



# Formosan Entomologist

Journal Homepage: [entsocjournal.yabee.com.tw](http://entsocjournal.yabee.com.tw)

## Eriophyoid Mites of Hainan, China (Acari: Eriophyoidea) 【Research report】

### 中國海南省的節蟬（蟎蟬亞綱：節蟬總科）【研究報告】

Kun-Wei Huang\* Lisheng Cheng  
黃坤煒\* 程立生

\*通訊作者E-mail: [eri@mail.nmns.edu.tw](mailto:eri@mail.nmns.edu.tw)

Received: 2005/11/14 Accepted: 2005/12/28 Available online: 2005/12/01

#### Abstract

In this work, we describe and illustrate two families, seven subfamilies, 17 genera, and 20 species of Eriophyoidea, including 15 new species and five known species, from Hainan Island (South China): *Aberoptus integritas* sp. nov. (infesting *Sindora cochinchinensis*), *Apontella succedana* sp. nov. (infesting *Rhus succedanea*), *Anothopoda hainanensis* sp. nov. (infesting *Zanthoxylum* sp.), *Cosella chinensis* sp. nov. (infesting *Amesiodendron chinense*), *Cosella symplocoae* sp. nov. (infesting *Symplocos cochinchinensis*), *Cosella fleschneri* (Keifer, 1959) (infesting *Schima* sp.), *Cosella speciosae* sp. nov. (infesting *Lagerstromemia speciosa*), *Disella hainanensis* sp. nov. (infesting *Litchi chinensis*), *Nonthaburinus litchi* Chandrapatya, 1996 (infesting *L. chinensis*), *Cecidophyes hainani* sp. nov. (infesting *Sym. cochinchinensis*), *Indosetacus levis* sp. nov. (infesting *Lindera* sp.), *Notacaphylla chinieniae* Mohanasundaram & Singh, 1988 (infesting *L. chinensis* and *Dimocarpus longan*), *Tegonotus caryophyllatus* sp. nov. (infesting *Eugenia caryophyllata*), *Shevtchenkella sindorae* sp. nov. (infesting *Sin. cochinchinensis*), *Calepitrimerus linderaus* sp. nov. (infesting *Lindera* sp.), *Abacarus euphoriae* Keifer, 1975 (infesting *D. longan*), *Tetraspinus litchi* sp. nov. (infesting *L. chinensis*), *Thamnacus burmanus* sp. nov. (infesting *Cinnamomum burmanni*), *Diptilomiopus lobbianus* sp. nov. (infesting *Gonocaryum lobbianum*), and *Asetacus triangulus* sp. nov. (infesting *Sym. cochinchinensis*). A key to the families, subfamilies, and species of Eriophyoid mites from Hainan is provided.

#### 摘要

本文描述及繪圖17屬、20種海南島節蟬，其中包含15新種及5種舊有種。分別為：*Aberoptus integritas* sp. nov. 為害油桐 (*Sindora cochinchinensis*)、*Apontella succedana* sp. nov. 為害木蠟樹 (*Rhus succedanea*)、*Anothopoda hainanensis* sp. nov. 為害花椒屬 (*Zanthoxylum* sp.)、*Cosella chinensis* sp. nov. 為害細子龍 (*Amesiodendron chinense*)、*Cosella symplocoae* sp. nov. 為害鐵鏽葉山礬 (*Symplocos cochinchinensis*)、*Cosella fleschneri* (Keifer, 1959) 為害木荷屬 (*Schima* sp.)、*Cosella speciosae* sp. nov. 為害大花紫薇 (*Lagerstromemia speciosa*)、*Disella hainanensis* sp. nov. 為害荔枝 (*Litchi chinensis*)、*Nonthaburinus litchi* Chandrapatya, 1996 為害荔枝 (*L. chinensis*)、*Cecidophyes hainani* sp. nov. 為害鐵鏽葉山礬 (*Sym. cochinchinensis*)、*Indosetacus levis* sp. nov. 為害釣樟屬 (*Lindera* sp.)、*Notacaphylla chinieniae* Mohanasundaram & Singh, 1988 為害荔枝及龍眼 (*L. chinensis* 及 *Dimocarpus longan*)、*Tegonotus caryophyllatus* sp. nov. 為害大葉丁香 (*Eugenia caryophyllata*)、*Shevtchenkella sindorae* sp. nov. 為害油桐 (*Sin. cochinchinensis*)、*Calepitrimerus linderaus* sp. nov. 為害釣樟屬 (*Lindera* sp.)、*Abacarus euphoriae* Keifer, 1975 為害龍眼 (*D. longan*)、*Tetraspinus litchi* sp. nov. 為害荔枝 (*L. chinensis*)、*Thamnacus burmanus* sp. nov. 為害陰香 (*Cinnamomum burmanni*)、*Diptilomiopus lobbianus* sp. nov. 為害瓊楠 (*Gonocaryum lobbianum*) 及 *Asetacus triangulus* sp. nov. 為害鐵葉灰木 (*Sym. cochinchinensis*)。本文並對海南產節蟬的科、亞科及種做一檢索表。

**Key words:** eriophyoid mites, new species, Hainan

**關鍵詞:** 節蟬、新種、海南

Full Text: [PDF \(2.71 MB\)](#)

下載其它卷期全文 Browse all articles in archive: <http://entsocjournal.yabee.com.tw>

## Eriophyoid Mites of Hainan, China (Acari: Eriophyoidea)

**Kun-Wei Huang\*** Department of Zoology, National Museum of Natural Science, 1 Kuan Chien Road, Taichung 404, Taiwan

**Lisheng Cheng** South China University of Tropical Agriculture, Danzhou, 571737, Hainan, China

### ABSTRACT

In this work, we describe and illustrate two families, seven subfamilies, 17 genera, and 20 species of Eriophyoidea, including 15 new species and five known species, from Hainan Island (South China): *Aberoptus integritas* sp. nov. (infesting *Sindora cochinchinensis*), *Apontella succedana* sp. nov. (infesting *Rhus succedanea*), *Anothopoda hainanensis* sp. nov. (infesting *Zanthoxylum* sp.), *Cosella chinensis* sp. nov. (infesting *Amesiodendron chinense*), *Cosella symplocae* sp. nov. (infesting *Symplocos cochinchinensis*), *Cosella fleschneri* (Keifer, 1959) (infesting *Schima* sp.), *Cosella speciosae* sp. nov. (infesting *Lagerstromemia speciosa*), *Disella hainanensis* sp. nov. (infesting *Litchi chinensis*), *Nonthaburinus litchi* Chandrapatya, 1996 (infesting *L. chinensis*), *Cecidophyes hainani* sp. nov. (infesting *Sym. cochinchinensis*), *Indosetacus levis* sp. nov. (infesting *Lindera* sp.), *Notacaphylla chinensiae* Mohanasundaram & Singh, 1988 (infesting *L. chinensis* and *Dimocarpus longan*), *Tegonotus caryophyllatus* sp. nov. (infesting *Eugenia caryophyllata*), *Shevtchenkella sindorae* sp. nov. (infesting *Sin. cochinchinensis*), *Calepitrimerus linderaus* sp. nov. (infesting *Lindera* sp.), *Abacarus euphoriae* Keifer, 1975 (infesting *D. longan*), *Tetraspinus litchi* sp. nov. (infesting *L. chinensis*), *Thamnacus burmanus* sp. nov. (infesting *Cinnamomum burmanni*), *Diptilomiopus lobbianus* sp. nov. (infesting *Gonocaryum lobbianum*), and *Asetacus triangulus* sp. nov. (infesting *Sym. cochinchinensis*). A key to the families, subfamilies, and species of Eriophyoid mites from Hainan is provided.

**Key words:** eriophyoid mites, new species, Hainan

### Introduction

Hainan Province, called "Qiong" for short and encompassing Hainan Island, is situated off the southwestern coast of South China. Haikou is its capital. The

island, rising from the vast South China Sea, has a total population of eight million. Hainan Island has a monsoon tropical climate with an annual average temperature of 22-26°C and annual rainfall of 1500-2000 mm.

\*Correspondence address  
e-mail: eri@mail.nmns.edu.tw

In 2000, the first author joined in a cooperative effort with the second author to study the eriophyoid mites of Hainan Island. We made two trips to collect eriophyoid mites in Hainan. We collected about 30 species of eriophyoid mites. From that survey, we report 20 species of eriophyoid mites in Hainan in this paper, of which 15 are new to science. The mites belong to two families (Eriophyidae and Diptilomiopidae), seven subfamilies, and 17 genera. Among them, 16 genera were represented by a single species, i.e., *Aberoptus*, *Apontella*, *Anothopoda*, *Disella*, *Nonthaburinus*, *Cecidophyes*, *Indosetacus*, *Notacaphylla*, *Tegonotus*, *Shevtchenkella*, *Caleitrimerus*, *Tetraspinus*, *Thamnacus*, *Abacarus*, *Diptilomiopus*, and *Asetacus*, while the genus *Cosella* had four species.

From the results of this study, the eriophyoid fauna of Hainan was determined to be of the tropical type. The frequency of the Nothopodinae 40% (8/20) was markedly higher than that of the other subfamilies.

Specimens are temporarily deposited in the National Museum of Natural Science (NMNS), Taichung, Taiwan. We will ultimately deposit the holotype and some paratypes in suitable institutions in China. All measurement units are in micrometers ( $\mu\text{m}$ ). The terminology and abbreviations in the diagrams follow those of Lindquist (1996) and Huang (1999).

The illustrations are mainly based on the holotype, while the measurements are based on the holotype, paratypes, and some other non-type specimens.

In the text, the 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 (—). For example, Dt-Dt means the distance between the scapular tubercles, and Ct1\Ct2 means the oblique distance from the 1<sup>st</sup> coxal tubercles to the 2<sup>nd</sup> coxal tubercles.

**Key to families and subfamilies of Eriophyoid mites of Hainan (modified from Amrine, 2003)**

1. Ganthosoma usually small in comparison to body; when large, chelicerae straight or slightly curved; pedipalps with short and truncate terminal segments and enclosing short-form oral stylet; legs with usual segments and setae or with various reductions or modifications; empodia usually entire...**ERIOPHYIDAE** Nalepa, 1898 ..... 2
- Gnathosoma large in comparison to body; chelicerae abruptly curved and bent down near base; pedipalps attenuate, enclosing long-form oral stylet; legs with standard setae or with various reductions; empodia often large, either entire or divided...**DIPTILOMIOPIDAE** Keifer, 1944..... 5
2. Tibiae reduced or completely fused with tarsi; tibia I without seta ..... 3
- Tibiae always distinct from tarsi, tibia I with setae usually present in a few genera ..... 4
3. Pedipalp apices or tarsi of legs I with spatulate or shovel-shaped projections; legs, when lacking spatulate appendages, very stout, segments shortened or combined; empodia large ..... **Aberoptinae** Keifer, 1966
- Spatulate projections absent from pedipalp apices and tarsi of legs I often fused across center line with faint or absent sternal line; coxa I usually without seta *1b*; empodia relatively small..... **Nothopodinae** Keifer, 1956
4. Female genital apodeme bent upward and shortened, usually appearing as a heavy transverse line in ventral view; ridges on female genital coverflap typically in 2 uneven ranks; female genitalia in lateral view usually noticeably projecting from venter, appressed to coxae, separating coxae more than normal; coxa I usually narrowly connate at center line, sternal line

- shortened; coxae, especially coxa I, often with curved lines outlining produced tubercles of setae 1a. Nine genera lacking scapular setae on prodorsal shield.....  
 ..... **Cecidophyinae** Keifer, 1966
- . Female genital apodeme usually extending a moderate distance forward, not appearing as a heavy transverse bar in ventral view; body usually more fusiform; prodorsal shield usually with a broad-based rigid frontal lobe over gnathosoma; opisthosoma typically divided into broad stout dorsal annuli, and narrow, microtuberculate ventral annuli; if frontal lobe absent or only a slight one present, then annuli differ dorsoventrally, at least in larger dorsal microtubercles; if annuli subequal, and the broad frontal lobe absent, then with laterally thick shield lobe or dorsal annuli with lobes .....  
 ..... **Phyllocoptinae** Nalepa, 1892
5. Empodium divided, usually deeply .....  
 ..... **Diptilomiopinae** Keifer, 1944
- . Empodium entire.....  
 . **Rhyncaphyoptinae** Roivainen, 1953

**Aberoptinae Keifer, 1966**

Aberoptinae Keifer, 1966: 2  
 Type genus: *Aberoptus* Keifer, 1951

***Aberoptus integritas* sp. nov.** (Fig. 1)

**Female:** Body flattened, fusiform, 190 long, shield 29 long, 67 wide, shield lobe present, with lobes at rear margin; rostrum short and downcurved; shield design with complete median line, admedian lines diverging to rear, with transverse lines directed to lateral sides, 2 submedian lines parallel; scapular tubercles on rear shield margin, setae (sc) 18 long, directed posteriorly and diverging, Dt-Dt 36 apart; leg stout, tibial fused with tarsus, fore tibia setae (1') absent, tarsus with shovel-shaped projections; coxal area smooth; 1st

coxal setae (1b) 5 long, Ct1-Ct1 16 apart, 2nd coxal setae (1a) 13 long, Ct2-Ct2 15 apart, 3rd coxal setae (2a) 27 long, Ct3-Ct3 34 apart, Ct1\Ct2 17, Ct1-Ct2 7, Ct2\Ct3 24, Ct2-Ct3 9; solenidion ending as a knob; empodium simple, fore empodium 6-rayed, hind empodium expanded, with bristles. Opisthosoma: dorsum flattened, with about 66 sparse microtuberculate rings; 1st 3 dorsal annuli 6 long; ventral annuli with about 68 microtuberculate rings; lateral setae (c2) 18 long, Lt-Lt 63 apart, Lt\Vt1 56, Lt-Vt1 29; 1st ventral setae (d) 28 long, Vt1-Vt1 38 apart, Vt1\Vt2 39, Vt1-Vt2 30; 2nd ventral setae (e) 17 long, Vt2-Vt2 19 apart, Vt2\Vt3 82, Vt2-Vt3 80; 3rd ventral setae (f) 18 long, Vt3-Vt3 17 apart; accessory setae (h1) present. Coverflap: 21 wide, 13 long, with 8 longitudinal ridges, genital setae (3a) 12 long, Gt-Gt 14 apart.

