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Eriophyoid Mites of Taiwan: Description of Twenty Species of Phyllocoptini from Hueysuen (Acari: Eriophyoidea: Phyllocoptinae)【Research report】

臺灣產節蜱：描述二十種惠蓀林場葉刺節蜱族 (瑞蜱亞綱：節蜱總科：葉刺節蜱亞科)【研究報告】

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Abstract

In this work, we describe and illustrate 20 species of Phyllocoptini in 11 genera, including two new genera, 12 new species, one new combination and seven known species, from Hueysuen, central Taiwan. They are: 1. Prominens taiwanensis gen. et sp. nov. (infesting Pasania harlandii), 2. Setosecundus formosanus gen. et sp. nov. (infesting Styrax formosana), 3. Phyllocoptruta peregi sp. nov. (infesting Pasania konishii), 4. Phyllocoptruta dimidius sp. nov. (infesting Sapium discolor), 5. Phyllocoptruta semialatae Huang, 1992 (infesting Rhus semialata var. roxburghiana), 6. Cupacarus hebes Huang, 2001 (infesting Cunninghamia lanceolata), 7. Neoleipothrix superbae sp. nov. (infesting Schima superba var. superba), 8. Neoleipothrix leptae sp. nov. (infesting Evodia lepta), 9. Neoleipothrix virgatus sp. nov. (infesting Styrax formosana), 10. Calepitrimerus octophyllaus sp. nov. (infesting Scheffera octophylla), 11. Calepitrimerus undatus sp. nov. (infesting Stephania japonica), 12. Calepitrimerus litseaus sp. nov. (infesting Litsea kostermansii), 13. Calepitrimerus heliciopsus Chandrapatya & Boczek, 2000 (infesting Helicia formosana), 14. Glossilus yubimus (Huang, 1996) comb. nov. (infesting Cunninghamia lanceolata), 15. Epitrimerus lobatiae Huang, 2001 (infesting Pueraria montana), 16. Epitrimerus irisanus sp. nov. (infesting Ficus irisana), 17. Vasates irisanae Huang, 1992 (infesting Polygonum chinease and Ficus irisana), 18. Vasates digressio sp. nov. (infesting Pasania harlandii), 19. Monotrymacus ternatus Huang, 2001 (infesting Turpinia ternata), and 20. Phyllocoptes multilinea Huang, 2001 (infesting Pueraria montana). A key to the genera and species of the Phyllocoptini from Hueysuen is provided.

摘要

本文描述及繪圖11屬、20種惠蓀林場葉刺節蜱族，其中包含2新屬、12新種及8舊有種。分別為：Prominens taiwanensis gen. et sp. nov. 為害短尾葉石櫟 (Pasania harlandii), Setosecundus formosanus gen. et sp. nov. 為害烏皮九芎 (Styrax formosana), Phyllocoptruta peregi sp. nov. 為害小西氏石櫟 (Pasania konishii), Phyllocoptruta dimidius sp. nov. 為害白臼 (Sapium discolor), Phyllocoptruta semialatae Huang, 1992 為害羅氏鹽膚木 (Rhus semialata var. roxburghiana), Cupacarus hebes Huang, 2001 為害福州杉 (Cunninghamia lanceolata), Neoleipothrix superbae sp. nov. 為害木荷 (Schima superba var. superba). Neoleipothrix leptae sp. nov. 為害三叉虎(Evodia lepta), Neoleipothrix virgatus sp. nov. 為害烏皮九芎(Styrax formosana), Calepitrimerus octophyllaus sp. nov. 為害江某(Scheffera octophylla), Calepitrimerus undatus sp. nov. 為害千金藤 (Stephania japonica), Calepitrimerus litseaus sp. nov. 為害小梗黃肉楠 (Litsea kostermansii), Calepitrimerus heliciopsus Chandrapatya & Boczek, 2000 為害山龍眼 (Helicia formosana), Glossilus yubimus (Huang, 1996) 為害福州杉 (Cunninghamia lanceolata), Epitrimerus lobatiae Huang, 2001 為害葛藤 (Pueraria montana), Epitrimerus irisanus sp. nov. 為害澀葉榕 (Ficus irisana), Vasates irisanae Huang, 1992 為害澀葉榕(Ficus irisana)及火炭母草 (Polygonum chinease), Vasates digressio sp. nov. 為害短尾葉石櫟(Pasania harlandii), Monotrymacus ternatus Huang, 2001 為害臺灣山香圓 (Turpinia ternata) 及Phyllocoptes multilinea Huang, 2001為害葛藤(Pueraria montana)。本文並對惠蓀林場產葉刺節蜱族的種做一檢索表。

Key words: Phyllocoptini, new genus, Hueysuen, Taiwan
關鍵詞: 葉刺節蜱族、新屬、惠蓀、臺灣

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Eriophyoid Mites of Taiwan: Description of Twenty Species of Phyllocoptini from Hueysuen (Acari: Eriophyoidea: Phyllocoptinae)

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ABSTRACT

In this work, we describe and illustrate 20 species of Phyllocoptini in 11 genera, including two new genera, 12 new species, one new combination and seven known species, from Hueysuen, central Taiwan. They are: 1. *Prominens taiwanensis* gen. et sp. nov. (infesting *Pasania harlandii*), 2. *Setosecundus formosanus* gen. et sp. nov. (infesting *Styrax formosana*), 3. *Phyllocoptruta peregi* sp. nov. (infesting *Pasania konishii*), 4. *Phyllocoptruta dimidius* sp. nov. (infesting *Sapium discolor*), 5. *Phyllocoptruta semialatae* Huang, 1992 (infesting *Rhus semialata* var. *roxburghiana*), 6. *Cupacarus hebes* Huang, 2001 (infesting *Cunninghamia lanceolata*), 7. *Neoleipothrix superbae* sp. nov. (infesting *Schima superba* var. *superba*), 8. *Neoleipothrix leptae* sp. nov. (infesting *Evodia lepta*), 9. *Neoleipothrix virgatus* sp. nov. (infesting *Styrax formosana*), 10. *Calepitrimerus octophyllaus* sp. nov. (infesting *Scheffera octophylla*), 11. *Calepitrimerus undatus* sp. nov. (infesting *Stephania japonica*), 12. *Calepitrimerus litseaus* sp. nov. (infesting *Litsea kostermansii*), 13. *Calepitrimerus heliciopsus* Chandrapatya & Boczek, 2000 (infesting *Helicia formosana*), 14. *Glossilus yubimus* (Huang, 1996) comb. nov. (infesting *Cunninghamia lanceolata*), 15. *Epitrimerus lobatiae* Huang, 2001 (infesting *Pueraria montana*), 16. *Epitrimerus irisanus* sp. nov. (infesting *Ficus irisana*), 17. *Vasates irisanae* Huang, 1992 (infesting *Polygonum chinease* and *Ficus irisana*), 18. *Vasates digressio* sp. nov. (infesting *Pasania harlandii*), 19. *Monotrymacus ternatus* Huang, 2001 (infesting *Turpinia ternata*), and 20. *Phyllocoptes multilinea* Huang, 2001 (infesting *Pueraria montana*). A key to the genera and species of the Phyllocoptini from Hueysuen is provided.

Key words: Phyllocoptini, new genus, Hueysuen, Taiwan

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Introduction

This paper is the sixth part of a series of taxonomic work on Eriophyoid mites from Hueysuen Experimental Forest, Nantou County, central Taiwan. The mites belong to 11 genera of the Phyllocoptini. Among them, one species belongs to *Prominens*, one species to *Setosecundus*, three species to *Phyllocoptruta*, one species to *Glossilus*, one species to *Cuparacarus*, one species to *Phyllocoptes*, three species to *Neoleipothrix*, four species to *Calepitrimerus*, two species to *Epitrimerus*, two species to *Vastes*, and one species to *Monotrymaus*.

The tribe Phyllocoptini was established by Nalepa under the subfamily Phyllocoptinae in 1892. It is a large tribe of the Phyllocoptinae with about 546 species in 53 genera known from different parts of the globe and to infest different host plants.

To date, 49 species of Phyllocoptini have been recorded in Taiwan. Among them, five species belong to *Phyllocoptruta*, six species to *Phyllocoptes*, eight species to *Neoleipothrix*, eight species to *Calepitrimerus*, 10 species to *Epitrimerus*, three species to *Vastes*, one species to *Monotrymaus*, one species to *Neometaculus*, one species to *Cupacarus*, one species to *Dicruvasates*, one species to *Proiectus*, one species to *Soleula*, one species to *Glossilus*, one species to *Prominens*, and one species to *Setosecundus*.

Specimens are deposited in the National Museum of Natural Science (NMNS), Taichung, Taiwan. All measurement units are in micrometers (μm). The terminology and abbreviations in the diagrams follow those of Lindquist (1996) and Huang (1999).

In the text, measurement of the oblique distance between tubercles is indicated by a backslash (\), and that of the straight distance between tubercles is indicated by a dash (-).

Key to Species of the Phyllocoptini from Hueysuen, Taiwan
(modified from Amrine, 1996)

1. Anterodorsal opisthosoma with broad plate ----------
   Prominens taiwanensis gen. et sp. nov.
-. Anterodorsal opisthosoma without plate ----------2.
2. Dorsum of opisthosoma with median ridge or evenly arched ----------3.
-. Dorsum of opisthoma with wide longitudinal furrow----------4.
3. Dorsum of opisthosmoma with a median ridge ----------8.
-. Dorsum of opisthosoma evenly arched behind prodorsal shield, somewhat flattened in some genera ----------18.
4. Opisthosomal seta d absent; coxa I sternal line absent----------
   Setosecundus formosanus gen. et sp. nov.
-. Opisthosomal seta normal ----------5.
5. Median longitudinal furrow wide ----6.
-. Median longitudinal furrow narrow---
   ----------*Cupacarus hebes* Huang, 2001
6. Prodorsal shield design with median line complete; empodium 5-rayed ------
   ----------*Phyllocoptruta peregi* sp. nov.
-. Prodorsal shield design with imcomplete median line ----------7.
7. Prodorsal shield design with admedian lines connected at base; empodium 6-rayed----------
   -------*Phyllocoptruta dimidius* sp. nov.
-. Prodorsal shield design with admedian line diverging to rear; empodium 5-rayed ----------
   Phyllocoptruta semialatae Huang, 1992
8. Femoral setae absent ----------9.
-. Femoral setae present ----------11.
9. Prodorsal shield design smooth ---------
   ---------*Neoleipothrix superbae* sp. nov.
-. Prodorsal shield design with ridges10.
10. Coverflap smooth; coxal area smooth
    ---------- *Neoleipothrix leptae* sp. nov.
-. Coverflap with longitudinal ridges in 2 rows; coxal area with dashed lines
   ----------*Neoleipothrix virgatus* sp. nov.

11. Prodorsal shield with an elongate, median pit between scapular setae; 1st opisthosomal annulus broad and fused to rear of prodorsal shield--------
-*Monotrymacus ternatus* Huang, 2001
-. Prodorsal shield without pits; 1st opisthosomal annulus similar to others---------- 12.
12. Middorsal opisthosomal ridge ending in broad furrow before end of submedian ridges ---------- 13.
-. Median opisthosomal ridge fading with submedian or lateral ridges; shallow submedian furrows often with weak median ridge ---------- 16.
13. Prodorsal shield design with granules or dashed lines---------- 14.
-. Prodorsal shield design with longitudinal ridges ---------- 15.
14. Prodorsal shield design with granules; dorsal opisthosomal annuli even -------
--*Calepitrimerus octophyllaus* sp. nov.
-. Prodorsal shield design with dashed lines; dorsal opisthosomal annuli wavy-----*Calepitrimerus undatus* sp. nov.
15. Prodorsal shield design with median line; coverflap with transversal ridges in 2 rows at base ----------
---------*Calepitrimerus litseaus* sp. nov.
-. Prodorsal shield design median line absent; 1st dorsal annulus broad-------
Calepitrimerus heliciopsus -Chandrapatya, 2000
16. Prodorsal shield with the spatula process projecting to opisthosoma ----------
Glossilus yubimus (Huang, 1996) comb. nov.
-. Prodorsal shield without process projecting to opisthosoma---------- 17.
17. Prodorsal shield design without transverse line between admedian lines; coxal area with granules----------
-----*Epitrimerus lobatiae* Huang, 2001
-. Prodorsal shield design with transverse line between admedian lines; coxal area smooth----------
----------*Epitrimerus irisanus* sp. nov.
18. Scapular setae ahead of rear shield margin, directed forward, or up and centrally----------
-*Phyllocoptes multilinea* Huang, 2001
-. Scapular setae on rear shield margin, directed anteriorly or medioposteriorly---------- 19.
19. Prodorsal shield design with 2 transverse lines; admedian lines parallel; scapular tubercles large ----------
----------*Vasates irisanae* Huang, 1992
-. Prodorsal shield design with 4 transverse lines; admedian lines diverging to rear; scapular tubercles normal-----
---------- *Vasates digressio* sp. nov.

***Prominens* gen. nov.**

Type species: *Prominens taiwanensis* gen. et sp. nov.

Body spindle-shaped; shield lobe present, pentagonal, with a bulge between scapular tubercles, scapular tubercles set ahead of rear shield margin, setae directed upward and divergent; leg segments normal, hind genual setae absent, coxae with 3 pairs of tubercles and setae; empodium simple; opisthosoma arched, differentiated into broader dorsal annuli and narrower ventral annuli, anterodorsal opisthosoma with broad plate; ventral tubercles and setae normal; coverflap smooth.

