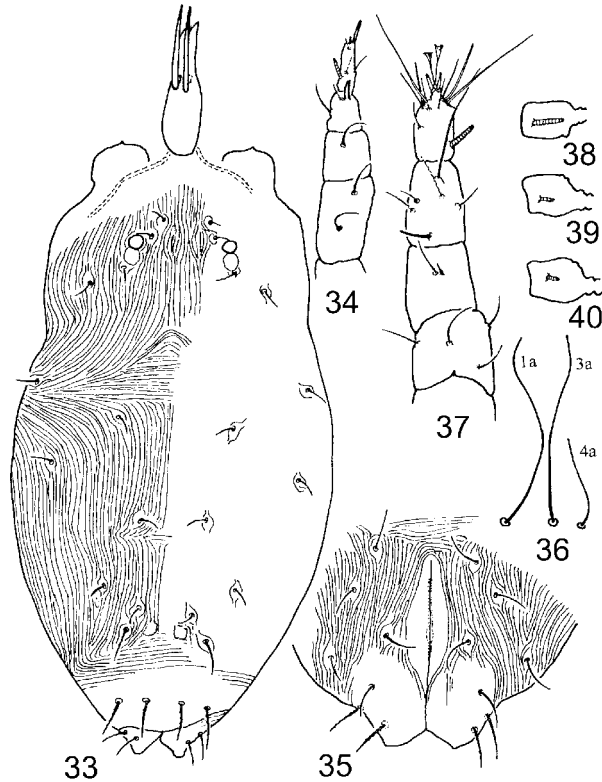
FEMALE. Idiosoma length 336, width 182. (*n*=1)

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+1 ω +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 *e*₁ and *f*₁. Suranal shield developed. Postocular body small, nearly 1.3 times diameter of eye. Dorsum with 13 pairs setae, setae *f*₁, *h*₁ and *h*₂ much longer than others. Lengths of setae: *vi* 7, *ve* 8, *sci* 11, *sce* 11, *c*₁ 11, *c*₂ 14, *d*₁ 11, *d*₂ 12, *e*₁ 10, *e*₂ 10, *f*₁ 18, *h*₁ 18, *h*₂ 20. Distances between setae: *vi-vi* 26, *vi-ve* 10, *ve-ve* 32, *ve-sci* 23, *sci-sce* 20, *c*_{1-c}₁ 64, *c*_{1-c}₂ 43, *c*_{1-d}₁ 56, *d*_{1-d}₁ 36, *d*_{1-d}₂ 53, *d*_{1-e}₁ 55, *e*_{1-e}₁ 29, *e*_{1-e}₂ 37, *e*_{1-f}₁ 15, *f*_{1-f}₁ 45, *h*_{1-h}₁ 18, *h*_{1-h}₂ 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 ω . 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+1 κ , 1, 1, 1, tibiae 5+1 $\phi\phi$, 4+1 $\phi\phi$, 4+1 $\phi\phi$, 4+1 $\phi\phi$, tarsi 9+1 ω , 8+1 ω , 6+1 ω , 6+1 ω . Lengths of solenidia on tarsi: I ω 8, II ω 11, III ω 4.5, IV ω 4.

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

Type material. Holotype female, Shengqing, Yongan, 1997. X. 30, Liu.

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 e_1 (*S. molliculus* with one triangular shield) and in the third pair of intercoxal setae being approximately half as long as the other 2 pairs ($1a \approx 3a \approx 4a$ 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 f_1 ; tarsus I with 9 setae and 1 solenidion 3
 - Opisthosomal shield extends the length of setae f_1 ; 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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Abstract in Chinese

**福建毛竹上的缝颚螨
(蜱螨亚纲: 辐螨亚目)**

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摘要: 在福建省毛竹林螨类调查期间, 发现 4 种长须螨和 3 种小真古螨, 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

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