**Male:** not seen.

**Type data:** **Holotype**, ♀, Hainan: Tanchou City; 19-Sept.-2000, K. W. Huang; ex. *Sindora cochinchinensis* Benth. (Caesalpiniaceae). (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 *A. cerostructor* Flechtmann, 2001 but differs in the shield having a complete median line, the coverflap having longitudinal ridges, and the 6-rayed fore empodium.

**Etymology:** This new name means "complete" in reference to the shield design with median, admedian, and submedian lines.

**Nothopodinae Keifer, 1956**

Nothopodinae Keifer, 1956: 163  
 Colopodinae Mohanasundaram, 1984: 253

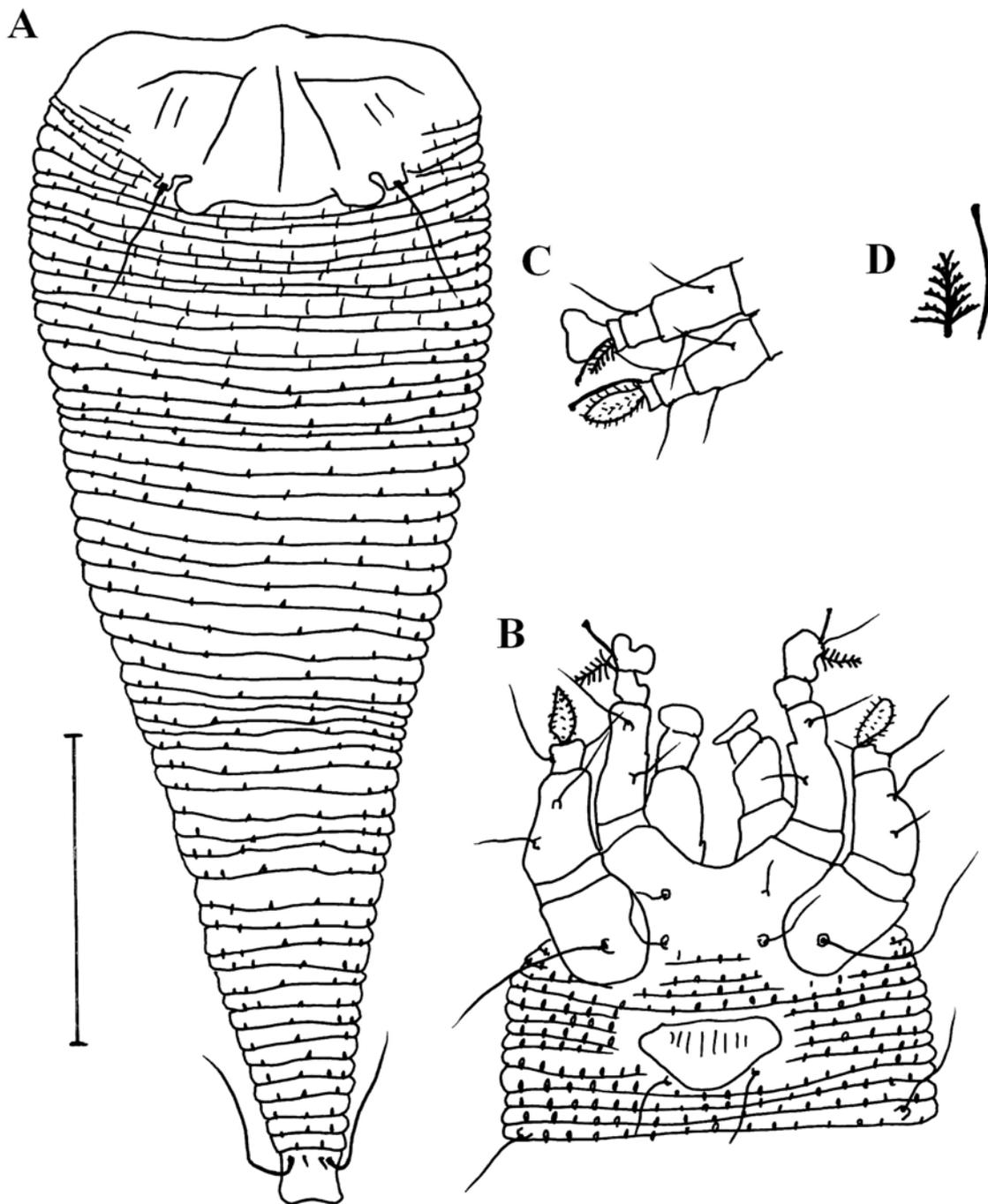


Fig. 1. *Aberoptus integritas* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, legs, lateral view; D, fore empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

Type genus: *Nothopoda* Keifer, 1951

**Key to species of the Nothopodinae of Hainan**

1. Coxa I with setae *1b* present; coxae of legs I usually weakly divided; scapular setae ahead of rear shield margin, directed upward and centrad; tibia of legs I completely fused with tarsus.....  
**Colopodacini** Mohanasundaram, 1984  
.....*Apontella succedana* sp. nov.
- . Coxa I without setae *1b*; coxa of legs I either separate or fused across midline; scapular setae and tibia of legs I variable...**Nothopodini** Keifer, 1956.. 2
2. Scapular tubercles and setae absent; opisthosomal setae *e* absent.....  
.....*Anothopoda hainanensis* sp. Nov.
- . Scapular tubercles and setae present; opisthosomal setae *e* variable ..... 3
3. Coxae of legs I fused without sternal line; scapular setae directed posterolaterally .....*Cosella* Newkirk & Kefier, 1975.... 5
- . Coxae I separated by a short or moderately long sternal line..... 4
4. Opisthosomal annuli with low, central ridge and no lateral projections; coxae smooth .....*Disella hainanensis* sp. nov.
- . Opisthosomal annuli with a pronounced dorsal median ridge and long, narrow lateral projections; coxae I with granules.....  
*Nonthaburinus litchi* Chandrapatya, 1996
5. Shield design with complete median line..... 6
- . Shield design with incomplete median line..... 7
6. Empodium 5-rayed .....  
.....*Cosella fleschneri* (Keifer, 1959)
- . Empodium 4-rayed .....  
.....*Cosella symplocoae* sp. nov.
7. Shield design with 4 transverse lines...  
.....*Cosella chinensis* sp. nov.
- . Shield design with 3 transverse lines...  
.....*Cosella speciosae* sp. nov.

**Colopodacini Mohanasundaram, 1984**

Colopodacini Mohanasundaram, 1984: 253

- : Huang, 2001a: 38

Type genus: *Colopodacus* Keifer, 1960

***Apontella succedana* sp. nov.** (Fig. 2)

**Female:** Body fusiform-shaped, 138 long, shield 42 long, 54 wide, shield lobe present; shield design with complete median and admedian lines, parallel, with 3 transverse lines between median and admedian lines, submedian line along anterolateral margin; scapular tubercles set ahead of rear shield margin, set on submedian line, scapular setae 6 long, directed laterally, Dt-Dt 44 apart. Legs: tibiae fused with tarsi; fore coxal area with granules; 1st coxal setae 5 long, Ct1-Ct1 10 apart, 2nd coxal setae 6 long, Ct2-Ct2 9 apart, 3rd coxal setae 12 long, Ct3-Ct3 22 apart, Ct1\Ct2 11, Ct1-Ct2 5, Ct2\Ct3 15, Ct2-Ct3 8; solenidion ending as knob; empodium simple, 4-rayed.

Opisthosoma: dorsum with median furrow, dorsal annuli with 36 rings, 1st 3 dorsal annuli 4 long; ventral annuli with 43 microtuberculate rings; lateral setae 18 long, Lt-Lt 36 apart, Lt\Vt1 35, Lt-Vt1 23; 1st ventral setae 23 long, Vt1-Vt1 24 apart, Vt1\Vt2 32, Vt1-Vt2 30; 2nd ventral setae 5 long, Vt2-Vt2 10 apart, Vt2\Vt3 34, Vt2-Vt3 31; 3rd ventral setae 15 long, Vt3-Vt3 18 apart; accessory setae absent.

Coverflap: 17 wide, 10 long, with a longitudinal ridge at center, 3 cross lines at each side, genital setae 10 long, Gt-Gt 10 apart.

**Male:** Not seen.

**Type data:** **Holotype** ♀, Hainan: Lingshui county, 23-Sept.-2000, K. W. Huang; ex *Rhus succedanea* (Anacardiaceae). (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 resembles *A.*

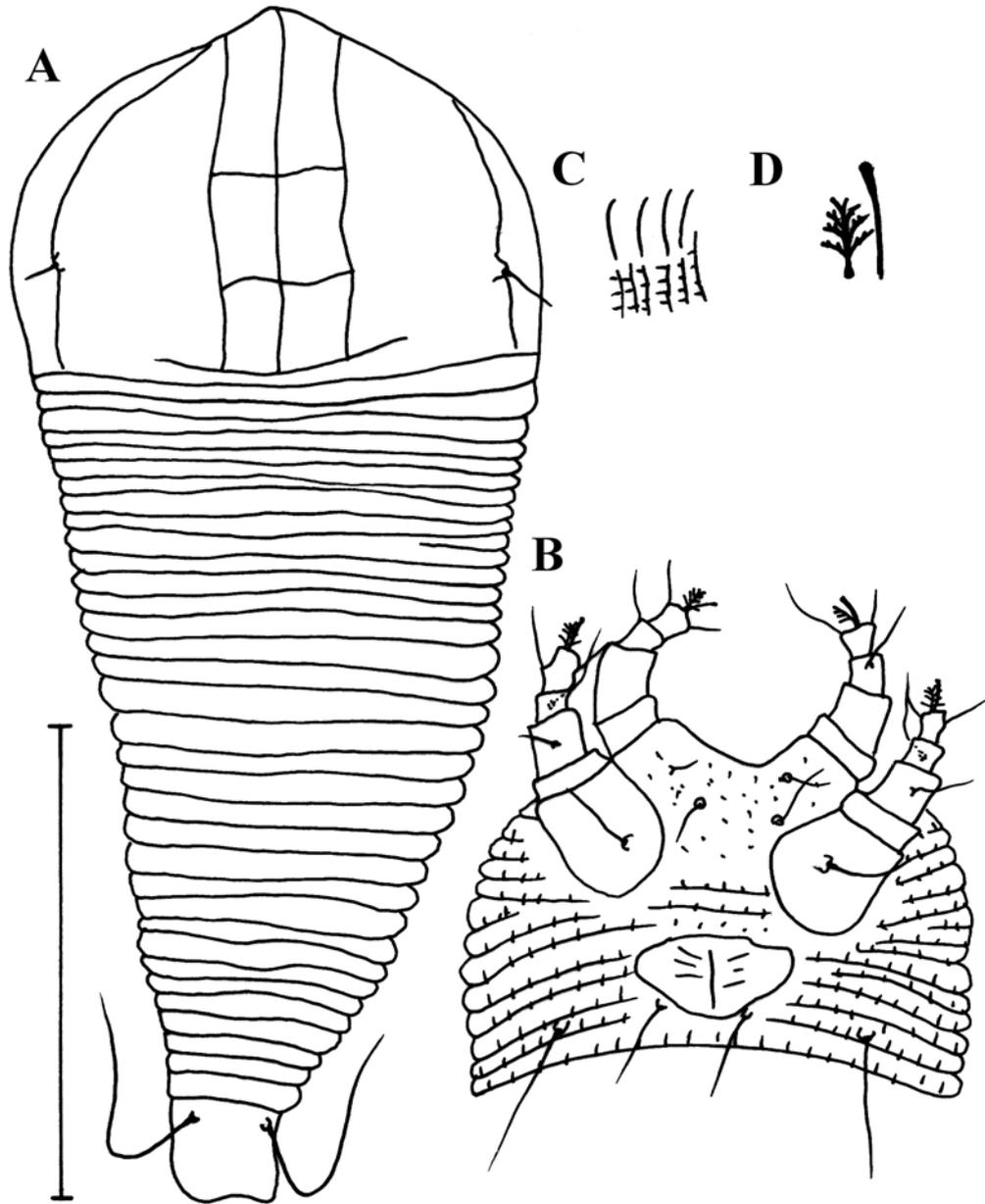


Fig. 2. *Apontella succedana* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidium. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

*bravaisiae* Boczek & Nuzzaci, 1988 but differs in the shield design having 3 transverse lines between the median and admedian lines and

coverflap having a longitudinal ridge in the center.