Note: This new genus is close to *Proneotegonotus* Mohanasundaram, 1983, but differs in the shape of the shield and by the prodorsal shield bulge between the scapular tubercles.

Etymology: The genus name is feminine gender and refers to the shape of the pentagonal shield.

***Prominens taiwanensis* sp. nov.**

(Fig. 1)

Female: Body fusiform, 152 long, shield 47 long, 66 wide, shield lobe present, with several spines at anterior end, shield design lacking median line, admedian lines from base to 1/2, with transverse line at 1/2, submedian line from base to apical 1/5, converging to apex; scapular tubercles set ahead of rear

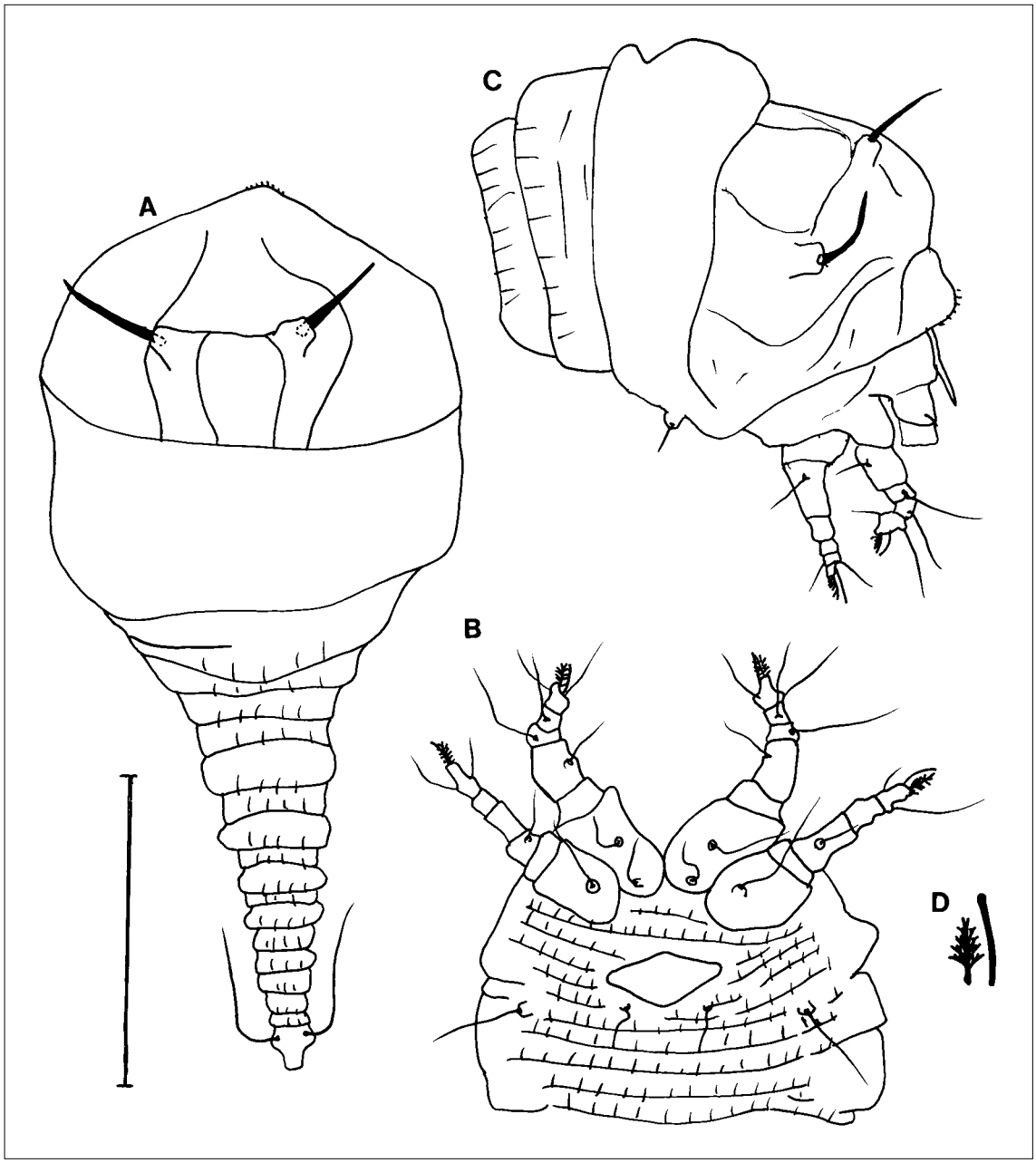

Fig. 1. *Prominens taiwanensis* gen. et sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

shield margin, setae (sc) 16 long, directed upward and diverging, Dt-Dt 24 apart, Dt-Sr 18; leg segments normal, tibial setae (1′) set in middle, 11 long, coxal area smooth, 1st coxal setae (1b) 5 long, Ct1-Ct1 16 apart, 2nd coxal setae (1a) 7 long, Ct2-Ct2 10 apart, 3rd coxal setae (2a) 15 long, Ct3-Ct3 25 apart, Ct1\Ct2

15, Ct1-Ct2 7, Ct2\Ct3 18, Ct2-Ct3 7; empodium simple, 5-rayed, claw ending in knob.

Opisthosoma: arched, differentiated into broader dorsal annuli and narrower ventral annuli, anterodorsal opisthosoma with broad plate, 1st dorsal annulus larger, separate from shield, posterior opisthosoma gradually tapering and narrowing, dorsal annuli with 16 spiny microtubercular rings, 1st 3 dorsal annuli 41 long; ventral annuli with 39 spiny microtubercular rings; lateral setae (c2) 11 long, Lt-Lt 46 apart, Lt\Vt1 42, Lt-Vt1 20; 1st ventral setae (d) 10 long, Vt1-Vt1 29 apart, Vt1\Vt2 26, Vt1-Vt2 20; 2nd ventral setae (e) 5 long, Vt2-Vt2 9 apart, Vt2\Vt3 51, Vt2-Vt3 50; 3rd ventral setae (f) 13 long, Vt3-Vt3 12 apart; accessory setae (h1) absent.

Coverflap: 17 wide, 6 long, rhombic shaped, smooth, genital setae (3a) 5 long, Gt-Gt 13 apart.

Male: Body 135 long, shield 35 long, 54 wide, scapular setae (sc) 15 long; genitalia 14 wide, 5 long, setae 5 long, Gt-Gt 9 apart.

Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Pasania harlandii* (Hance) Oerst (Fagaceae). (deposited at NMNS). **Paratypes**, 5♀2♂, data same as for holotype; 3♀1♂, ex *Castanopsis kanakamii* Hay. (Fagaceae); 2♀, 8 Sept. 1992, K. W. Huang and C. F. Wang; ex *Castanopsis kanakamii* Hay. (Fagaceae).

Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.

Note: This new species was found in association with *Pentaconvexus taiwanensis* Huang, 2001 on the same host plants.

***Setosecundus* gen. nov.**

Type species: *Setosecundus formosanus* gen. et sp. nov.

Body spindle-shaped; shield lobe present, scapular tubercles set near rear shield margin, setae directed posteriorly; leg segments and setae normal, coxae with 3 pairs of tubercles and setae, fore sternal line absent; empodium simple; opisthosoma with longitudinal furrow, annuli not differentiated into broader dorsal annuli and narrower ventral annuli; 2nd ventral tubercles and setae absent; coverflap with longitudinal ridges.

Note: This new genus is close to *Phyllocoptruta* Keifer, 1938, but differs by lacking 2nd ventral tubercles and setae, and the fore sternal line.

Etymology: Seta, meaning bristle; secundus, Latin, meaning second. The genus name is feminine gender and refers to the missing second ventral tubercles and setae.

***Setosecundus formosanus* sp. nov.**
(Fig. 2)

Female: Body spindle-shape, 162 long, shield 36 long, 53 wide, shield lobe present, shield design lacking median line, admedian lines from basal 1/7 to basal 6/7, semicircular, converging to apex, submedian line absent; scapular tubercles set near rear shield margin, setae (sc) 26 long, directed posteriorly, Dt-Dt 23 apart, Dt-Sr 6; leg segments normal, tibial setae (sc) 4 long, set at basal 1/3; coxal area smooth, fore sternal line absent, 1st coxal setae (1b) 5 long, Ct1-Ct1 9 apart, 2nd coxal setae (1a) 10 long, Ct2-Ct2 12 apart, 3rd coxal setae (2a) 23 long, Ct3-Ct3 24 apart, Ct1\Ct2 12, Ct1-Ct2 11, Ct2\Ct3 19, Ct2-Ct3 9; claw ending as knob; empodium simple, 4-rayed.

Opisthosoma: dorsum with median furrow, dorsal annuli with about 41 spiny microtubercular rings, 1st 3 dorsal annuli 9 long, ventral annuli with about 47 microtubercular rings; lateral setae (c2) 26 long, Lt-Lt 39 apart, Lt\Vt1 50, Lt-Vt1 26; 1st ventral setae (d) 28 long, Vt1-Vt1 36 apart; 3rd ventral setae (f) 18 long, Vt3-Vt3 17 apart; accessory setae

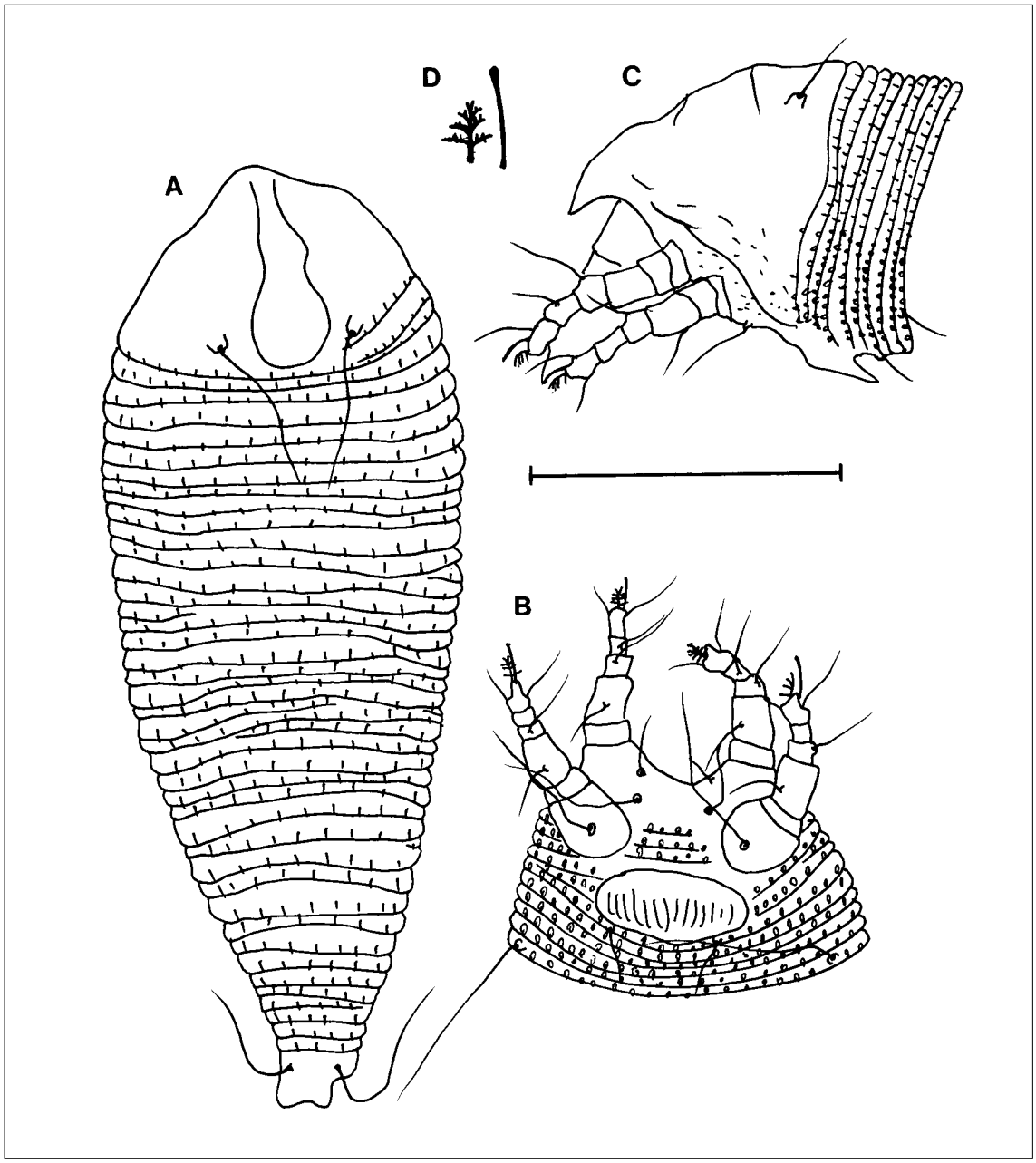

Fig. 2. *Setosecundus formosanus* gen. et sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

(h1) absent.

Coverflap: 24 wide, 12 long, with about 14 longitudinal ridges, genital setae (3a) 9 long, Gt-Gt 16 apart.

Male: Body 113 long, shield 32 long, 47 wide, scapular setae (sc) 14 long, Dt-Dt 23 apart; genitalia 15 wide, 5 long, setae 6 long, Gt-Gt 13 apart.

Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Styrax formosana* Matsum. var. *formosana* (Styracaceae). (deposited at NMNS). **Paratypes**, 5 ♀ 2 ♂, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.

***Phyllocoptruta dimidius* sp. nov.**
(Fig. 3)

Female: Body fusiform, 155 long, shield 34 long, 53 wide, shield lobe present, shield design with median line from base to basal 2/5, admedian lines complete, connected at base, with transverse lines at basal 2/5 and 1/2, directed towards submedian line, transverse line at 1/2 with forked line directed anteriorly, submedian line from scapular tubercles to anterolateral margin, with a forked line directed to anterior margin; scapular tubercles set ahead of rear shield margin, setae (sc) 4 long, directed centrally, Dt-Dt 15 apart, Dt-Sr 6; leg segments normal, tibial setae (sc) 5 long, set at 1/2; fore coxal area with granules, 1st coxal setae (1b) 6 long, Ct1-Ct1 10 apart, 2nd coxal setae (1a) 8 long, Ct2-Ct2 8 apart, 3rd coxal setae (2a) 17 long, Ct3-Ct3 21 apart, Ct1\Ct2 10, Ct1-Ct2 5, Ct2\Ct3 15, Ct2-Ct3 7; claw ending as knob; empodium simple, 6 rayed.
Opisthosoma: dorsum with median furrow, dorsal annuli with about 67 rings, with microtubercular at lateral ridges, 1st 3 dorsal annuli 3 long, ventral annuli with about 69 microtuberculate rings; lateral setae (c2) 27 long, Lt-Lt 41 apart, Lt\Vt1 45, Lt-Vt1 27; 1st ventral setae (d) 29 long, Vt1-Vt1 31 apart, Vt1\Vt2 40, Vt1-Vt2 32; 2nd ventral setae (e) 17 long, Vt2-Vt2 18 apart, Vt2\Vt3 41, Vt2-Vt3 37; 3rd ventral setae (f) 14 long, Vt3-Vt3 12 apart; accessory setae (h1) present.
Coverflap: 19 wide, 12 long, with about 8 longitudinal ridges and some transverse lines at base and sides laterally, genital setae (3a) 9 long, Gt-Gt 14 apart.
Male: Body 140 long, shield 32 long, 45 wide, scapular setae (sc) 5 long, Dt-Dt 12 apart; genitalia 12 wide, 4 long, setae 6 long, Gt-Gt 12 apart.
Type data: **Holotype** ♀, NANTOU: Renai Township, 9 Sept. 1992, K. W. Huang and C. F. Wang; ex *Sapium discolor* Muell. (Euphorbiaceae). (deposited at NMNS). **Paratypes**, 5 ♀ 2 ♂, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *P. musae* Keifer 1955 but differs in the shield design with transverse lines at the basal 2/5 and 1/2, the admedian lines are connected at the base, and the empodium is 6-rayed.
Etymology: This new name means "half" in reference to the shield design with median line in half.

***Phyllocoptruta peregi* sp. nov.**
(Fig. 4)

Female: Body fusiform, 164 long, shield 34 long, 54 wide, shield lobe present, shield design with median line from base to basal 3/4, admedian lines complete, diverging posterolaterad, with 3 transverse lines at basal 1/4, 1/2 and 3/4, transversae lines at 1/2 and basal 3/4 extending to lateral margin, with 3 longitudinal lines at each side, forming 2 cells between these 2 transverse lines, transverse line at basal 3/4 with 3 longitudinal lines directed anteriorly at each side, submedian line from scapular tubercles to 1/2, connected to transverse line at 1/2; scapular tubercles set ahead of rear shield margin, setae (sc) 9 long, directed upward, Dt-Dt 23 apart, Dt-Sr 5; leg segments normal, tibial setae (sc) 3 long, set at 1/2; coxal area with granules, 1st coxal setae (1b) 7 long, Ct1-Ct1 10 apart, 2nd coxal setae (1a) 8 long, Ct2-

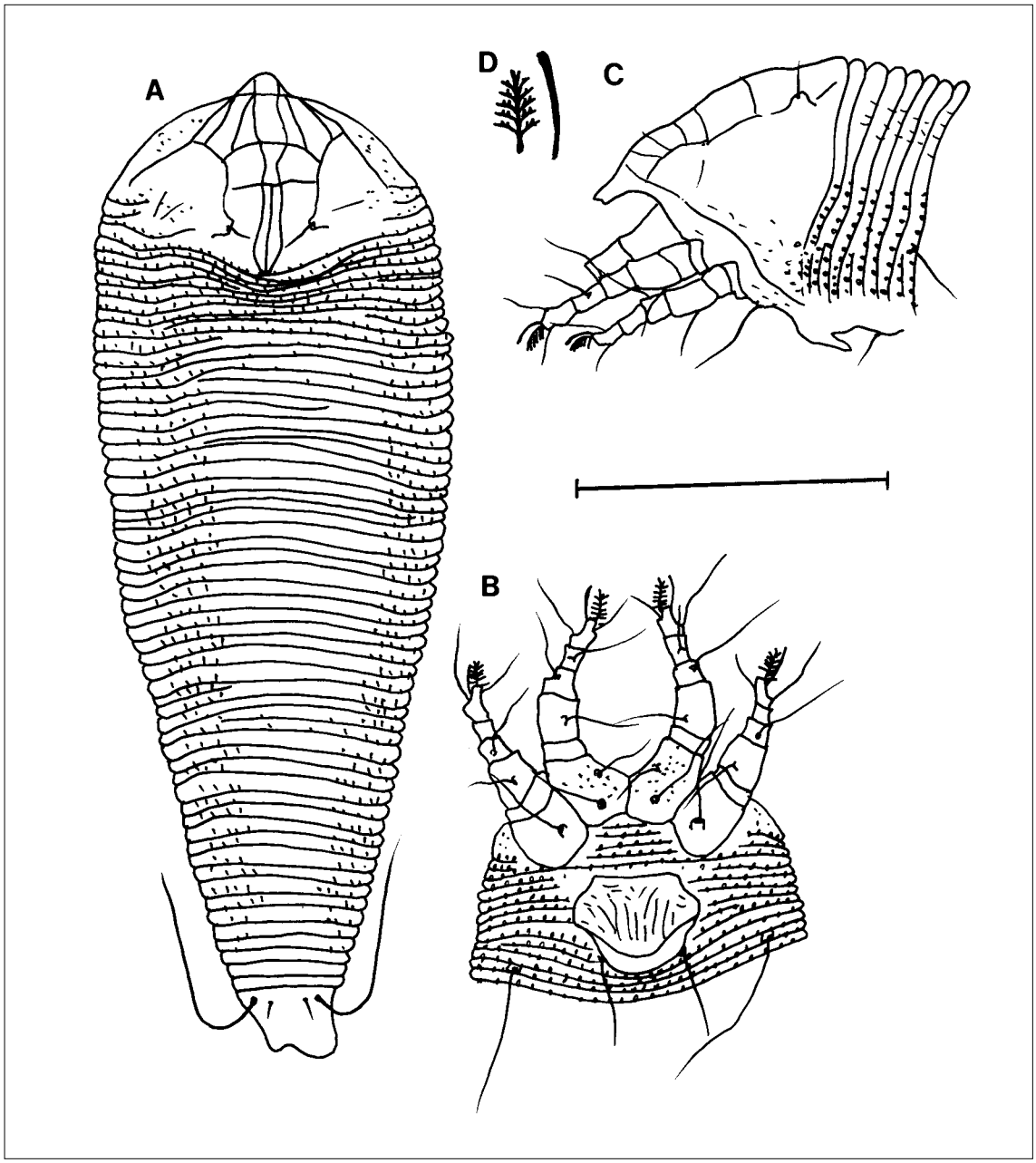

Fig. 3. *Phyllocoptruta dimidius* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

Ct2 10 apart, 3rd coxal setae (2a) 15 long, Ct3-Ct3 21 apart, Ct1\Ct2 11, Ct1-Ct2 5, Ct2\Ct3 17, Ct2-Ct3 8; claw ending as knob; empodium simple, 5-rayed.

Opisthosoma: dorsum with median furrow, dorsal annuli with about 53 rings, 1st 3 dorsal annuli 10 long, ventral annuli with about 66 microtuberculate

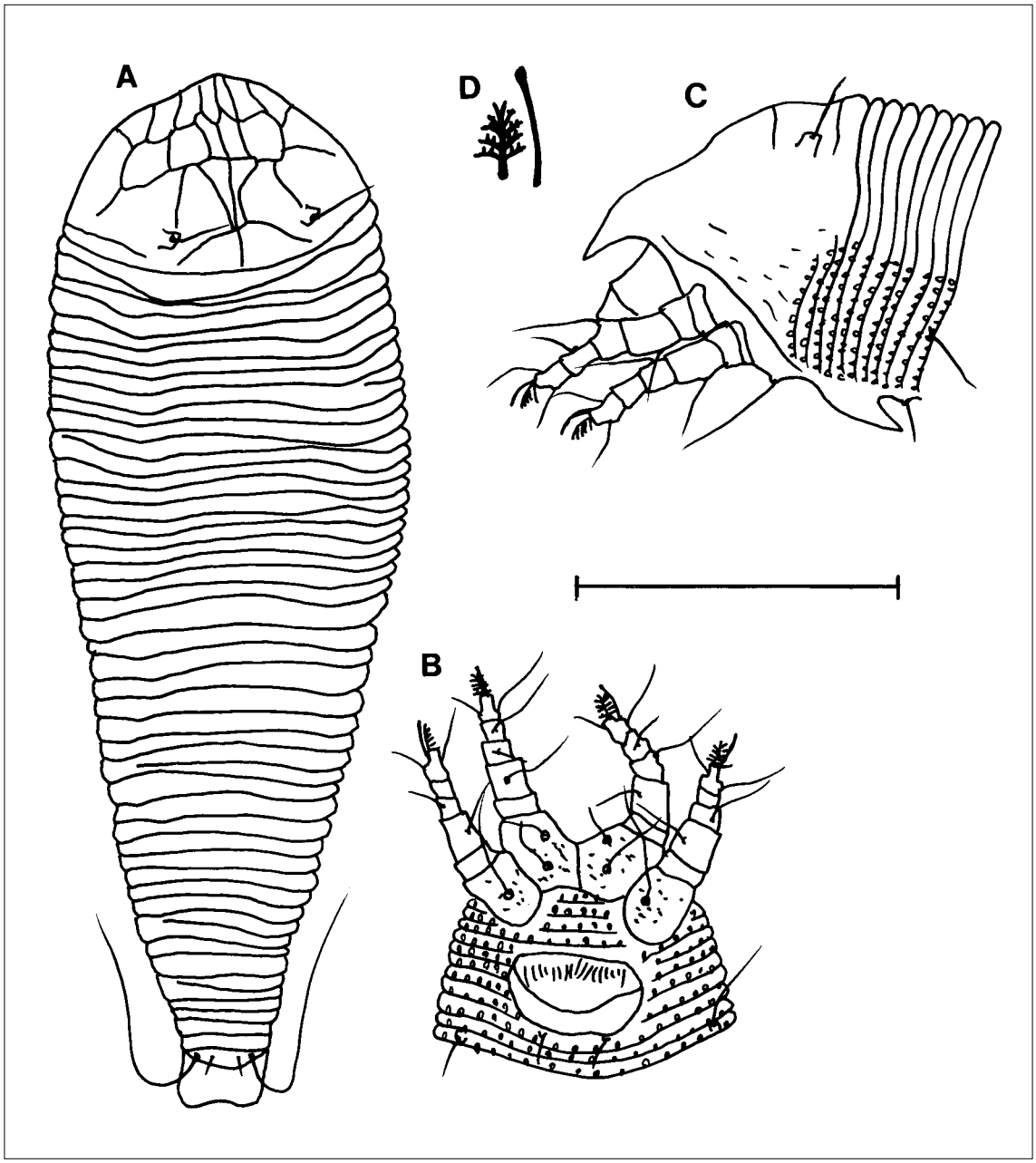

Fig. 4. *Phyllocoptruta peregi* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

rings; lateral setae (c2) 6 long, Lt-Lt 42 apart, Lt\Vt1 47, Lt-Vt1 27; 1st ventral setae (d) 36 long, Vt1-Vt1 34 apart, Vt1\Vt2 38, Vt1-Vt2 27; 2nd ventral setae (e) 7 long, Vt2-Vt2 21 apart, Vt2\Vt3 53, Vt2-Vt3 50; 3rd ventral setae (f) 11 long, Vt3-Vt3 15 apart; accessory setae (h1) present.

Coverflap: 23 wide, 12 long, with about 16 short longitudinal ridges at base, genital setae (3a) 5 long, Gt-Gt 11 apart.
Male: not seen.
Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Pasania konishii* (Hay.) Schottky (Fagaceae). (deposited at NMNS). **Paratypes**, 3♀, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *P. paracitri* Hong & Kuang, 1989 but differs in the shield design with 3 transverse lines at basal 1/3, 1/2 and basal 3/4, the admedian line diverging posterolaterad and empodium 5-rayed.
Etymology: This new name means "complete" in reference to the shield design with a complete admedian line.

***Phyllocoptruta semialatae* Huang, 1992**

Phyllocoptruta semialatae Huang, 1992

Specimens examined: 4♀3♂, NANTOU: Renai Township, 2 Nov. 1990, K. W. Huang; ex. *Rhus semialata* Murr. var. *roxburghiana* DC.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Distribution: Taiwan.

***Glossilus yubimus* (Huang, 1996) comb. nov.**

Epitrimerus yubimus Huang, 1996
Spatha yubima Huang, 2001

Specimens examined: 5♀2♂, NANTOU: Renai Township, 4 Oct. 1994, C. F. Wang; ex. *Cunninghamia lanceolata* (Lamb.) Hook. var. *lanceolata* form *lanceolata*
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Distribution: Taiwan.

***Cupacarus hebes* Huang, 2001**

Cupacarus hebes Huang, 2001

Specimens examined: 3♀, NANTOU: Renai Township, 4 Oct. 1994, C. F. Wang; ex. *Cunninghamia lanceolata* (Lamb.) Hook. var. *lanceolata* form. *lanceolata*
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This species was found in association with *Glossilus yubimus* Huang, 2001 on the same host plants.
Distribution: Taiwan.

***Phyllocoptes multilinea* Huang, 2001**

Phyllocoptes multilinea Huang, 2001

Specimens examined: 4♀, NANTOU: Renai Township, 4 Oct. 1994, C. F. Wang; ex. *Pueraria lobata* (Willd.) Ohwi var. *lobata*.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Distribution: Taiwan.

***Neoleipothrix superbae* sp. nov.**
(Fig. 5)

Female: Body spindle-shaped, 160 long, shield 50 long, 62 wide, shield lobe present, shield design smooth; scapular tubercles set ahead of rear shield margin, setae (sc) 4 long, directed centrally and upward, Dt-Dt 16 apart Dt-Sr 17; leg segments normal, fore, hind femur, and tibial setae lacking; coxal area smooth; 1st coxal setae (1b) 7 long, Ct1-Ct1 16 apart, 2nd coxal setae (1a) 8 long, Ct2-Ct2 8 apart, 3rd coxal setae (2a) 18 long, Ct3-Ct3 25 apart, Ct1\Ct2 14, Ct1-Ct2 10, Ct2\Ct3 16, Ct2-Ct3 8; claw ending as knob; empodium simple, 3-rayed.
Opisthosoma: dorsum with median and

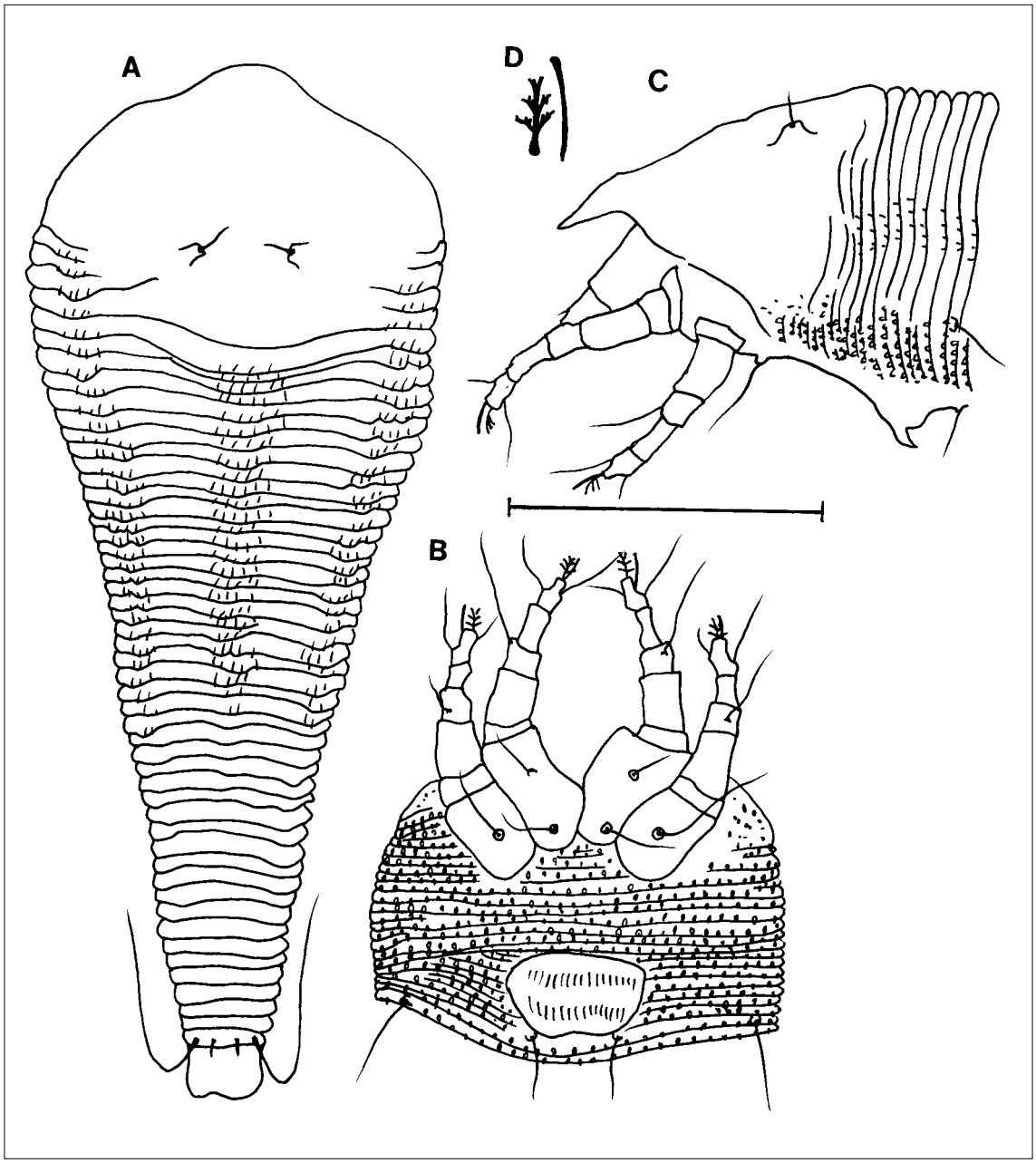

Fig. 5. *Neoleipothrix superbae* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

submedian ridges, dorsal annuli with about 53 rings, with spiny microtubercular at median and submedian ridge, 1st 3 dorsal annuli 8 long, ventral annuli with about 66 microtuberculate rings; lateral setae (c2) 14 long, Lt-Lt 53 apart, Lt\Vt1 49, Lt-Vt1 27, 1st ventral setae (d) 20 long, Vt1-Vt1 31 apart, Vt1\Vt2 36,

Vt1-Vt2 32; 2nd ventral setae (e) 9 long, Vt2-Vt2 11 apart, Vt2\Vt3 41, Vt2-Vt3 37; 3rd ventral setae (f) 20 long, Vt3-Vt3 19 apart; accessory setae (h1) present.
Coverflap: 22 wide, 15 long, with about 18 short longitudinal ridges in 2 rows, genital setae (3a) 15 long, Gt-Gt 14 apart.
Male: not seen.
Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Schima superba* Gard. et Champ. var. *superba* (Thaceae). (deposited at NMNS). **Paratypes**, 2 ♀ , data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *N. bambusae* Huang, 2001 but differs in the lack of fore tibia setae and by the 3 rayed empodium.

***Neoleipothrix leptae* sp. nov.**
(Fig. 6)

Female: Body spindle-shaped, 179 long, shield 53 long, 74 wide, shield lobe present, shield design without median line, admedian lines complete, parallel, submedian lines absent; scapular tubercles set on admedian lines, ahead of rear shield margin, setae (sc) 6 long, directed centrally and upward, Dt-Dt 17 apart, Dt-Sr 11; leg segments normal, fore and hind femur, and tibial setae absent; coxal area smooth; 1st coxal setae (1b) 16 long, Ct1-Ct1 21 apart, 2nd coxal setae (1a) 20 long, Ct2-Ct2 8 apart, 3rd coxal setae (2a) 29 long, Ct3-Ct3 31 apart, Ct1\Ct2 18, Ct1-Ct2 12, Ct2\Ct3 19, Ct2-Ct3 11; claw ending as knob; empodium simple, 4-rayed.
Opisthosoma: dorsum with median and submedian ridges, dorsal annuli with about 43 rings, 1st 3 dorsal annuli 11 long, ventral annuli with about 60 microtuberculate rings; lateral setae (c2) 21 long, Lt-Lt 65 apart, Lt\Vt1 54, Lt-Vt1 35, 1st ventral setae (d) 17 long, Vt1-Vt1 26 apart, Vt1\Vt2 42, Vt1-Vt2 35; 2nd ventral setae (e) 15 long, Vt2-Vt2 17 apart, Vt2\Vt3 44, Vt2-Vt3 37; 3rd ventral setae (f) 28 long, Vt3-Vt3 33 apart; accessory setae (h1) present.
Coverflap: 22 wide, 16 long, smooth, genital setae (3a) 13 long, Gt-Gt 19 apart.
Male: not seen.
Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Evodia lepta* (Spreng.) Merr. (Rutaceae). (deposited at NMNS). **Paratypes**, 2 ♀ , data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *N. multiflorus* Huang, 2001 but differs in the lack of fore tibia setae, by the shield design with parallel admedian lines, and the 4-rayed empodium.

***Neoleipothrix virgatus* sp. nov.**
(Fig. 7)

Female: Body spindle-shaped, 200 long, shield 50 long, 65 wide, shield lobe present, shield design with granules at lateral sides, without median line, admedian lines complete, sinuous, subparallel, submedian lines from basal 1/5 to 1/2; scapular tubercles set on admedian lines, ahead of rear shield margin, setae (sc) 5 long, directed centrally and upward, Dt-Dt 17 apart Dt-Sr 10; leg segments normal, fore and hind femur setae absent, fore tibia seta set at basal 1/4, 4 long; fore coxal area with longitudinal ridges; 1st coxal setae (1b) 8 long, Ct1-Ct1 16 apart, 2nd coxal setae (1a) 11 long, Ct2-Ct2 9 apart, 3rd coxal setae (2a) 22 long, Ct3-Ct3 25 apart, Ct1\Ct2 15, Ct1-Ct2 8, Ct2\Ct3 17, Ct2-Ct3 8; claw ending as knob; empodium simple, 4-rayed.
Opisthosoma: dorsum with median and submedian ridges, dorsal annuli with

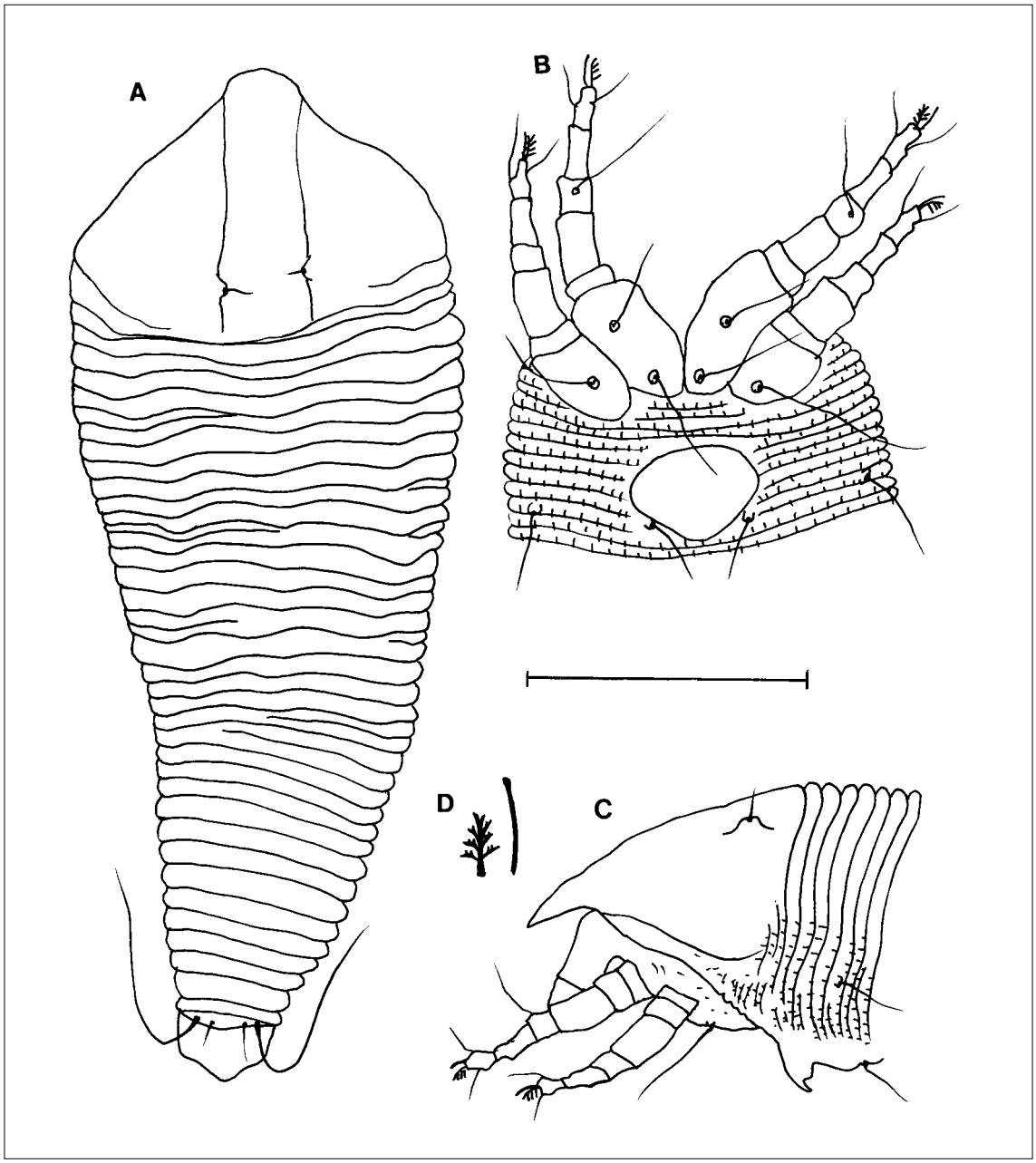

Fig. 6. *Neoleipothrix leptae* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

about 54 rings, 1st 3 dorsal annuli 5 long, ventral annuli with about 67 microtuberculate rings; lateral setae (c2) 16 long, Lt-Lt 52 apart, Lt\Vt1 54, Lt-Vt1 36, 1st ventral setae (d) 29 long, Vt1-Vt1 31 apart, Vt1\Vt2 46, Vt1-Vt2 40; 2nd ventral setae (e) 10 long, Vt2-Vt2 16 apart, Vt2\Vt3 52, Vt2-Vt3 49; 3rd ven-