**Nothopodini Keifer, 1956**

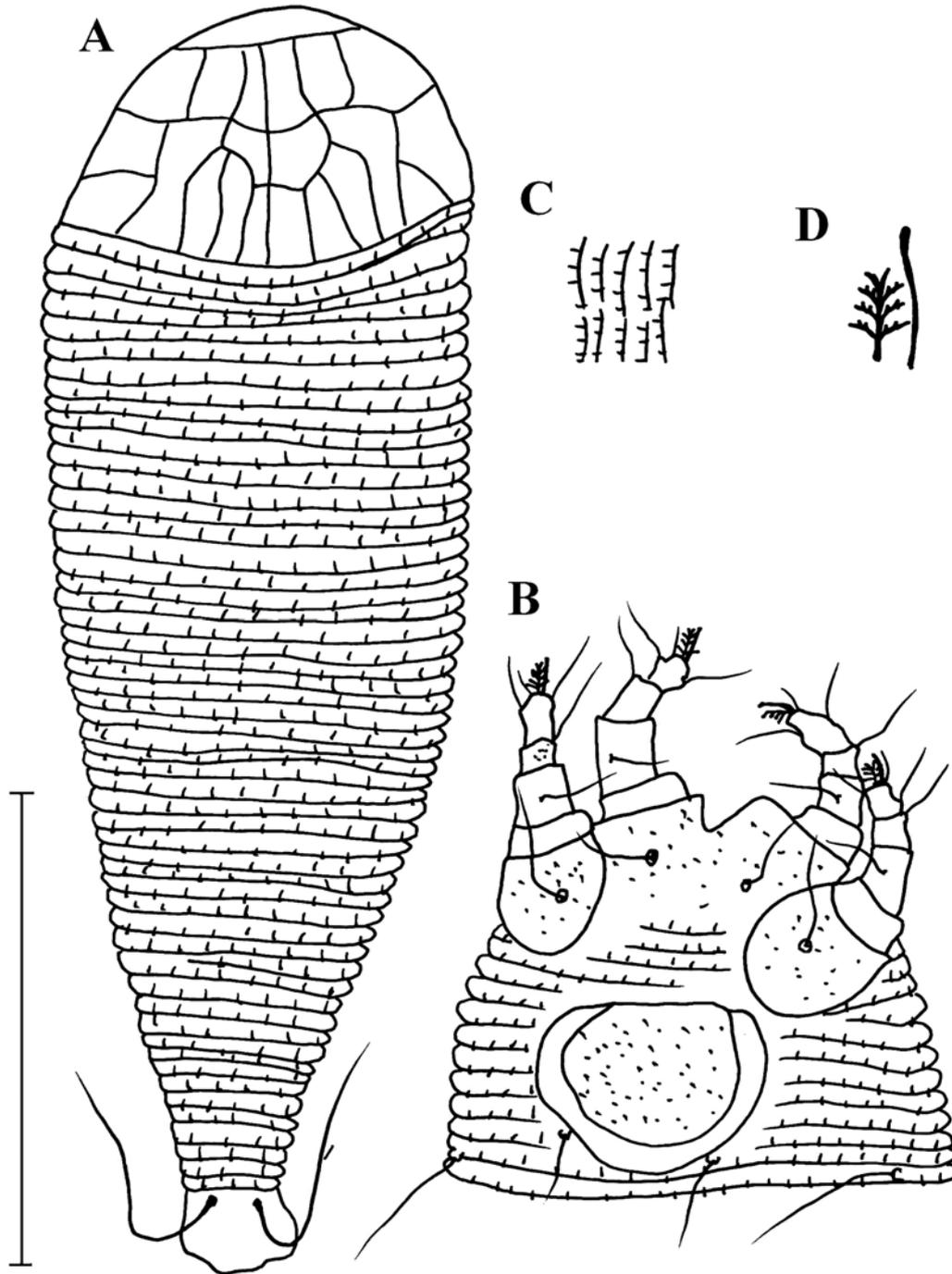


Fig. 3. *Anothopoda hainanensis* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

Nothopodini Keifer, 1956: 163  
Type genus: *Nothopoda* Keifer, 1951

***Anothopoda hainanensis* sp. nov.** (Fig. 3)

**Female:** Body fusiform, 154 long, shield 35 long, 56 wide, shield lobe absent; shield design with median line and admedian lines from base to basal 4/5, with 3 transverse lines connected to median line, 1 each at basal 1/3, middle, and 3/4, transverse line at 3/4 directed to lateral margin, with 1 forked line directed posteriorly, middle one directed to lateral margin, 2 forked lines connected to admedian lines at basal 2/5, directed posteriorly, submedian lines bifurcate in basal 1/3; scapular tubercles and setae absent. Legs: coxal area with granules; 1st coxal tubercles and setae absent, 2nd coxal setae 5 long, Ct2-Ct2 12 apart, 3rd coxal setae 9 long, Ct3-Ct3 26 apart, Ct2\Ct3 19, Ct2-Ct3 9; solenidion ending as knob; empodium simple, 4-rayed.

Opisthosoma: dorsum arched, dorsal and ventral annuli with about 56 spine-like microtuberculate rings, 1st 3 annuli 5 long; lateral setae 17 long, Lt-Lt 46 apart, Lt\Vt1 46, Lt-Vt1 25; 1st ventral setae 20 long, Vt1-Vt1 33 apart; 2nd ventral tubercles and setae absent; 3rd ventral setae 17 long, Vt3-Vt3 19 apart; accessory setae absent.

Coverflap: 24 wide, 16 long, with granules, genital setae 7 long, Gt-Gt 17 apart.

**Male:** not seen.

**Type data:** **Holotype** ♀, Hainan: Lingshui county, 23-Sept.-2000, K. W. Huang; ex *Zanthoxylum* (Rutaceae). (deposited at NMNS). **Paratypes**, 5 ♀, data same as for holotype.

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

**Note:** This new species resembles *A. zuihoenae* Huang & Wang, 2003 but

differs in the shield design having incomplete admedian lines and the 2 forked lines connected to admedian lines at the basal 2/5.

***Disella hainanensis* sp. nov.** (Fig. 4)

**Female:** Body fusiform, 142 long, shield 38 long, 59 wide, shield lobe present, shield design with median line from base to basal 4/5, admedian lines complete, subparallel, with 3 transverse lines at basal 1/4, 1/2 and 3/4, 2nd transverse line forked, connected to 3rd transverse line, 3rd transverse line along anterolateral margin, 1 submedian line from basal 1/4 to 1/2; scapular tubercles set ahead of rear shield margin, set on submedian line, Dt-Sr 10 long, setae 6 long, directed centrad, Dt-Dt 29 apart; leg segments tibiae fused with tarsi; coxal area smooth; 1st coxal tubercle absent, 2nd coxal setae 6 long, Ct2-Ct2 11 apart, 3rd coxal setae 8 long, Ct3-Ct3 32 apart, Ct2\Ct3 22, Ct2-Ct3 11; claw ending as knob; empodium simple, 4-rayed.

Opisthosoma: dorsum flattened, dorsal annuli with 39 rings, 1st 3 dorsal annuli 9 long; ventral annuli with 56 microtuberculate rings; lateral setae 13 long, Lt-Lt 54 apart, Lt\Vt1 52, Lt-Vt1 28; 1st ventral setae 17 long, Vt1-Vt1 35 apart, Vt1\Vt2 36, Vt1-Vt2 27; 2nd ventral setae 7 long, Vt2-Vt2 15 apart, Vt2\Vt3 33, Vt2-Vt3 28; 3rd ventral setae 13 long, Vt3-Vt3 20 apart; accessory setae absent.

Coverflap: 26 wide, 17 long, with granules, genital setae 5 long, Gt-Gt 17 apart.

**Male:** not seen.

**Type data:** **Holotype** ♀, Hainan: Tanchou City, 24-Sept.-2000, K. W. Huang; ex *Litchi chinensis* (Sapindaceae). (deposited at NMNS). **Paratypes**, 2 ♀, data same as for holotype.

**Relation to host:** A vagrant on the lower

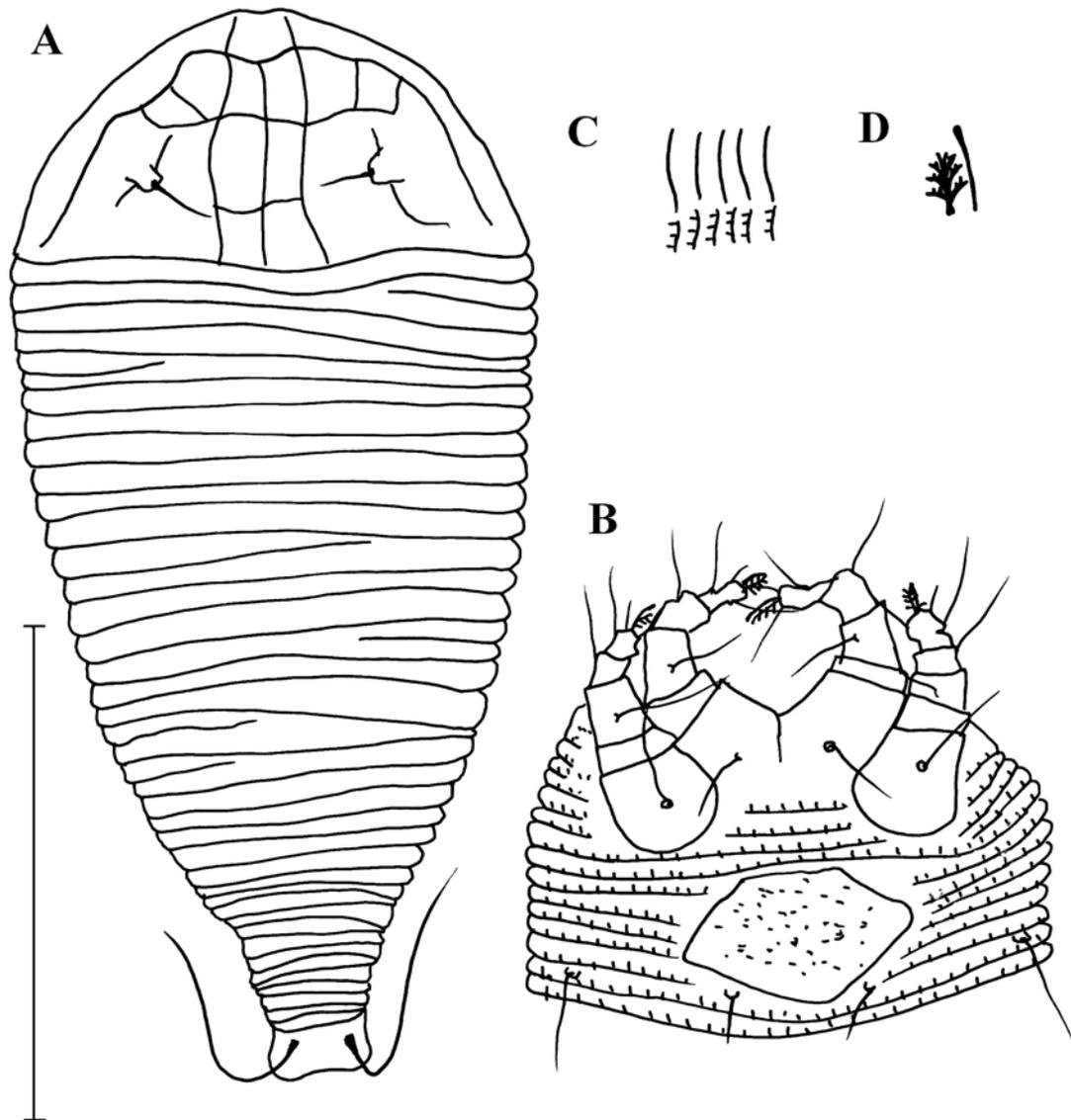


Fig. 4. *Disella hainanensis* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

leaf surface. No apparent damage was observed.