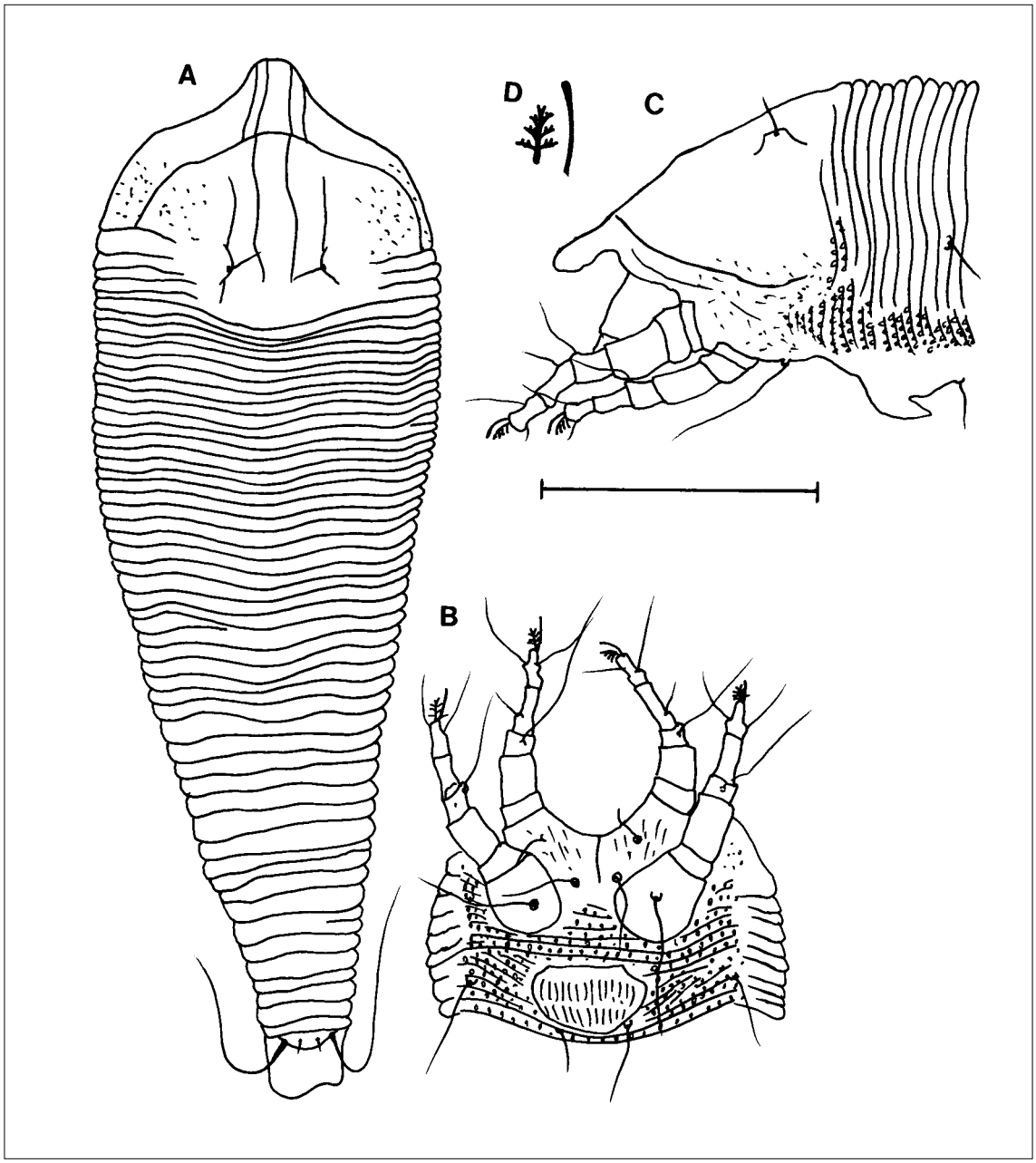

Fig. 7. *Neoleipothrix virgatus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

tral setae (f) 19 long, Vt3-Vt3 21 apart; accessory setae (h1) present.

Coverflap: 20 wide, 14 long, with about 16 short longitudinal ridges in 2 rows, genital setae (3a) 10 long, Gt-Gt 13 apart.

Male: Body 122 long, shield 41 long, 49 wide, scapular setae (sc) 5 long, Dt-Dt 15

apart; genitalia 13 wide, 5 long, setae 6 long, Gt-Gt 12 apart.
Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Styrax formosana* Matsum. var. *formosana* (Styracaceae). (deposited at NMNS). **Paratypes**, 4 ♀, 2 ♂, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *N. multiflorus* Huang, 2001 but differs in the shield design with submedian lines, coverflap with short longitudinal ridges in 2 rows, and the 4-rayed empodium.
Etymology: This new name means "stripe" in reference to the coverflap and fore coxal area with longitudinal ridges

***Monotrymacus ternatus* Huang, 2001**

Monotrymacus ternatus Huang, 2001

Specimens examined: 3 ♀, NANTOU: Renai Township, 4 Oct. 1994, C. F. Wang, 2♀, 8 Sep. 1992, K. W. Huang and C. F. Wang; ex. *Trupinia ternata* Nakai (Staphyleaceae).
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Distribution: Taiwan.

***Calepitrimerus octophyllaus* sp. nov.**
(Fig. 8)

Female: Body spindle-shaped, 155 long, shield 36 long, 51 wide, shield lobe present, shield design with granules, without median line, admedian lines, or submedian lines; scapular tubercles set ahead of rear shield margin, setae (sc) 19 long, directed outward and upward, Dt-Dt 21 apart, Dt-Sr 11; leg segments normal, tibial setae (1′) 5 long, set at basal 1/3; coxal area smooth; 1st coxal setae (1b) 7 long, Ct1-Ct1 9 apart, 2nd coxal setae (1a) 11 long, Ct2-Ct2 12 apart, 3rd coxal setae (2a) 24 long, Ct3-Ct3 21 apart, Ct1\Ct2 10, Ct1-Ct2 5, Ct2\Ct3 16, Ct2-Ct3 7; claw ending as knob; empodium simple, 6-rayed.
Opisthosoma: dorsum with median ridges ending before submedian ridges, dorsal annuli with about 29 rings, with spiny microtubercular on median ridge at anterior part, 1st 3 dorsal annuli 9 long, ventral annuli with about 63 microtuberculate rings; lateral setae (c2) 17 long, Lt-Lt 46 apart, Lt\Vt1 47, Lt-Vt1 31; 1st ventral setae (d) 31 long, Vt1-Vt1 33 apart, Vt1\Vt2 38, Vt1-Vt2 31; 2nd ventral setae (e) 9 long, Vt2-Vt2 15 apart, Vt2\Vt3 45, Vt2-Vt3 42; 3rd ventral setae (f) 21 long, Vt3-Vt3 19 apart; accessory setae (h1) present.
Coverflap: 19 wide, 11 long, with about 12 longitudinal ridges, cross ridges in 2 ranks at base, genital setae (3a) 7 long, Gt-Gt 13 apart.
Male: Body 133 long, shield 36 long, 51 wide, scapular setae (sc) 13 long, Dt-Dt 18 apart; genitalia 10 wide, 3 long, setae 6 long, Gt-Gt 10 apart.
Type data: **Holotype** ♀, NANTOU: Renai Township, 8 Sept. 1992, K. W. Huang and C. F. Wang; ex *Schefflera octophylla* (Lour.) Harms (Araliaceae). (deposited at NMNS). **Paratypes**, 5 ♀ 2 ♂, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *C. baileyi* Keifer 1938 but differs in the dorsal opisthosoma without a central carina, coverflap with cross ridges at the base, and the 6-rayed empodium.

***Calepitrimerus undatus* sp. nov.**
(Fig. 9)

Female: Body spindle-shaped, 187 long, shield 39 long, 61 wide, shield lobe present, shield design with granules at centrally, with 4 longitudinal lines at anterior; scapular tubercles set ahead of

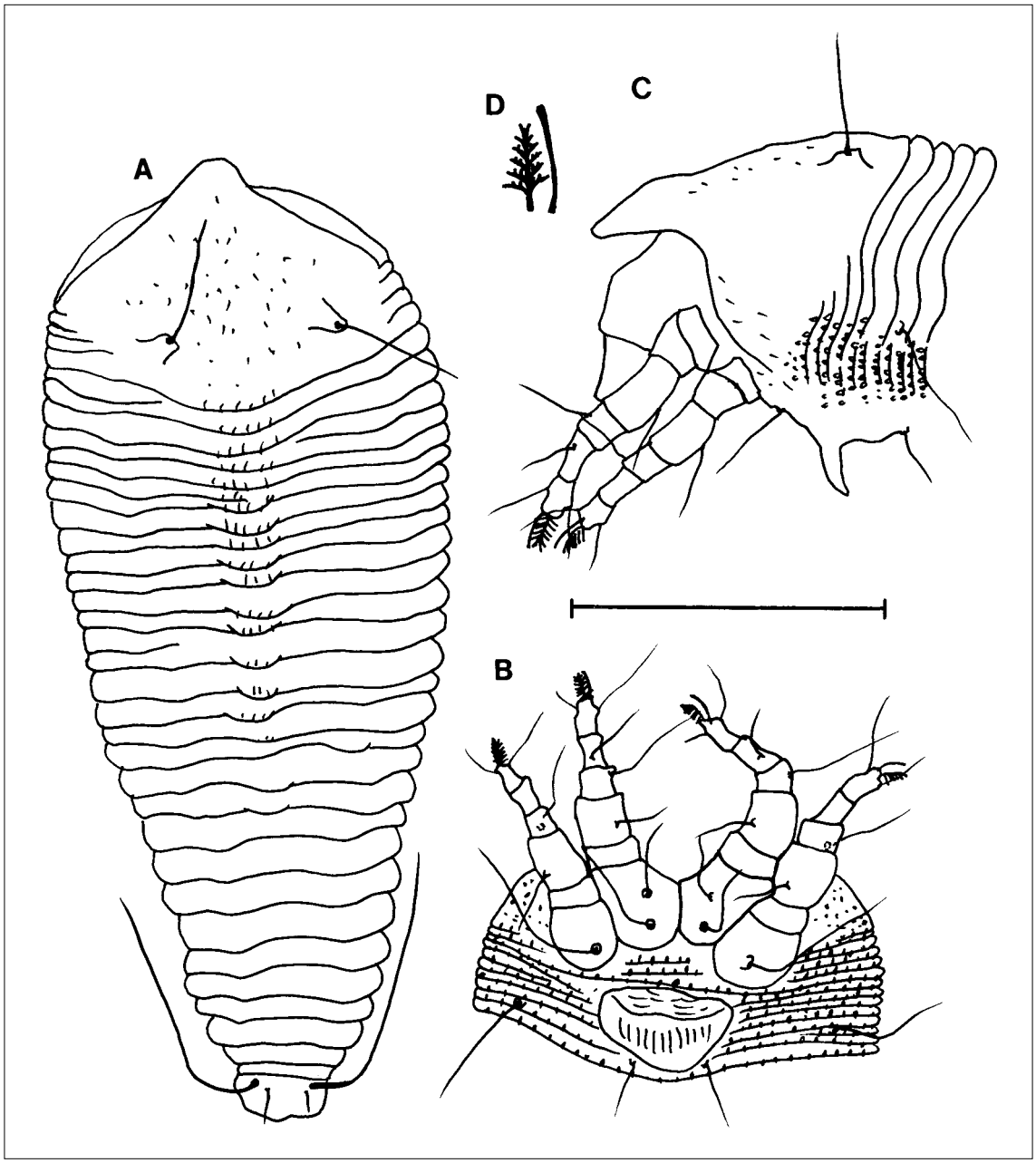

Fig. 8. *Calepitrimerus octophyllaus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

rear shield margin, setae (sc) 5 long, directed upward and centrally, Dt-Dt 19 apart, Dt-Sr 10; leg segments normal, tibial setae (1′) 8 long, set at 1/2; fore coxal area with longitudinal ridges; 1st coxal setae (1b) 7 long, Ct1-Ct1 14 apart, 2nd coxal setae (1a) 10 long, Ct2-Ct2 9 apart, 3rd coxal setae (2a) 24 long,