**Note:** This new species resembles *D. vagrans* Mohanasundaram, 1986 but differs in the shield design with 3rd transverse line without forked line directed to anterior margin, and scapular setae directed centrad. *Disella litchi*

Kuang & Feng, 1990 was a misidentification; it should be *Notacaphylla chinensiae* Mohanasundaram & Singh, 1988

***Nonthaburinus litchi* Chandrapatya, 1996** (Fig. 5)

**Female:** Body fusiform, 153 long, shield

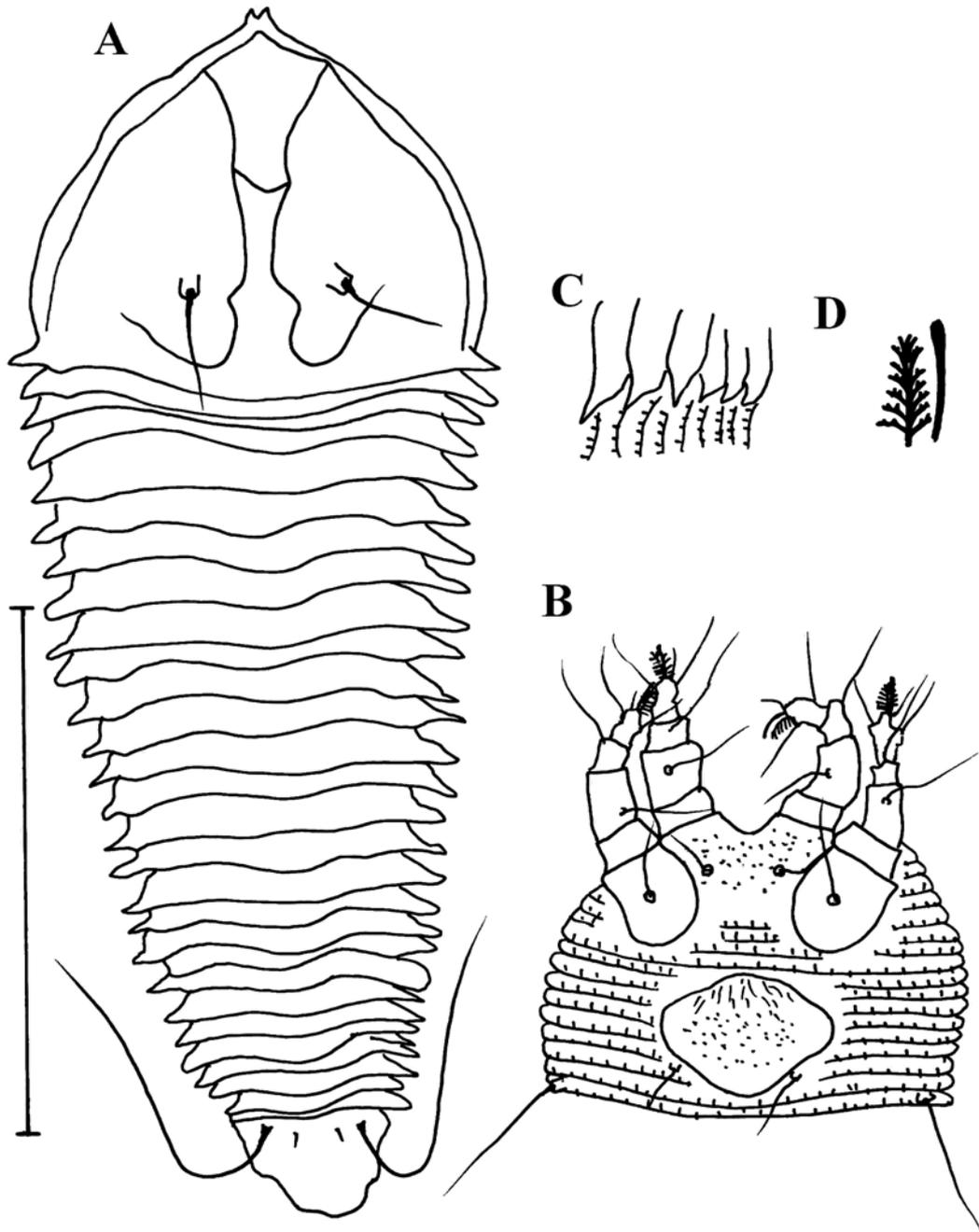


Fig. 5. *Nonthaburinus litchi* Chandrapatya, 1996 (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

48 long, 52 wide, shield lobe present, divided, shield design lacking median line, admedian lines complete, with a transverse line at basal 3/5, fishhook-like at base, submedian line absent; scapular tubercles set ahead of rear shield margin, set on submedian line, Dt-Sr 14 long, setae 11 long, directed posteriorly, Dt-Dt 18 apart; leg segment tibiae fused with tarsi; fore coxal area with granules; 1st coxal tubercle absent, 2nd coxal setae (1a) 10 long, Ct2-Ct2 9 apart, 3rd coxal setae 11 long, Ct3-Ct3 22 apart, Ct2\Ct3 15, Ct2-Ct3 7; claw ending as knob; empodium simple, 7-rayed.

Opisthosoma: dorsum with median ridges, with lateral projections, dorsal annuli with 26 rings, 1st 3 dorsal annuli 7 long; ventral annuli with 56 microtuberculate rings; lateral setae 23 long, Lt-Lt 45 apart, Lt\Vt1 42, Lt-Vt1 25; 1st ventral setae 35 long, Vt1-Vt1 25 apart, Vt1\Vt2 40, Vt1-Vt2 33; 2nd ventral setae 25 long, Vt2-Vt2 22 apart, Vt2\Vt3 37, Vt2-Vt3 33; 3rd ventral setae 10 long, Vt3-Vt3 12 apart; accessory setae present.

Coverflap: 18 wide, 14 long, with granules, several dashed lines at base, genital setae 6 long, Gt-Gt 15 apart.

**Male:** not seen.

**Specimens examined:** 3 ♀, Hainan: Tanchou City, 24-Sept.-2000, K. W. Huang; ex *Litchi chinensis* (Sapindaceae). (deposited at NMNS).

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

**Distttribution:** Thailand and China (new record).

***Cosella fleschneri* (Keifer, 1959)**

*Floracarus fleschneri* Keifer, 1959

*Cosella fleschneri* Keifer, 1975b: 13

- : Huang, 2001, 2003: 325

**Female:** Body fusiform-shaped, 107 long, shield 36 long, 61 wide; scapular tubercles set ahead of rear shield margin, Dt-Sr 11 long, scapular setae 11 long, Dt-Dt 26 apart; empodium simple, 4- rayed.

Opisthosoma: dorsum flattened, dorsal annuli with 54 rings, 1st 3 dorsal annuli 4 long; ventral annuli with 56 microtuberculate rings.

Coverflap: 24 wide, 16 long, with granules, genital setae 6 long, Gt-Gt 17 apart.

**Male:** not seen.

**Specimens examined:** 2 ♀, Hainan: Changchiang County, 20-Sept.-2000, K. W. Huang; ex *Schina* sp. (Theaceae). (deposited at NMNS).

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

**Distttribution:** India, Taiwan and China (new record).

***Cosella symplocoae* sp. nov.** (Fig. 6)

**Female:** Body fusiform-shaped, 177 long, shield 38 long, 72 wide, shield lobe present, shield design with complete median line and admedian lines, with transverse lines at basal 1/4, 1/2, and 3/4, 1st transverse line at basal 3/4 extending to lateral margin, with forked line directed to 2nd transverse line, 2nd transverse line extending to lateral side, submedian line from basal 1/3 to 1/2, connecting to 2nd transverse line; scapular tubercles set ahead of rear shield margin, Dt-Sr 16 long, scapular setae 13 long, directed upwards and posteriorly, Dt-Dt 28 apart; leg segment tibiae fused with tarsi; coxal area with granules; 1st coxal tubercle absent, 2nd coxal setae 7 long, Ct2-Ct2 11 apart, 3rd coxal setae 10 long, Ct3-Ct3 27 apart, Ct2\Ct3 20, Ct2-Ct3 10; claw ending as knob; empodium simple, 4-rayed.

Opisthosoma: dorsum flattened, dorsal

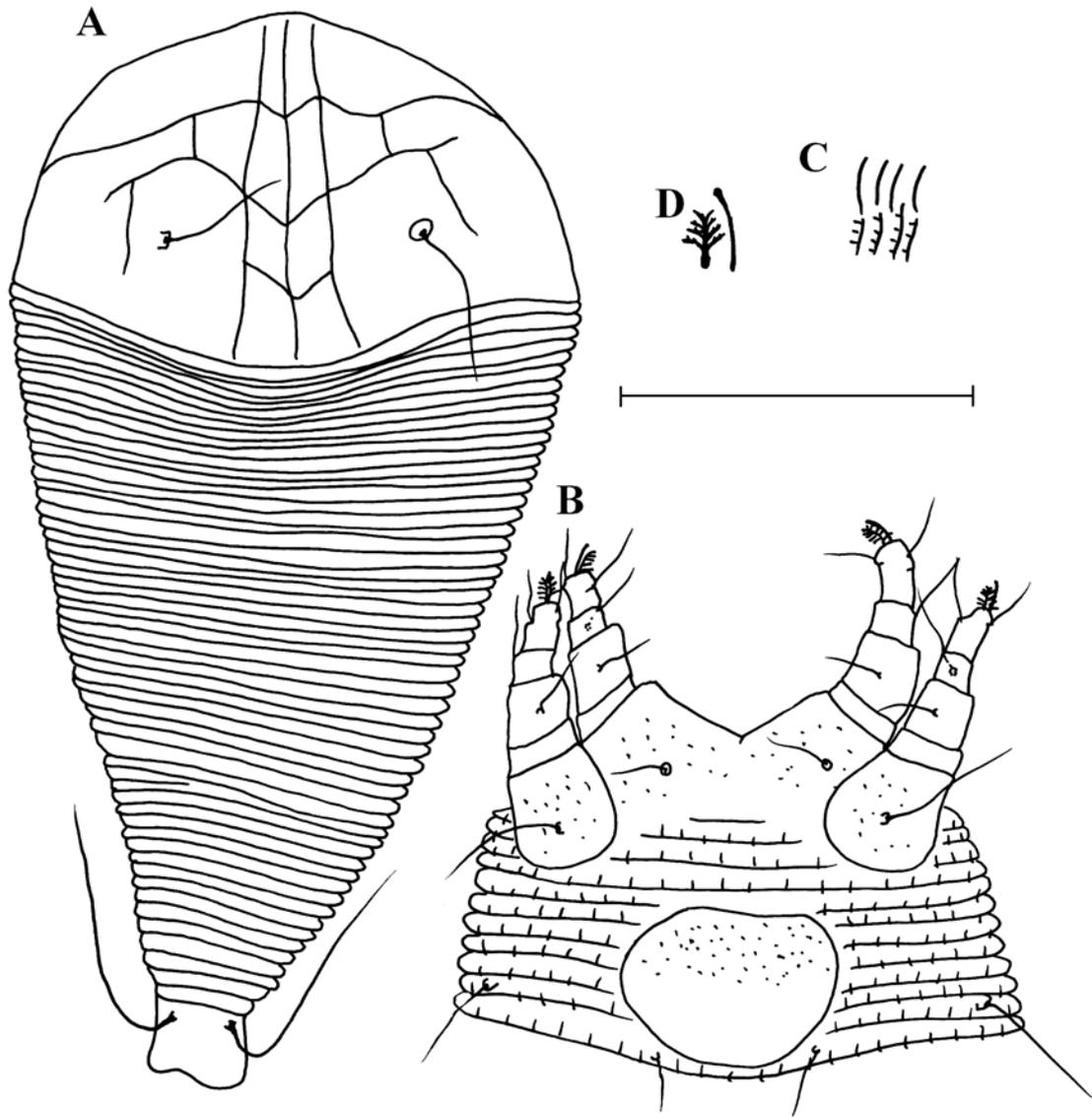


Fig. 6. *Cosella sympllocae* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$  m; C = 40  $\mu$  m; D = 15  $\mu$  m)

annuli with 51 microtuberculate rings, 1st 3 dorsal annuli 11 long; ventral annuli with 56 microtuberculate rings; lateral setae 17 long, Lt-Lt 50 apart, Lt\Vt1 58, Lt-Vt1 36; 1st ventral setae 29 long, Vt1-Vt1 38 apart, Vt1\Vt2 48, Vt1-Vt2 40; 2nd ventral

setae 8 long, Vt2-Vt2 20 apart, Vt2\Vt3 43, Vt2-Vt3 39; 3rd ventral setae 13 long, Vt3-Vt3 17 apart; accessory setae absent.

Coverflap: 24 wide, 17 long, with granules at base, genital setae 6 long, Gt-Gt 15 apart.

**Male:** not seen.

**Type data:** **Holotype** ♀, Hainan: Lingshui County, 22-Sept.-2000, K. W. Huang; ex *Symplocos cochichinensis* (Symplocaceae). (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 resembles *C. hancei* Huang, 2003 but differs in the shield design without a forked line at the 1st transverse lines and 4-rayed empodium.

*Cosella chinensis* sp. nov. (Fig. 7)

**Female:** Body fusiform-shaped, 116 long, shield 30 long, 53 wide, shield lobe present, shield design with median line from base to basal 5/6, admedian lines complete, sinuous, with 4 transverse lines between median and admedian lines at basal 1/4, 1/2, 3/4, and 5/6, 1st transverse line at basal 5/6 extending to lateral margin, 3rd transverse line with forked lines directed to lateral sides, submedian line from basal 1/3 to 1/2, connecting to 3rd transverse line; scapular tubercles set ahead of rear shield margin, Dt-Sr 9 long, scapular setae 36 long, directed upwards and posteriorly, Dt-Dt 23 apart; leg segment tibiae fused with tarsi; coxal area with granules; 1st coxal tubercle absent, 2nd coxal setae 5 long, Ct2-Ct2 7 apart, 3rd coxal setae 9 long, Ct3-Ct3 20 apart, Ct2\Ct3 14, Ct2-Ct3 8; claw ending as knob; empodium simple, 4-rayed.

Opisthosoma: dorsum flattened, dorsal annuli with 43 rings, 1st 3 dorsal annuli 5 long; ventral annuli with 49 microtuberculate rings; lateral setae 12 long, Lt-Lt 40 apart, Lt\Vt1 40, Lt-Vt1 22; 1st ventral setae 18 long, Vt1-Vt1 29 apart, Vt1\Vt2 30, Vt1-Vt2 24; 2nd ventral setae 4 long, Vt2-Vt2 11 apart, Vt2\Vt3 29, Vt2-

Vt3 26; 3rd ventral setae 12 long, Vt3-Vt3 17 apart; accessory setae absent.

Coverflap: 20 wide, 12 long, with granules at base, genital setae 6 long, Gt-Gt 14 apart.

**Male:** not seen.

**Type data:** **Holotype** ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex *Amesiodendron chinense* (Sapindaceae). (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 resembles *C. zeylanica* Huang, 2001 but differs in the shield design with complete admedian lines and in having 4 transverse lines between the median and admedian lines.

*Cosella speciosae* sp. nov. (Fig. 8)

**Female:** Body fusiform-shaped, 155 long, shield 41 long, 55 wide, shield lobe present, shield design with several short lines at each lateral side, median line and admedian lines from base to basal 3/4, converging at basal 3/4, with 3 transverse lines between median and admedian lines at basal 1/4, 1/2, and 3/4, 1st transverse line at basal 3/4 extending to lateral margin, 2nd transverse line directed to 1st transverse line, then directed to rear; scapular tubercles set ahead of rear shield margin, Dt-Sr 15 long, scapular setae 11 long, directed upwards and centrad, Dt-Dt 26 apart; leg segment tibiae fused with tarsi; fore coxal area with granules; 1st coxal tubercle absent, 2nd coxal setae 6 long, Ct2-Ct2 9 apart, 3rd coxal setae 9 long, Ct3-Ct3 22 apart, Ct2\Ct3 17, Ct2-Ct3 10; claw ending as knob; empodium simple, 3-rayed.

Opisthosoma: dorsum flattened, dorsal annuli with 49 rings, 1st 3 dorsal annuli 4 long; ventral annuli with 49

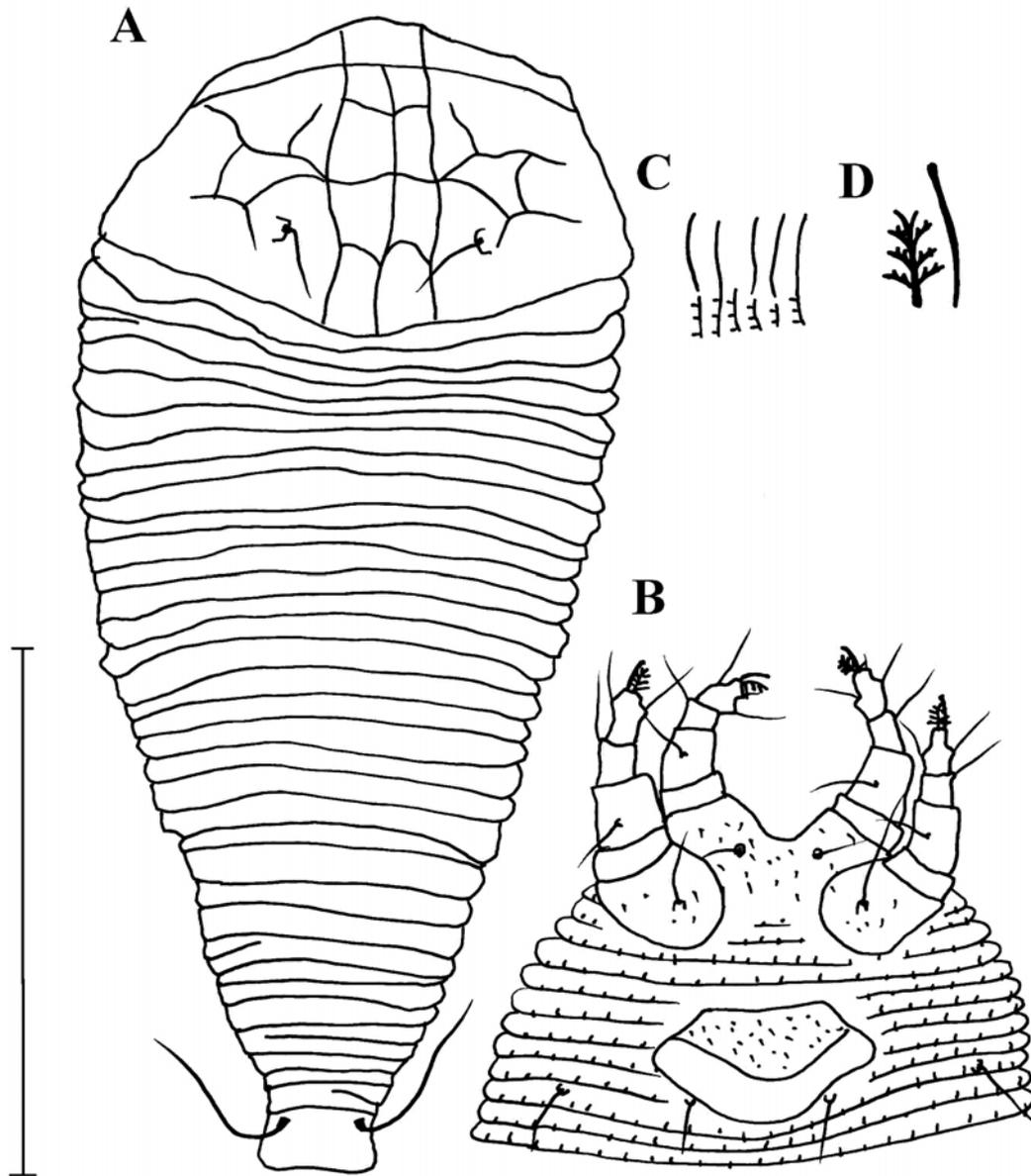


Fig. 7. *Cosella chinensis* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

microtuberculate rings; lateral setae 21 long, Lt-Lt 44 apart, Lt\Vt1 47, Lt-Vt1 30; 1st ventral setae 25 long, Vt1-Vt1 30 apart, Vt1\Vt2 39, Vt1-Vt2 31; 2nd ventral setae 8 long,

Vt2-Vt2 16 apart, Vt2\Vt3 32, Vt2-Vt3 29; 3rd ventral setae 16 long, Vt3-Vt3 16 apart; accessory setae absent.

Coverflap: 20 wide, 13 long, with

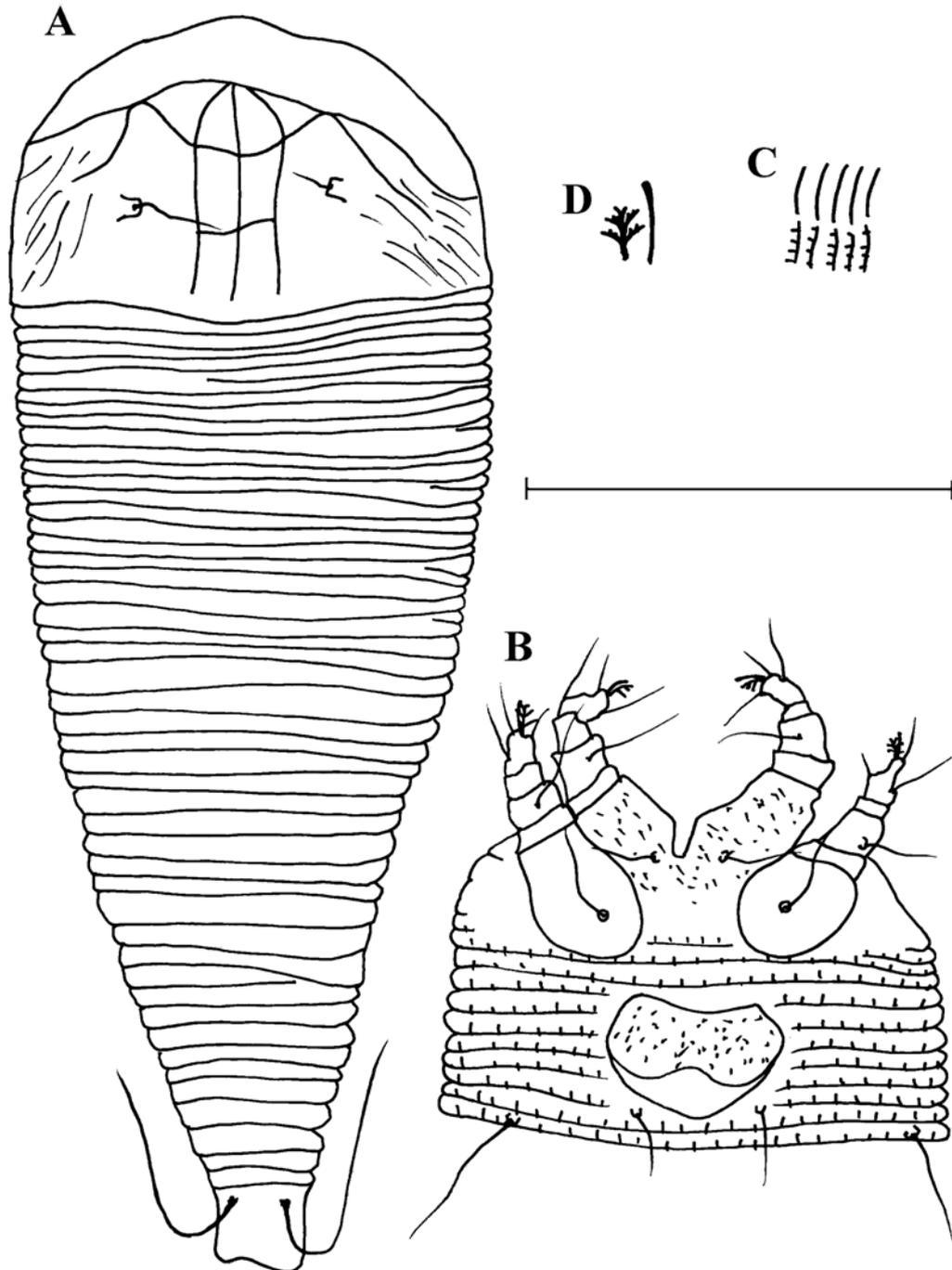


Fig. 8. *Cosella speciosae* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$  m; C = 40  $\mu$  m; D = 15  $\mu$  m)

granules at base, genital setae 6 long, Gt-Gt 13 apart.

**Male:** not seen.

**Type data:** **Holotype** ♀, Hainan: Tanchou City, 24-Sept.-2000, K. W. Huang; ex *Lagerstroemia speciosa* (Lythraceae). (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 resembles *C. tripinnate* Huang, 2001 but differs in the shield design having several lines at each lateral side and in the 2nd transverse line being directed to the 1st transverse line.

#### **Cecidophyinae Keifer, 1966**

Cecidophyinae Keifer, 1966: 15

Type genus: *Cecidophyes* Nalepa, 1887

#### **Key to species of Cecidophyinae of Hainan**

1. Scapular tubercles and setae absent.....  
Cecidophyini .....  
..... *Cecidophyes hainani* sp. nov.
- . Scapular tubercles and setae present...  
Colomerini..... *Indosetacus levis* sp. nov.

#### **Cecidophyinae Keifer, 1966**

Cecidophyinae Keifer, 1966: 15

Type genus: *Cecidophyes* Nalepa, 1887

*Cecidophyes hainani* sp. nov. (Fig. 9)

**Female:** Body fusiform, 168 long; shield 25 long, 66 wide, anterior lobe present; shield design with complete median line and admedian lines, subparallel, with transverse line at basal 1/4, 1/2, and 3/4, 1st transverse line at basal 3/4 extending to lateral margin, 2nd transverse line at 1/2, V-shaped, 2 submedian lines connected to 1st transverse line; scapular tubercle and setae absent; leg segments

normal, fore tibial setae set at 1/2, 5 long; 1st coxal setae 6 long, Ct1-Ct1 11 apart, 2nd coxal setae 9 long, Ct2-Ct2 10 apart, 3rd coxal setae 12 long, Ct3-Ct3 24 apart, Ct1\Ct2 11, Ct1-Ct2 5, Ct2\Ct3 17, Ct2-Ct3 9; genitalia appended to coxae; claw ending as knob; empodium simple, 4-rayed.

**Opisthosoma:** with about 51 microtuberculate rings; 1st 3 rings 9 long; lateral setae 14 long, Lt-Lt 55 apart, Lt\Vt1 55, Lt-Vt1 39; 1st ventral setae 27 long, Vt1-Vt1 39 apart, Vt1\Vt2 42, Vt1-Vt2 31; 2nd ventral setae 6 long, Vt2-Vt2 21 apart, Vt2\Vt3 58, Vt2-Vt3 55; 3rd ventral setae 13 long, Vt3-Vt3 19 apart; accessory setae absent.

**Coverflap:** 22 wide, 15 long, with about 16 longitudinal lines in 2 rows, genital setae 8 long, Gt-Gt 13 apart.

**Male:** not seen.

**Type data:** **Holotype**, ♀, Hainan: Lingshui County, 22-Sept.-2000, K. W. Huang; ex *Symplocos cochichinensis* Benth. (Symploaceae). (deposited at NMNS).

**Paratypes**, 2 ♀, with same data same as for holotype.

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

**Note:** This new species resembles *C. caliquerci* (Keifer, 1944), but differs in the 2nd transverse being line V-shaped and the 4-rayed empodium.