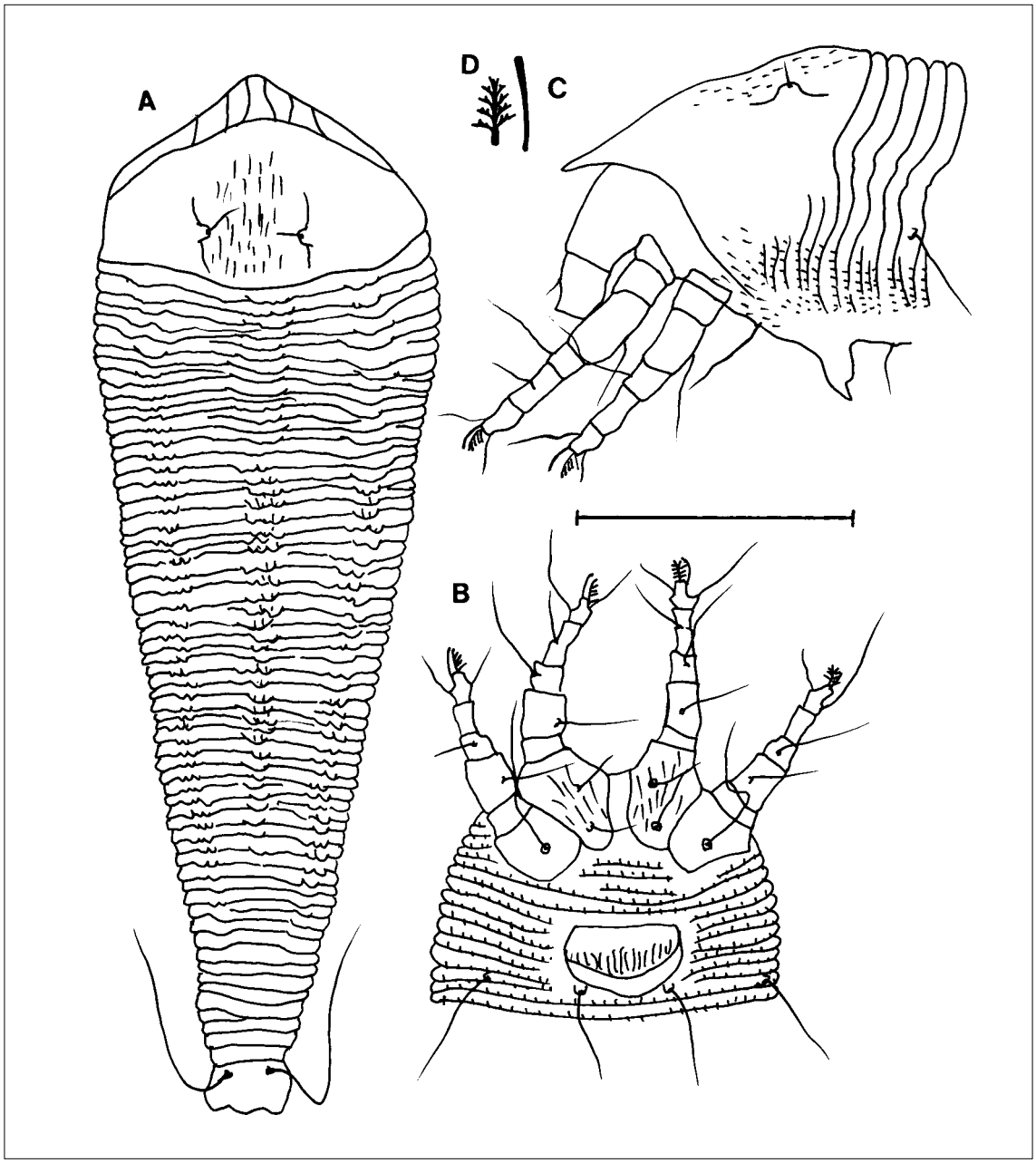

Fig. 9. *Calepitrimerus undatus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

Ct3-Ct3 27 apart, Ct1\Ct2 14, Ct1-Ct2 8, Ct2\Ct3 19, Ct2-Ct3 10; claw ending as knob; empodium simple, 5 rayed.

Opisthosoma: dorsum with median ridges ending before submedian ridges, dorsal annuli wavy, with about 79 rings, 1st 3 dorsal annuli 6 long, ventral annuli with about 88 microtuberculate rings;

lateral setae (c2) 28 long, Lt-Lt 46 apart, Lt\Vt1 51, Lt-Vt1 32; 1st ventral setae (d) 39 long, Vt1-Vt1 34 apart, Vt1\Vt2 48, Vt1-Vt2 43; 2nd ventral setae (e) 33 long, Vt2-Vt2 14 apart, Vt2\Vt3 53, Vt2-Vt3 50; 3rd ventral setae (f) 31 long, Vt3-Vt3 22 apart; accessory setae (h1) absent.
Coverflap: 23 wide, 14 long, with about 15 longitudinal ridges, genital setae (3a) 14 long, Gt-Gt 16 apart.
Male: Body 131 long, shield 37 long, 51 wide, scapular setae (sc) 5 long, Dt-Dt 15 apart; genitalia 15 wide, 5 long, setae 7 long, Gt-Gt 14 apart.
Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Stephania japonica* (Thunb.) Miers (Menispermaceae). (deposited at NMNS). **Paratypes**, 3 ♀ 2 ♂, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *C. sabinae* Kuang, 1991 but differs in the shield design with granules at centrally and the 5-rayed empodium.
Etymology: This new name means "wavy" in reference to the wavy dorsal annuli.

***Calepitrimerus heliciopsus* Chandrapatya & Boczek, 2000**
(Fig. 10)

Calepitrimerus heliciopsus Chandrapatya 2000
Female: Body spindle-shaped, 144 long, shield 51 long, 59 wide, shield lobe present, shield design with many short longitudinal lines, without median line, admedian lines complete, with transverse lines at basal 1/3 and 2/3, transverse lines at 2/3 Y-shaped, directed to sides, submedina lines semicircular, from base to basal 3/4, connected at base; scapular tubercles set on submedian lines, ahead of rear shield margin, setae (sc) 11 long, directed upward, Dt-Dt 16 apart, Dt-Sr 18; leg segments normal, tibial setae (1′) long, set at 1/2; fore coxal sternal line absent, coxal area smooth; 1st coxal setae (1b) 5 long, Ct1-Ct1 10 apart, 2nd coxal setae (1a) 11 long, Ct2-Ct2 10 apart, 3rd coxal setae (2a) 15 long, Ct3-Ct3 22 apart, Ct1\Ct2 12, Ct1-Ct2 6, Ct2\Ct3 16, Ct2-Ct3 7; claw ending as knob; empodium simple, 6-rayed.
Opisthosoma: dorsum with median ridges ending before submedian ridges, dorsal annuli with about 32 rings, 1st annulus broad and fused to posterior shield, with short longitudinal ridges, with spiny microtubercular on median and submedian ridges, 1st 3 dorsal annuli 13 long, ventral annuli with about 41 microtuberculate rings; lateral setae (c2) 17 long, Lt-Lt 37 apart, Lt\Vt1 34, Lt-Vt1 20; 1st ventral setae (d) 19 long, Vt1-Vt1 21 apart, Vt1\Vt2 32, Vt1-Vt2 28; 2nd ventral setae (e) 8 long, Vt2-Vt2 12 apart, Vt2\Vt3 40, Vt2-Vt3 38; 3rd ventral setae (f) 15 long, Vt3-Vt3 13 apart; accessory setae (h1) absent.
Coverflap: 19 wide, 10 long, with about 12 longitudinal ridges, genital setae (3a) 6 long, Gt-Gt 13 apart.
Male: not seen.
Specimens examined: 4 ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Helicia formosana* Hemsl. (Proteaceae). (deposited at NMNS).
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Distribution: Thailand, Taiwan (new record).

***Calepitrimerus litseaus* sp. nov.**
(Fig. 11)

Female: Body spindle-shaped, 126 long, shield 46 long, 50 wide, shield lobe present, shield design with complete median line and admedian lines, subparallel, connected at base, with transverse line at 1/2 and basal 3/4, directed to sides, 1st submedian lines from basal 1/4 to anterior, 2nd submedian lines from basal

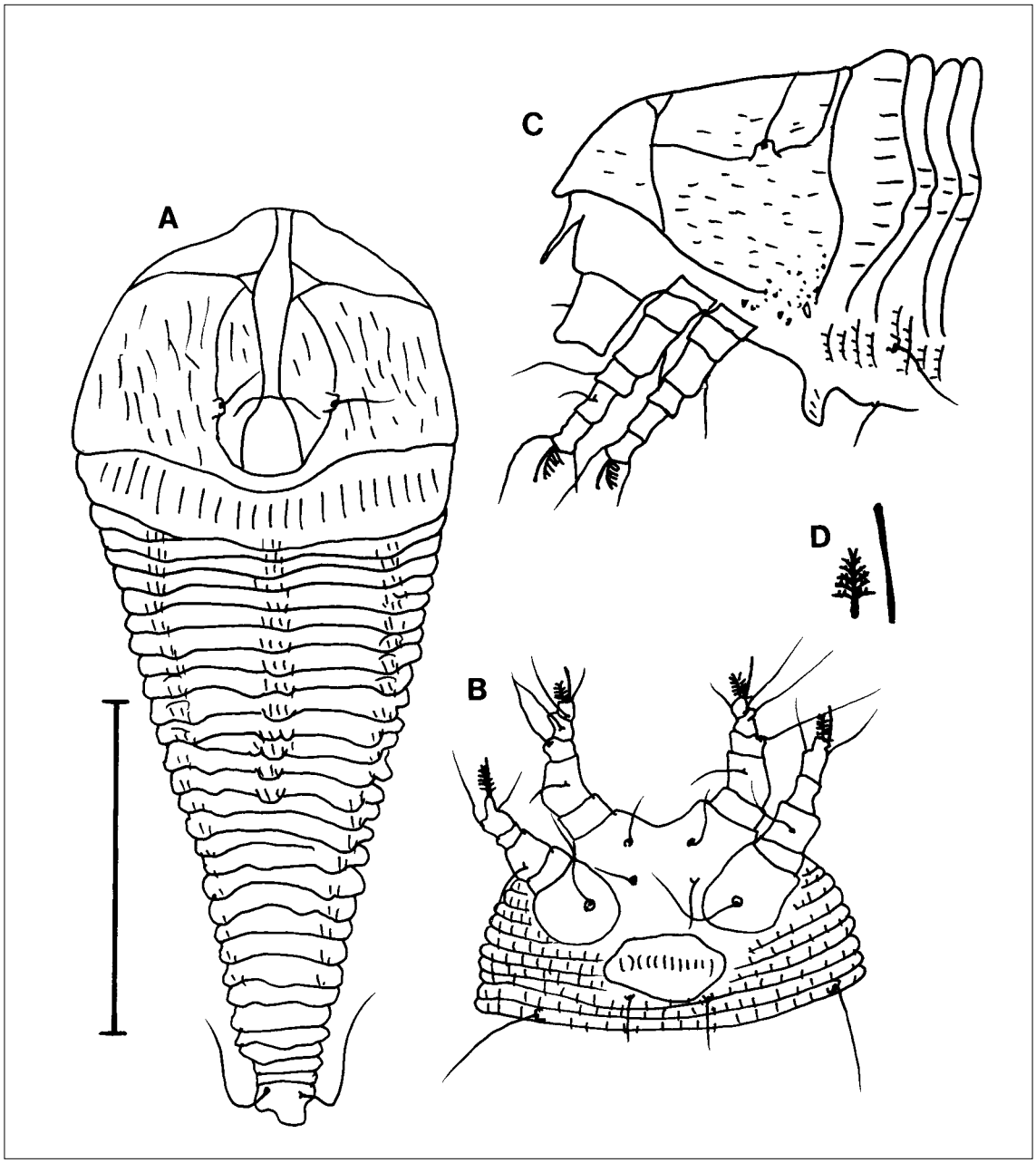

Fig. 10. *Calepitrimerus heliciopsus* Chandrapatya & Boczek, 2000 (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

1/3 to half, X-shape, connected to 1st submedian lines; scapular tubercles set ahead of rear shield margin, setae (sc) 4 long, directed upward and toward centrally, Dt-Dt 18 apart, Dt-Sr 9; leg segments normal, tibial setae (1′) 5 long, set at basal 1/3; coxal area with dashed lines; 1st coxal setae (1b) 6 long, Ct1-Ct1

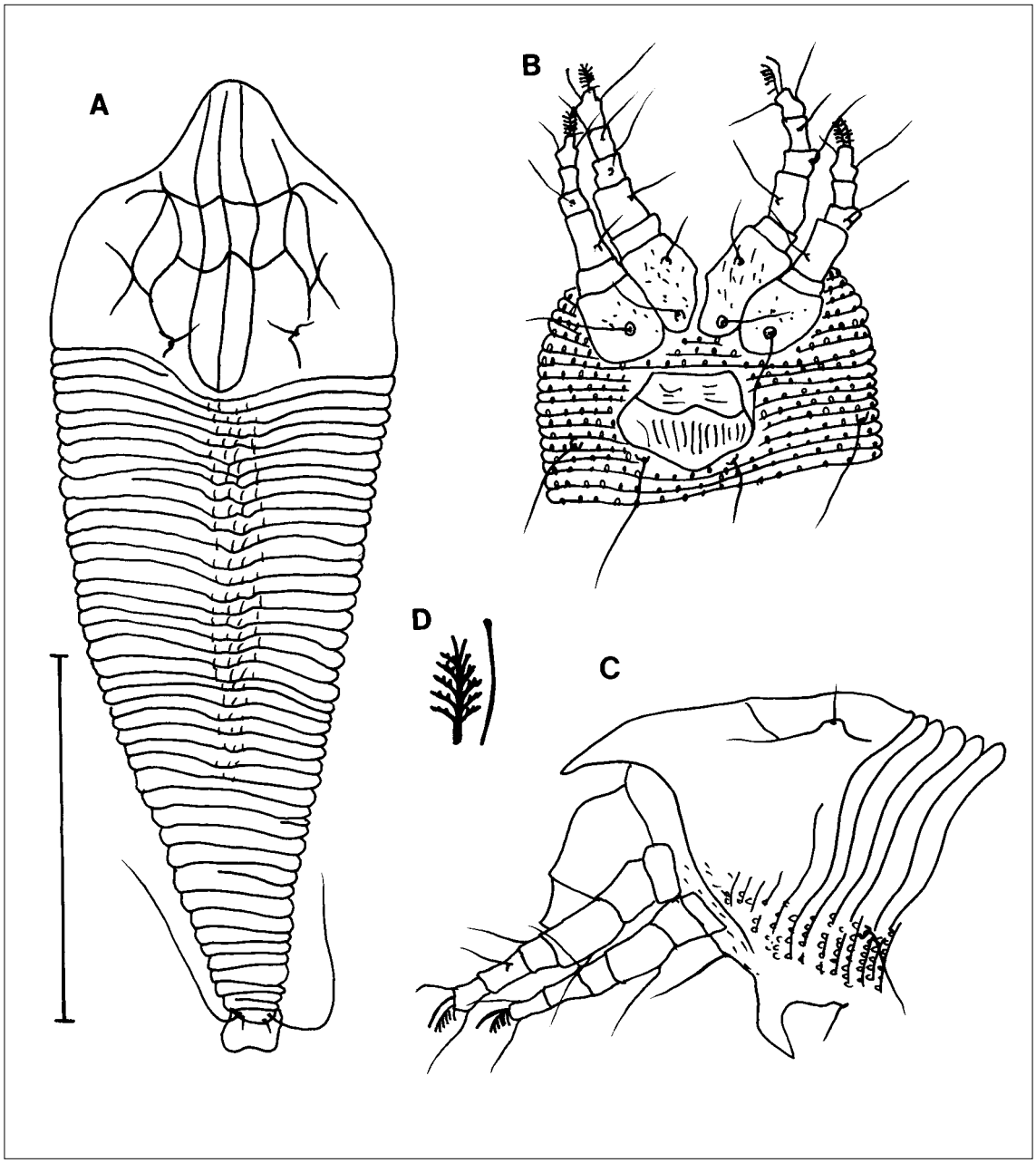

Fig. 11. *Calepitrimerus litseaus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

10 apart, 2nd coxal setae (1a) 10 long, Ct2-Ct2 6 apart, 3rd coxal setae (2a) 18 long, Ct3-Ct3 20 apart, Ct1\Ct2 12, Ct1-Ct2 9, Ct2\Ct3 14, Ct2-Ct3 7; claw ending as knob; empodium simple, 6-rayed.

Opisthosoma: dorsum with median ridges ending before submedian ridges, dorsal

annuli with about 45 rings, with spiny microtubercular on median ridge at anterior part, 1st 3 dorsal annuli 6 long, ventral annuli with about 61 microtuberculate rings; lateral setae (c2) 16 long, Lt-Lt 37 apart, Lt\Vt1 35, Lt-Vt1 21; 1st ventral setae (d) 24 long, Vt1-Vt1 20 apart, Vt1\Vt2 27, Vt1-Vt2 23; 2nd ventral setae (e) 35 long, Vt2-Vt2 9 apart, Vt2\Vt3 29, Vt2-Vt3 26; 3rd ventral setae (f) 17 long, Vt3-Vt3 15 apart; accessory setae (h1) present.
Coverflap: 18 wide, 13 long, with about 12 longitudinal ridges, cross ridges in 2 ranks at base, genital setae (3a) 18 long, Gt-Gt 12 apart.
Male: not seen.
Type data: **Holotype** ♀, NANTOU: Renai Township, 8 Sept. 1992, K. W. Huang and C. F. Wang; ex *Litsea kostermansii* Chang (Lauraceae). (deposited at NMNS). **Paratypes**, 2♀, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *C. reticulates* Huang, 2001 but differs in the shield design with a complete median line, admedian lines without a fork at the posterior, coxal area with dashed lines, and the 6-rayed empodium.

***Epitrimerus lobatiae* Huang, 2001.**

Epitrimerus lobatiae Huang, 2001.

Specimens examined: 2♀, NANTOU: Renai Township, 8 Sep. 1992, K. W. Huang and C. F. Wang and 6 Oct. 1994, C. F. Wang; ex. *Pueraria lobata* (Willd.) Ohwi (Leguminosae).
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Distribution: Taiwan.

***Epitrimerus irisanus* sp. nov.**
(Fig. 12)

Female: Body spindle-shaped, 195 long, shield 49 long, 66 wide, shield lobe present, shield design without median line, admedian lines complete, converging to apex, with 3 transverse lines at basal 1/6, 1/2 and 2/3, submedian lines absent; scapular tubercles set ahead of rear shield margin, setae (sc) 8 long, directed upward and centrally, Dt-Dt 20 apart, Dt-Sr 8; leg segments normal, tibial setae (1′) 2 long, set at basal 1/4; coxal area smooth, coxal sternal line absent; 1st coxal setae (1b) 5 long, Ct1-Ct1 10 apart, 2nd coxal setae (1a) 8 long, Ct2-Ct2 9 apart, 3rd coxal setae (2a) 16 long, Ct3-Ct3 25 apart, Ct1\Ct2 11, Ct1-Ct2 6, Ct2\Ct3 17, Ct2-Ct3 9; claw ending as knob; empodium simple, 4-rayed.
Opisthosoma: dorsum with median ridges fading with submedian ridges, dorsal annuli with about 32 rings, with microtubercular at median ridges, 1st 3 dorsal annuli 13 long, ventral annuli with about 52 microtuberculate rings; lateral setae (c2) 14 long, Lt-Lt 53 apart, Lt\Vt1 54, Lt-Vt1 33; 1st ventral setae (d) 29 long, Vt1-Vt1 35 apart, Vt1\Vt2 36, Vt1-Vt2 29; 2nd ventral setae (e) 7 long, Vt2-Vt2 15 apart, Vt2\Vt3 48, Vt2-Vt3 46; 3rd ventral setae (f) 16 long, Vt3-Vt3 18 apart; accessory setae (h1) present.
Coverflap: 22 wide, 12 long, with about 17 longitudinal ridges, genital setae (3a) 8 long, Gt-Gt 18 apart.
Male: Body 132 long, shield 40 long, 46 wide, scapular setae (sc) 6 long, Dt-Dt 15 apart; genitalia 13 wide, 5 long, setae 9 long, Gt-Gt 12 apart.
Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Ficus irisana* Elm. (Moraceae). (deposited at NMNS). **Paratypes**, 2♀, 1♂, data same as for holotype.
Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.
Note: This new species is close to *E. turgidus* Huang, 2001 but differs in the shield design with 3 transverse lines

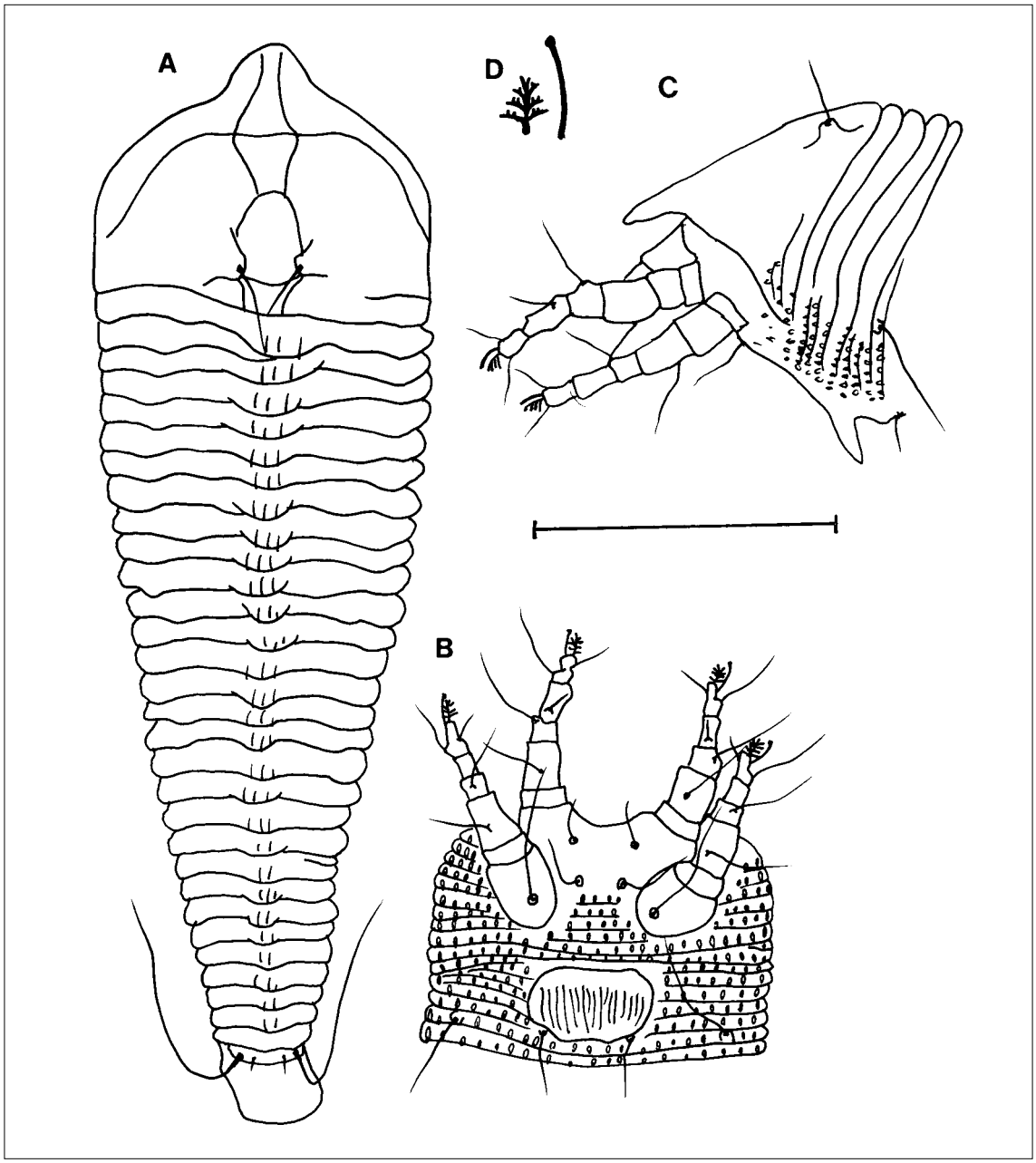

Fig. 12. *Epitrimerus irisanus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

between the admedian lines, and the coverflap with longitudinal ridges.

***Vasates irisanae* Huang, 1992**

(Fig. 13)

Vasates irisanae Huang, 1992

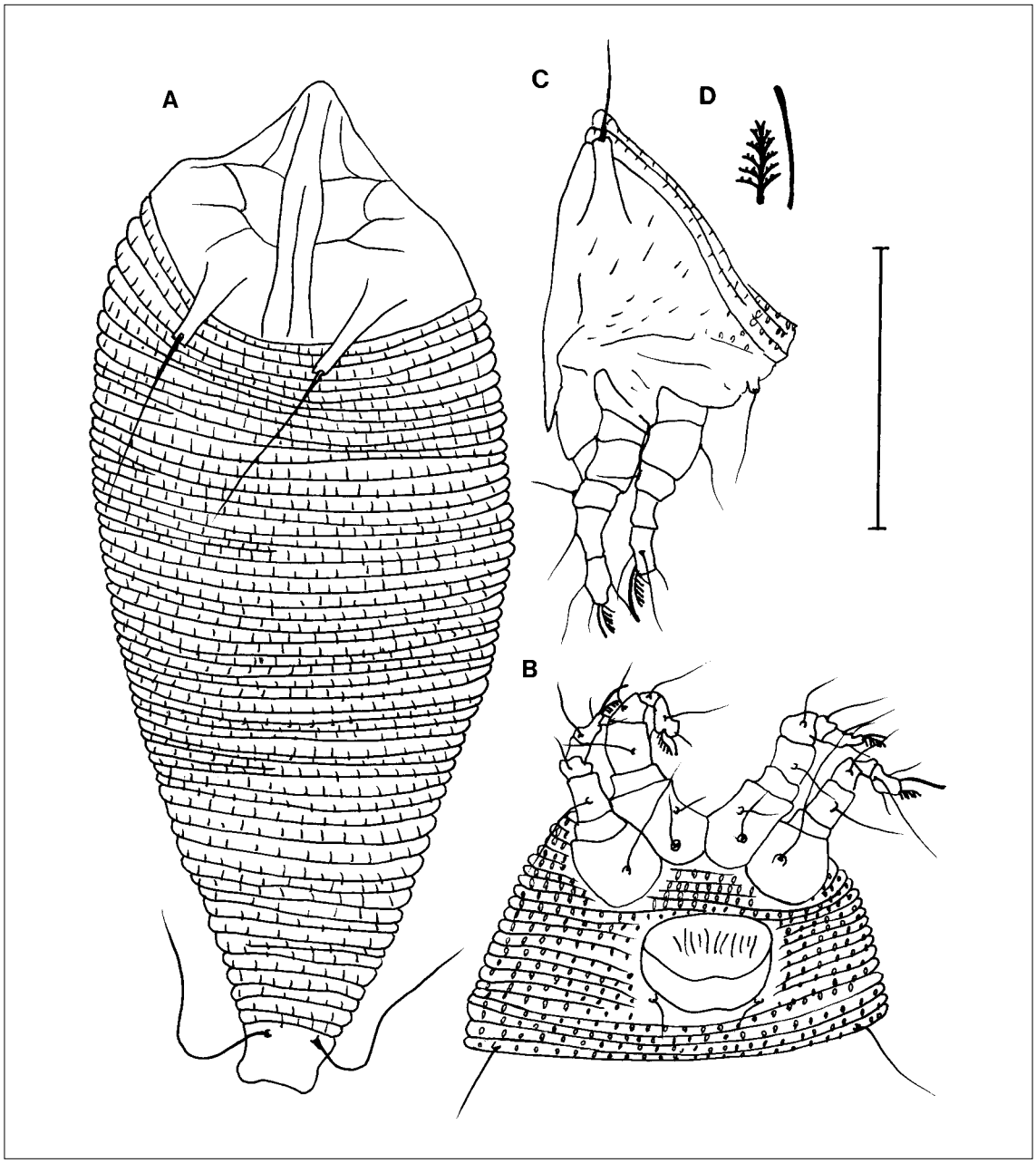

Fig. 13. *Vasates irisanae* Huang, 1992 (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