**Etymology:** The specific designation is derived from the type locality Hainan Province.

#### **Colomerini Newkirk & Keifer, 1975**

Colomerini Newkirk & Keifer, 1975b: 570

Type genus: *Colomerus* Newkirk & Keifer, 1971

*Indosetacus levis* sp. sp. nov. (Fig. 10)

**Female:** Body worm-like, 143 long; shield 40 long, 52 wide, anterior lobe

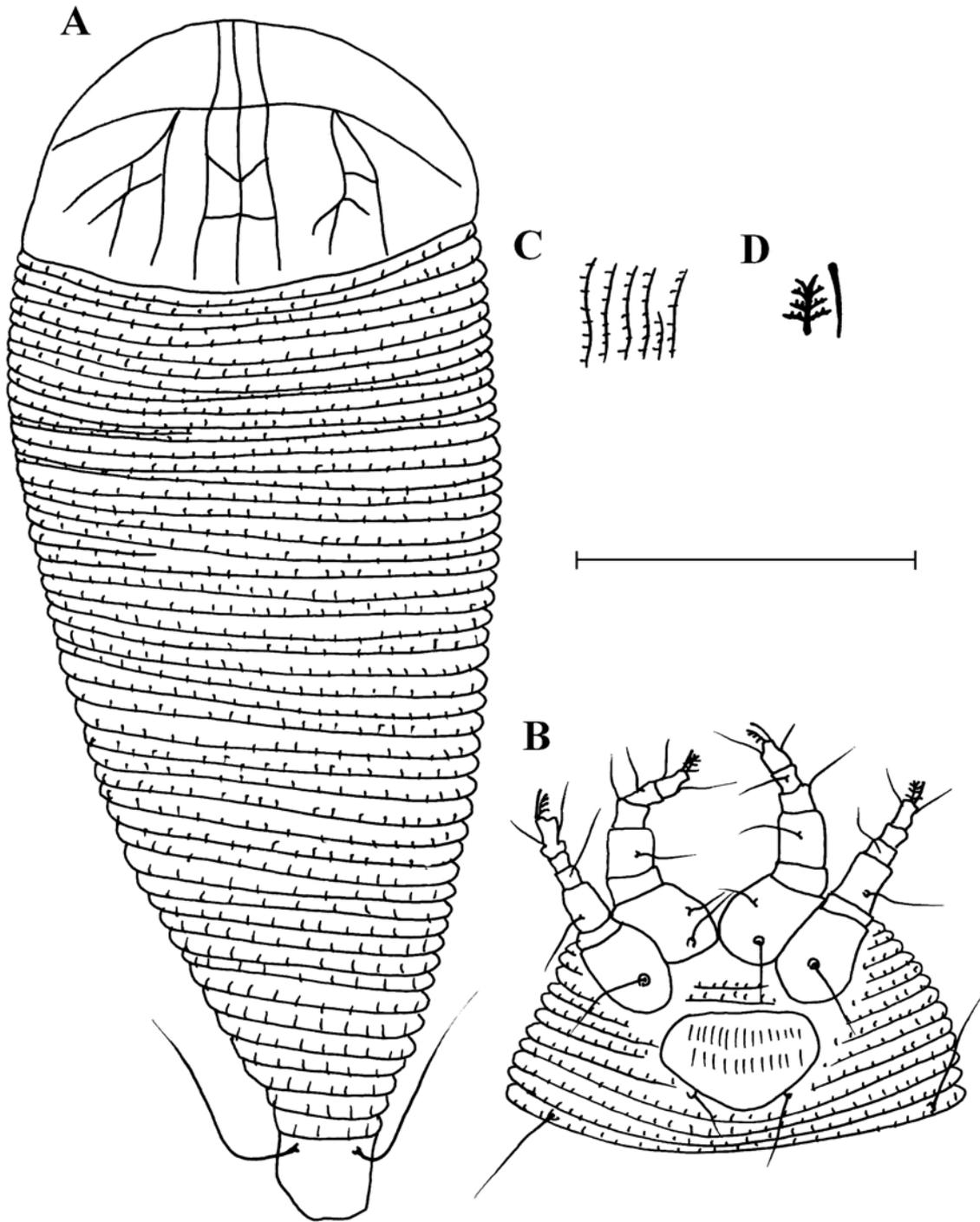


Fig. 9. *Cecidophyes hainani* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$  m; C = 40  $\mu$  m; D = 15  $\mu$  m)

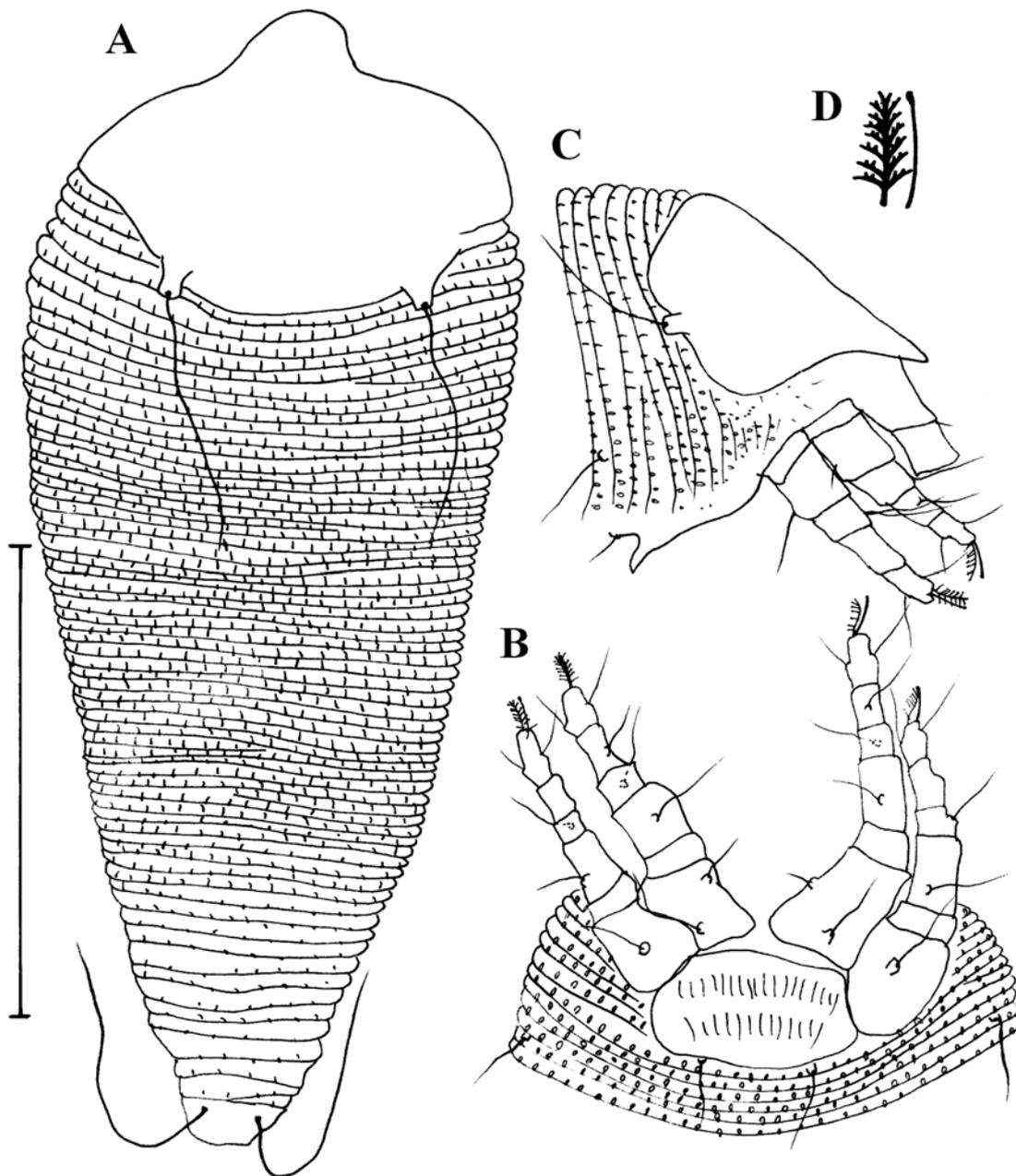


Fig. 10. *Indosetacus levis* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

present; shield design smooth; scapular tubercles set on shield rear margin, setae 34 long, directed to rear, Dt-Dt 31 apart; leg segments normal, fore

tibial setae at basal 1/4, 4 long; coxal area smooth, 1st coxal setae 5 long, Ct1-Ct1 13 apart, 2nd coxal setae 9 long, Ct2-Ct2 16 apart, 3rd coxal

setae 12 long, Ct3-Ct3 31 apart, Ct1\Ct2 16, Ct1-Ct2 7, Ct2\Ct3 24, Ct2-Ct3 8; genitalia appended to coxae; claw ending as knob; empodium simple, 7-rayed.

Opisthosoma: arched, with about 67 microtuberculate rings, 1st 3 rings 5 long; lateral setae 9 long, Lt-Lt 55 apart, Lt\Vt1 49, Lt-Vt1 20; 1st ventral setae 23 long, Vt1-Vt1 36 apart, Vt1\Vt2 34, Vt1-Vt2 19; 2nd ventral setae 10 long, Vt2-Vt2 23 apart, Vt2\Vt3 56, Vt2-Vt3 52; 3rd ventral setae 17 long, Vt3-Vt3 17 apart; accessory setae absent.

Coverflap: 23 wide, 15 long, with about 17 longitudinal lines in 2 rows, genital setae 10 long, Gt-Gt 9 apart.

**Male:** not seen.

**Type data:** **Holotype**, ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex. *Lindera* sp. (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 similar to *I. roxburghianus* Huang, 2004 but differs in the shield lobe being present, the coverflap being about 17 longitudinal lines in 2 rows, and in the 7-rayed empodium.

**Etymology:** This new name means "smooth" in reference to the smooth prodorsal shield design.

### Phyllocoptinae Nalepa, 1892

Phyllocoptinae Nalepa, 1892: 525

Type genus: *Phyllocoptes* Nalepa, 1887

### Key to species of Phyllocoptinae of Hainan

1. Empodium divided.....**Acaricalini**.....  
Opisthosoma with 5 wax-bearing ridges; prodorsal shield with long prominent scapular setae directed posterolaterally, borne on large cylindrical tubercles;

genus II setae present, tibial setae absent.....  
*Notacaphylla chinensiae* Mohanasundaram & Singh, 1988

- Empodium entire..... 2
2. Opisthosoma, viewed dorsally, with lateral lobes or pointed projections from some or all annuli, or with a plate behind shield bearing lateral extensions.....**Tegonotini** ..... 3
- Opisthosoma, viewed dorsally, with annuli evenly downcurved over lateral opisthosomal margins; dorsum varying from evenly arched in cross-section to flattened, ridged, or furrowed..... 4
3. Scapular setae ahead of rear shield margin, direction variable .....  
..... *Tegonotus caryophyllatus* sp. nov.
- Scapular setae on rear shield margin, directed posteriorly .....  
..... *Shevtchenkella sindorae* sp. nov.
4. Scapular setae usually with well-formed, often plicate, tubercles placed ahead of rear shield margin, directing setae forward, upward, or centrad; if tubercles and setae near rear shield margin, then alignment of their bases is longitudinal or diagonal to body.....  
**Phyllocoptini**...Middorsal ridge ending in a broad furrow before termination of subdorsal ridges .....  
..... *Calepitrimerus linderaus* sp. nov.
- Scapular setae with tubercles on or very near rear shield margin, directing setae to rear, usually divergently; scapular tubercles either subcylindrical, or the alignment of their bases transverse to body....**Anthocoptini**.... 5
6. Opisthosoma with middorsal longitudinal furrow; prodorsal shield lobe broad and rounded, anteriorly with 2 distinct spines projecting forward .....  
..... *Tetraspinus litchi* sp. nov.
- Opisthosoma with middorsal longitudinal ridge ..... 7
7. Opisthosoma with 3 ridges .....  
..... *Abacarus euphoriae* Keifer, 1975
- Opisthosoma with 1 ridge .....  
..... *Thamnacus burmanus* sp. nov.

**Acaricalini Amrine & Stasny, 1994**  
Acaricalini Amrine & Stasny, 1994: 767  
Type genus: *Acaricalus* Keifer, 1940

***Notacaphylla chinensiae* Mohanasundaram & Singh, 1988**

*Notacaphylla chinensiae* Mohanasundaram & Singh, 1988: 260

*Aspina litchi* Huang *et al.*, 1989: 59

*Disella litchii* Kuang & Feng, 1990: 172

*Abacarus litchi* Boczek, 1996: 74

**Specimens examined:** 3 ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex. *Dimocarpus longan* (Sapindaceae). 5 ♀, Hainan: Tanchou City, 24-Sept.-2000, K. W. Huang; ex *Litchi chinensis* (Sapindaceae).

**Relation to host:** Erineum on lower surface of leaf.

**Distribution:** Taiwan, China, India, and Thailand.

**Note:** When rechecking the drawings of the 4 species of *Notacaphylla chinensiae* Mohanasundaram & Singh 1988, *Acaspina litchii* Huang *et al.* 1989, *Disella litchii* Kuang & Feng 1990, and *Abacarus litchi* Boczek 1996, we discovered that they appear to be the same species. The prodorsal shield pattern, dorsal ridges on the opisthosoma, scorings on the female genitalia coverflap, and coxal setae pattern are the same. There may be errors in the observation of the leg structure and empodium.

**Tegonotini Bagdasarian, 1978**

Tegonotini Bagdasarian, 1978: 937

Section III Newkirk & Keifer, 1975b: 576

Type genus: *Tegonotus* Nalepa, 1890

***Tegonotus caryophyllatus* sp. nov.** (Fig. 11)

**Female:** Body fusiform, 138 long, shield 43 long, 58 wide, shield lobe present, shield design without median line, admedian lines complete, connected

at base, submedian line absent; scapular tubercles set ahead of rear shield margin, setae 4 long, directed upward and outward, Dt-Dt 20 apart, Dt-Sr 14; leg segments normal, fore tibial setae set in middle, 7 long; coxal area smooth; 1st coxal setae 3 long, Ct1-Ct1 11 apart, 2nd coxal setae 6 long, Ct2-Ct2 7 apart, 3rd coxal setae 8 long, Ct3-Ct3 21 apart, Ct1\Ct2 11, Ct1-Ct2 6, Ct2\Ct3 14, Ct2-Ct3 7; claw ending as knob; empodium simple, 6-rayed.

**Opisthosoma:** flattened, dorsal annuli with about 25 rings, laterally with alternately projecting lobes, 1st 3 dorsal annuli 13 long; ventral annuli with about 52 microtubercles rings; lateral setae 15 long, Lt-Lt 39 apart, Lt\Vt1 34, Lt-Vt1 19; 1st ventral setae 14 long, Vt1-Vt1 21 apart, Vt1\Vt2 25, Vt1-Vt2 21; 2nd ventral setae 7 long, Vt2-Vt2 11 apart, Vt2\Vt3 28, Vt2-Vt3 25; 3rd ventral setae 16 long, Vt3-Vt3 17 apart; accessory setae absent.

**Coverflap:** 17 wide, 10 long, with about 9 longitudinal ridges, genital setae 4 long, Gt-Gt 13 apart.

**Male:** not seen.

**Type data: Holotype:** ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex. *Eugenia caryophyllata* (Myrtaceae). (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 *T. celtis* Kuang *et Zhou*, 1989, but differs in the flattened dorsal opisthosoma and the 6-rayed empodium.

***Shevtchenkella sindorae* sp. nov.** (Fig. 12)

**Female:** Body fusiform, 135 long, shield 43 long, 45 wide, shield lobe present, shield design smooth; scapular tubercles on rear shield margin, setae 5 long, directed to rear, Dt-Dt 26 apart; leg

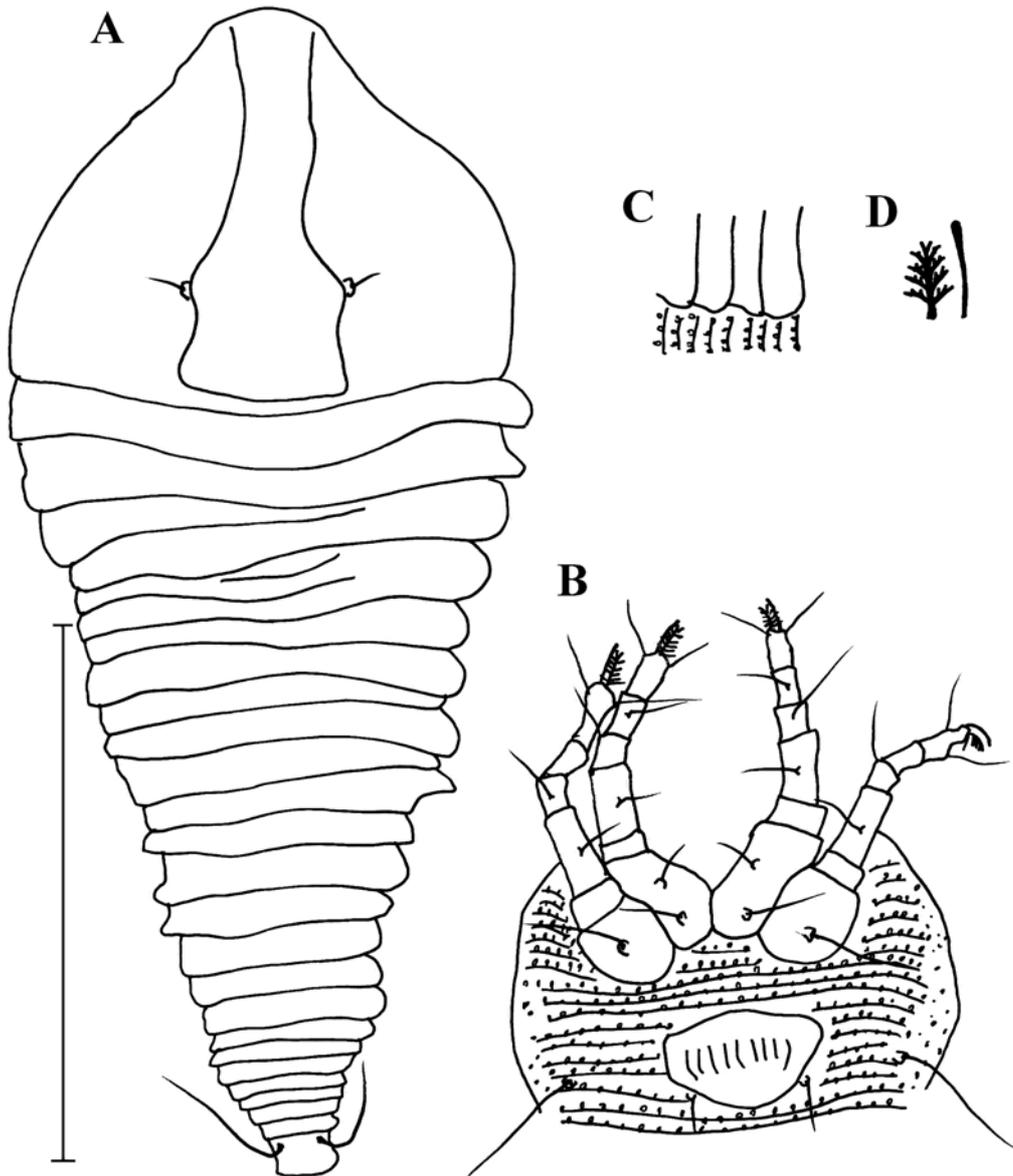


Fig. 11. *Tegenotus caryophyllatus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

segments normal, fore tibial setae set in middle, 6 long; coxal area smooth; 1st coxal setae 7 long, Ct1-Ct1 9 apart, 2nd coxal setae 9 long, Ct2-Ct2 8 apart, 3rd coxal setae 16 long,

Ct3-Ct3 22 apart, Ct1\Ct2 12, Ct1-Ct2 8, Ct2\Ct3 15, Ct2-Ct3 7; claw ending as knob; empodium simple, 5-rayed.

Opisthosoma: with furrow at anterior

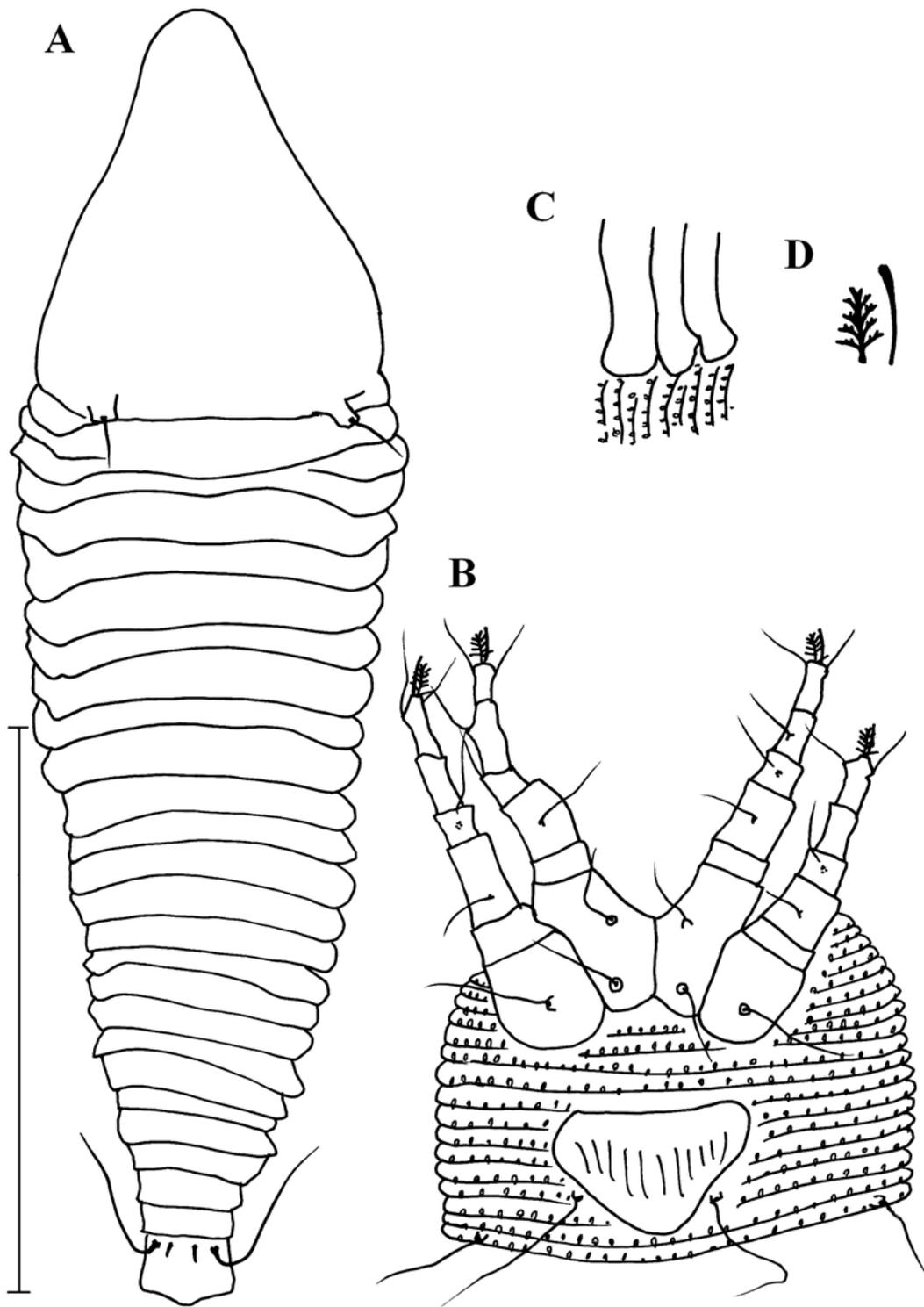


Fig. 12. *Shevtchenkella sindorae* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$  m; C = 40  $\mu$  m; D = 15  $\mu$  m)

part, dorsal annuli with about 27 rings, 1st 3 dorsal annuli 15 long, ventral annuli with about 48 microtuberculate rings; lateral setae 11 long, Lt-Lt 49 apart, Lt\Vt1 49, Lt-Vt1 25, 1st ventral setae 5 long, Vt1-Vt1 38 apart, Vt1\Vt2 36, Vt1-Vt2 26; 2nd ventral setae 9 long, Vt2-Vt2 16 apart, Vt2\Vt3 38, Vt2-Vt3 36; 3rd ventral setae 12 long, Vt3-Vt3 12 apart; accessory setae present.

Coverflap: 20 wide, 13 long, with about 11 longitudinal ridges, genital setae 35 long, Gt-Gt 15 apart.

**Male:** not seen.

**Type data: Holotype:** ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex. *Sindora cochinchinensis* (Caesaplinaeae). (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 distinguished from other species of *Shevtchenkella* Bagdasarian, 1978 by its prodorsal shield being longer than wide. This new species is close to *S. macrorrhina* Santana & Flechtmann, 2002, but differs in the dorsal opisthosoma having a furrow at the anterior part and the 5-rayed empodium.

#### Phyllocoptini Nalepa, 1892

Phyllocoptini Nalepa, 1892: 525

Criotacini Bagdsarian, 1975: 307

Section IV Newkirk & Keifer, 1975: 576

Type genus: *Phyllocoptes* Nalepa, 1887

*Calepitrimerus linderaus* sp. nov. (Fig. 13)

**Female:** Body fusiform-shaped, 155 long, shield 36 long, 51 wide, shield lobe present, shield design with discontinuous median line, from base to basal 1/3, Y-shaped and from basal 4/5 to apex, respectively, admedian lines complete, with transverse lines at 1/2 and basal 4/5, forming a hexagon-like

pattern, 3 submedian lines, with transverse lines connected to admedian lines; scapular tubercles set ahead of rear shield margin, setae 5 long, directed centrad and upward, Dt-Dt 17 apart, Dt-Sr 8; leg segments normal, tibial setae 4 long, set in middle; coxal area smooth; 1st coxal setae 7 long, Ct1-Ct1 10 apart, 2nd coxal setae 7 long, Ct2-Ct2 8 apart, 3rd coxal setae 16 long, Ct3-Ct3 22 apart, Ct1\Ct2 11, Ct1-Ct2 5, Ct2\Ct3 15, Ct2-Ct3 7; claw ending as knob; empodium simple, swollen, 5-rayed.