Female: Body spindle-shaped, 231 long, shield 55 long, 75 wide, shield lobe present, shield design with median line from base to basal 2/3, admedian lines complete, subparallel with median line, with transverse line at 1/2 and basal 2/3, diverging to sides, transverse line at 1/2 with forked lines at half and apex, the

transverse line at basal 2/3 with forked line at 1/2, directed to anterior margin, submedian line absent; scapular tubercles large, set ahead of rear shield margin, setae (sc) 41 long, directed upward and to rear, Dt-Dt 36 apart, Dt-Sr 14; leg segments normal, fore tibial setae 16 long, set at 1/2; coxal area smooth; 1st coxal setae (1b) 5 long, Ct1-Ct1 13 apart, 2nd coxal setae (1a) 12 long, Ct2-Ct2 13 apart, 3rd coxal setae (2a) 30 long, Ct3-Ct3 30 apart, Ct1\Ct2 15, Ct1-Ct2 7, Ct2\Ct3 22, Ct2-Ct3 10; claw ending as knob; empodium simple, 6-rayed.

Opisthosoma: arched, dorsal annuli with about 47 spiny microtuberculate rings, 1st 3 dorsal annuli 12 long, ventral annuli with about 65 microtuberculate rings; lateral setae (c2) 16 long, Lt-Lt 66 apart, Lt\Vt1 66, Lt-Vt1 33; 1st ventral setae (d) 36 long, Vt1-Vt1 51 apart, Vt1\Vt2 54, Vt1-Vt2 38; 2nd ventral setae (e) 11 long, Vt2-Vt2 28 apart, Vt2\Vt3 68, Vt2-Vt3 62; 3rd ventral setae (f) 25 long, Vt3-Vt3 28 apart; accessory setae (h1) absent.

Coverflap: 28 wide, 19 long, with about 10 longitudinal ridges, genital setae (3a) 9 long, Gt-Gt 21 apart.

Male: not seen.

Specimens examined: 2♀, NANTOU: Renai Township, 8 Sep. 1992, K. W. Huang and C. F. Wang and 3♀, 6 Oct. 1994, C. F. Wang; ex. *Ficus irisana* Elm. (Moraceae); 2♀, NANTOU: Renai Township, 8 Sep. 1992, K. W. Huang and C. F. Wang; ex. *Polygonum chinense* L. (Polygonaceae).

Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.

Distribution: Taiwan.

***Vasates digressio* sp. nov.**
(Fig. 14)

Female: Body spindle-shaped, 157 long, shield 37 long, 59 wide, shield lobe present, shield design with reticulations, median line from basal 3/10 to 9/10, admedian lines from base to basal 9/10, diverging to rear, with 4 transverse lines at basal 3/10, 6/10, 7/10, and 9/10, with a tier of 10 cells along anterolateral shield margin, 10 cells in middle, and 2 cells on rear of shield, submedian line absent; scapular tubercles set ahead of rear shield margin, setae (sc) 11 long, directed upward and to rear, Dt-Dt 22 apart, Dt-Sr 9; leg segments normal, fore tibial setae 7 long, set at 1/2; fore coxal area with granules; 1st coxal setae (1b) 5 long, Ct1-Ct1 9 apart, 2nd coxal setae (1a) 11 long, Ct2-Ct2 8 apart, 3rd coxal setae (2a) 14 long, Ct3-Ct3 24 apart, Ct1\Ct2 10, Ct1-Ct2 6, Ct2\Ct3 16, Ct2-Ct3 8; claw ending as knob; empodium simple, 5-rayed.

Opisthosoma: arched, dorsal annuli with about 51 rings, 1st 3 dorsal annuli 6 long, ventral annuli with about 57 microtuberculate rings; lateral setae (c2) 6 long, Lt-Lt 42 apart, Lt\Vt1 45, Lt-Vt1 25; 1st ventral setae (d) 55 long, Vt1-Vt1 33 apart, Vt1\Vt2 37, Vt1-Vt2 28; 2nd ventral setae (e) 4 long, Vt2-Vt2 17 apart, Vt2\Vt3 40, Vt2-Vt3 37; 3rd ventral setae (f) 15 long, Vt3-Vt3 15 apart; accessory setae (h1) absent.

Coverflap: 22 wide, 12 long, with about 8 longitudinal ridges, genital setae (3a) 6 long, Gt-Gt 12 apart.

Male: not seen.

Type data: **Holotype** ♀, NANTOU: Renai Township, 6 Oct. 1994, C. F. Wang; ex *Pasania harlandii* (Hance) Oerst (Fagaceae). (deposited at NMNS). **Paratypes**, 2 ♀, data same as for holotype.

Relation to host: A vagrant on the lower leaf surface. No apparent damage was observed.

Note: This new species is close to *V. morindae* Chandrapatya, 1996 but differs in the shield design with 4 transverse lines between the admedian lines, median line from the basal 3/10 to 9/10, and a tier of 10 cells along the anterolateral shield margin, 10 cells in the middle, 2

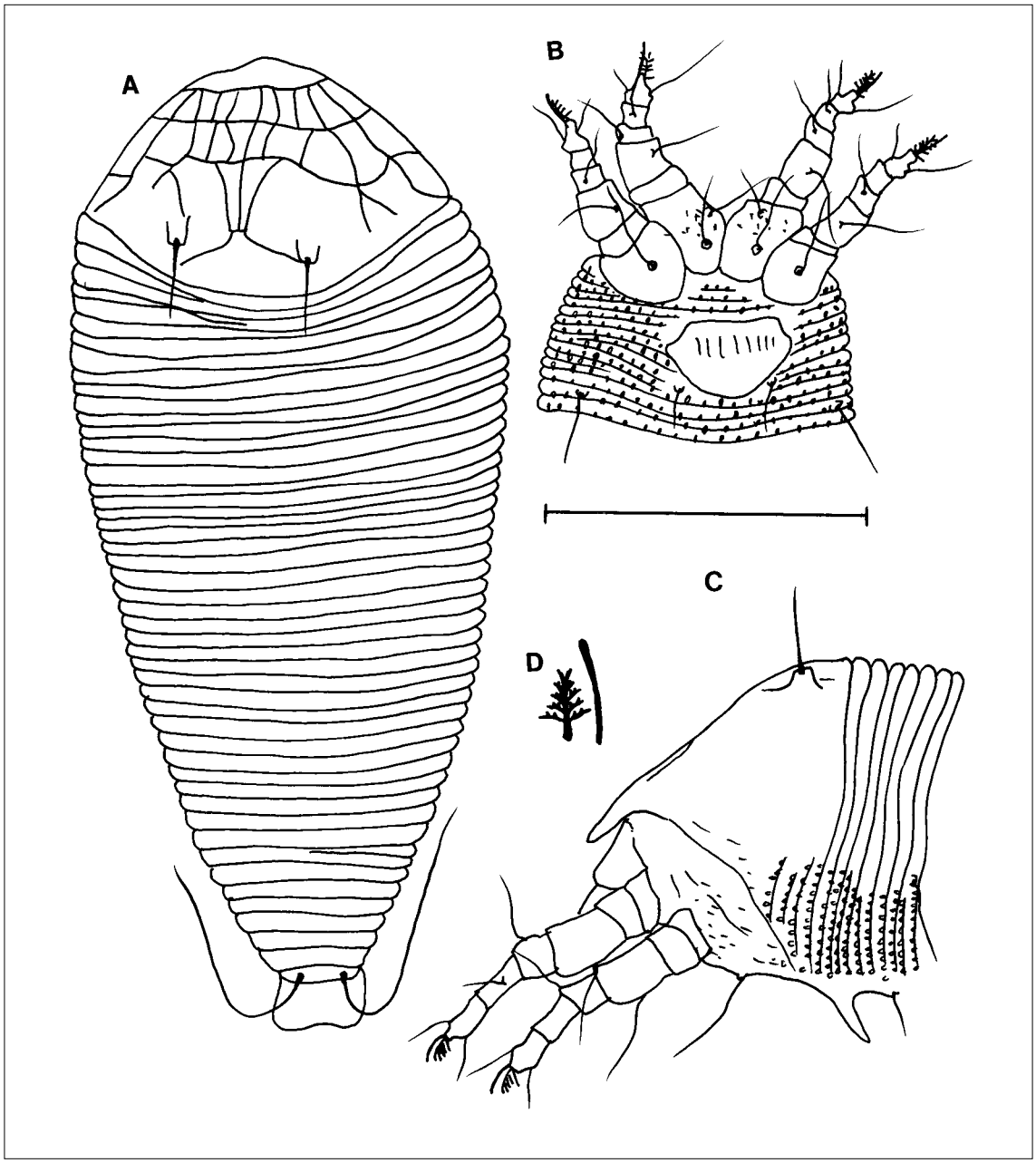

Fig. 14. *Vasates digressio* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area, lateral view; D, empodium. (scale A, B = 50 μm; C = 40 μm; D = 15 μm)

cells on the rear of the shield. This new species was found in association with *Prominens taiwanensis* sp. nov. on the same host plants.

Etymology: This new name means "divergence" in reference to the admedian line which diverges to the rear.

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臺灣產節蜱：描述二十種惠蓀林場葉刺節蜱族 (蠕蜱亞綱：節蜱總科：葉刺節蜱亞科)

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摘　要

本文描述及繪圖 11 屬、20 種惠蓀林場葉刺節蜱族，其中包含 2 新屬、12 新種及 8 舊有種。分別爲：*Prominens taiwanensis* gen. et sp. nov. 爲害短尾葉石櫟 (*Pasania harlandii*), *Setosecundus formosanus* gen. et sp. nov. 爲害烏皮九芎 (*Styrax formosana*), *Phyllocoptruta peregi* sp. nov. 爲害小西氏石櫟 (*Pasania konishii*), *Phyllocoptruta dimidius* sp. nov. 爲害白臼 (*Sapium discolor*), *Phyllocoptruta semialatae* Huang, 1992 爲害羅氏鹽膚木 (*Rhus semialata* var. *roxburghiana*), *Cupacarus hebes* Huang, 2001 爲害福州杉 (*Cunninghamia lanceolata*), *Neoleipothrix superbae* sp. nov. 爲害木荷 (*Schima superba* var. *superba*). *Neoleipothrix leptae* sp. nov. 爲害三叉虎(*Evodia lepta*), *Neoleipothrix virgatus* sp. nov. 爲害烏皮九芎(*Styrax formosana*), *Calepitrimerus octophyllaus* sp. nov. 爲害江某(*Scheffera octophylla*), *Calepitrimerus undatus* sp. nov. 爲害千金藤 (*Stephania japonica*), *Calepitrimerus litseaus* sp. nov. 爲害小梗黃肉楠 (*Litsea kostermansii*), *Calepitrimerus heliciopsus* Chandrapatya & Boczek, 2000 爲害山龍眼 (*Helicia formosana*), *Glossilus yubimus* (Huang, 1996) 爲害福州杉 (*Cunninghamia lanceolata*), *Epitrimerus lobatiae* Huang, 2001 爲害葛藤 (*Pueraria montana*), *Epitrimerus irisanus* sp. nov. 爲害澀葉榕 (*Ficus irisana*), *Vasates irisanae* Huang, 1992 爲害澀葉榕 (*Ficus irisana*) 及火炭母草 (*Polygonum chinease*), *Vasates digressio* sp. nov. 爲害短尾葉石櫟(*Pasania harlandii*), *Monotrymacus ternatus* Huang, 2001 爲害臺灣山香圓(*Turpinia ternata*) 及 *Phyllocoptes multilinea* Huang, 2001 爲害葛藤(*Pueraria montana*)。本文並對惠蓀林場產葉刺節蜱族的種做一檢索表。

關鍵詞：葉刺節蜱族、新屬、惠蓀、臺灣