**Opisthosoma:** dorsum with median ridges ending before submedian ridges, dorsal annuli with about 46 rings, 1st 3 dorsal annuli 5 long, ventral annuli with about 52 microtuberculate rings; lateral setae 17 long, Lt-Lt 38 apart, Lt\Vt1 37, Lt-Vt1 22; 1st ventral setae 18 long, Vt1-Vt1 23 apart, Vt1\Vt2 31, Vt1-Vt2 27; 2nd ventral setae 13 long, Vt2-Vt2 12 apart, Vt2\Vt3 34, Vt2-Vt3 30; 3rd ventral setae 11 long, Vt3-Vt3 17 apart; accessory setae present.

Coverflap: 20 wide, 11 long, with about 14 longitudinal ridges, genital setae 9 long, Gt-Gt 11 apart.

**Male:** Body 140 long, shield 49 long, 53 wide, scapular setae 4 long, Dt-Dt 19 apart; genitalia 14 wide, 2 long, setae 11 long, Gt-Gt 11 apart.

**Type data: Holotype:** ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex. *Lindera* sp. (Lauraceae). (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 *C. anatis* Keifer 1940 but differs in the shield design having 2 transverse lines between the admedian lines and the swollen 5-rayed empodium.

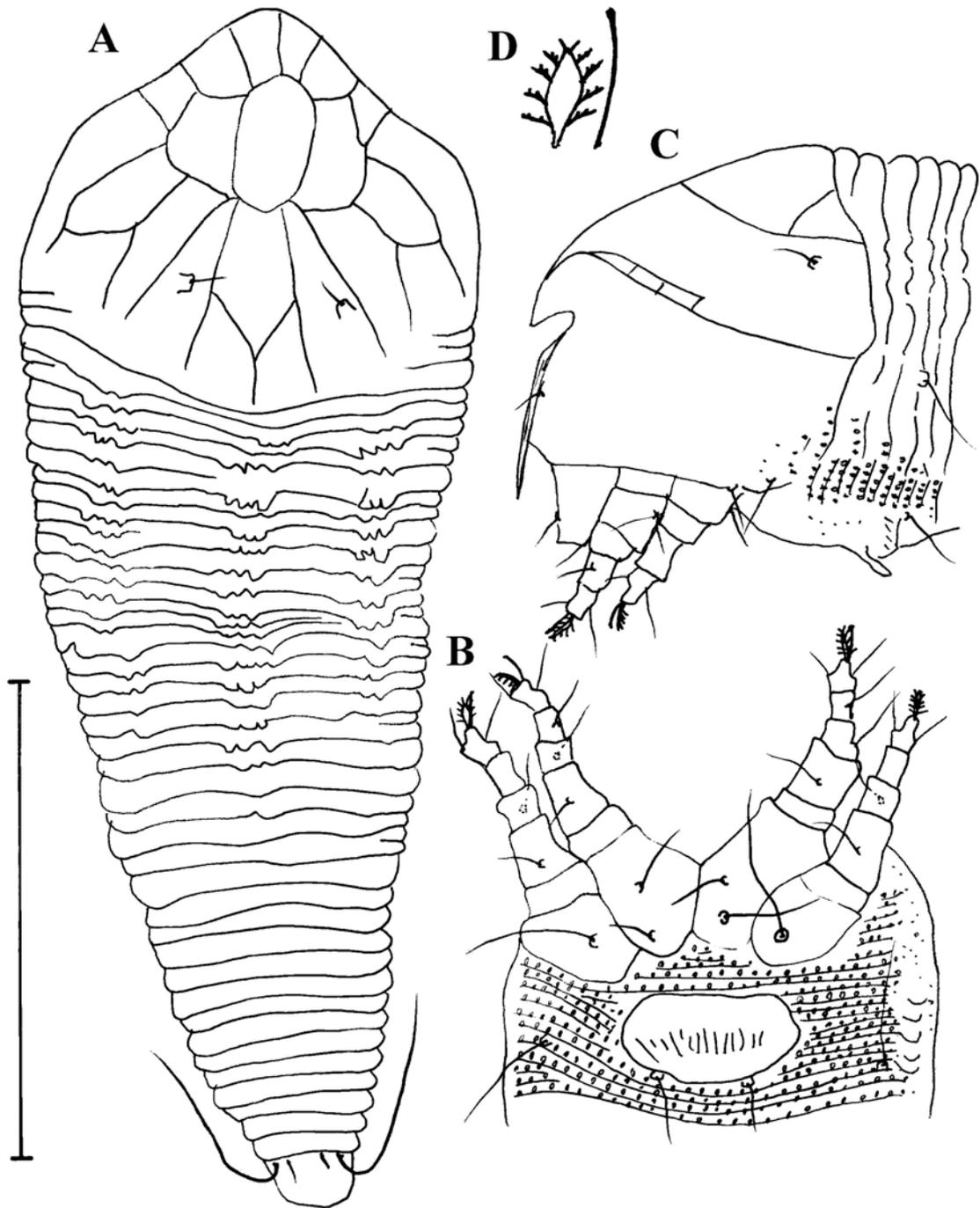


Fig. 13. *Calepitrimerus linderanus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, anterior area in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

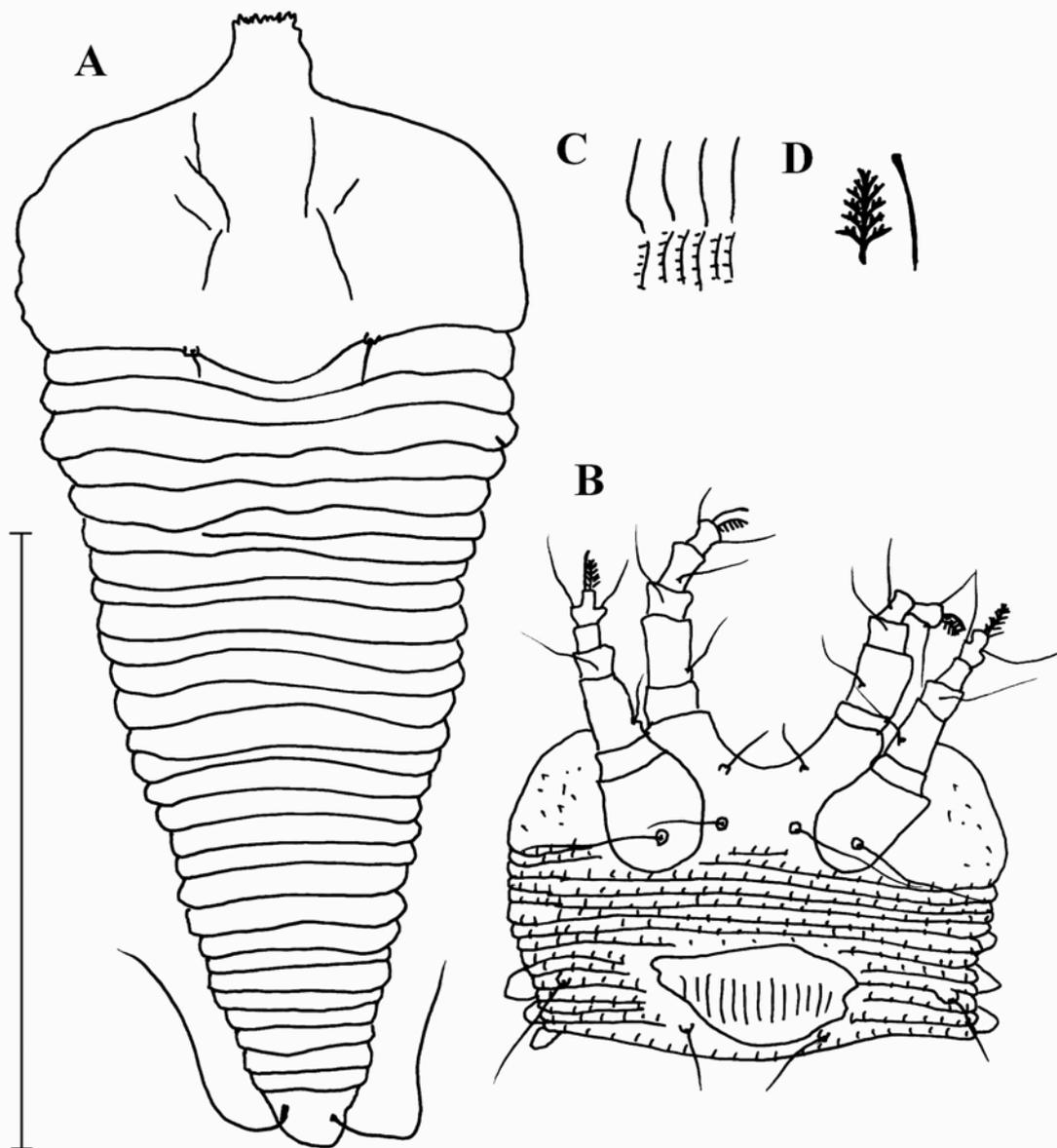


Fig. 14. *Tetraspinus litchi* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

**Anthocoptini Amrine & Stasny, 1994**  
 Anthocoptini Amrine & Stasny, 1994: 771  
 Section V Newkirk & Keifer, 1975: 576  
 Type genus: *Anthocoptes* Nalepa, 1892

*Tetraspinus litchi* sp. nov. (Fig. 14)

**Female:** Body fusiform, 128 long, shield 41 long, 50 wide, shield lobe larger, anteriorly with several projecting spines, shield design lacking median line, admedian lines from basal 1/5 to basal 4/5, diverging anteriorly and

posteriorly, submedian line absent; scapular tubercles set on rear shield margin, setae 5 long, directed to rear, Dt-Dt 20 apart; leg segments normal, fore tibial setae set in middle, 3 long; coxal area smooth; 1st coxal setae 6 long, Ct1-Ct1 9 apart, 2nd coxal setae 9 long, Ct2-Ct2 8 apart, 3rd coxal setae 16 long, Ct3-Ct3 21 apart, Ct1\Ct2 11, Ct1-Ct2 7, Ct2\Ct3 15, Ct2-Ct3 7; claw ending as knob; empodium simple, 6-rayed.

Opisthosoma: dorsum with wide median furrow, dorsal annuli with about 29 rings, 1st 3 dorsal annuli 8 long, ventral annuli with about 42 microtuberculate rings; lateral setae 10 long, Lt-Lt 44 apart, Lt\Vt1 39, Lt-Vt1 21; 1st ventral setae 12 long, Vt1-Vt1 25 apart, Vt1\Vt2 28, Vt1-Vt2 21; 2nd ventral setae 5 long, Vt2-Vt2 12 apart, Vt2\Vt3 32, Vt2-Vt3 29; 3rd ventral setae 18 long, Vt3-Vt3 17 apart; accessory setae absent.

Coverflap: 22 wide, 11 long, with about 13 longitudinal ridges, genital setae 9 long, Gt-Gt 15 apart.

**Male:** not seen.

**Type data:** **Holotype:** ♀, Hainan: Tanchou City, 24-Sept.-2000, K. W. Huang; ex *Litchi chinensis* (Sapindaceae). (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 *T. lentus* Boczek, 1961, but differs in the prodorsal shield having several spines projecting anteriorly and the 6-rayed empodium.

***Thamnacus burmanus* sp. nov.** (Fig. 15)

**Female:** Body fusiform, 171 long, shield 41 long, 58 wide, shield lobe present, shield design without median line, admedian lines complete, connected at base, diverging to apex, concave at

basal 1/3 and 2/3, with many dashed lines between admedian lines, submedian line connected to admedian lines at 1/2, with several lines at lateral sides; scapular tubercles larger, set on rear shield margin, setae 16 long, directed to rear and divergent, Dt-Dt 29 apart; leg segments normal, fore tibial setae 10 long, set at basal 2/3; coxal area smooth; 1st coxal setae 5 long, Ct1-Ct1 12 apart, 2nd coxal setae 7 long, Ct2-Ct2 12 apart, 3rd coxal setae 15 long, Ct3-Ct3 28 apart, Ct1\Ct2 14, Ct1-Ct2 7, Ct2\Ct3 20, Ct2-Ct3 9; claw ending as knob; empodium simple, 6-rayed.

Opisthosoma: dorsum with wide median ridge, dorsal annuli with about 39 rings, 1st 3 dorsal annuli 9 long, ventral annuli with about 54 microtuberculate rings; lateral setae 16 long, Lt-Lt 44 apart, Lt\Vt1 44, Lt-Vt1 23; 1st ventral setae 24 long, Vt1-Vt1 30 apart, Vt1\Vt2 39, Vt1-Vt2 32; 2nd ventral setae 18 long, Vt2-Vt2 18 apart, Vt2\Vt3 49, Vt2-Vt3 46; 3rd ventral setae 14 long, Vt3-Vt3 15 apart; accessory setae absent.

Coverflap: 21 wide, 11 long, with about 11 longitudinal ridges, genital setae 9 long, Gt-Gt 14 apart.

**Male:** Body 173 long, shield 41 long, 52 wide, scapular setae 27 long, Dt-Dt 27 apart; genitalia 17 wide, 6 long, setae 9 long, Gt-Gt 16 apart.

**Type data:** **Holotype** ♀, Hainan: Changchiang County, 20-Sept.-2000, K. W. Huang; ex *Cinnamomum burmanni* (Lauraceae). (deposited at NMNS). **Paratypes**, 4 ♀, 2 ♂, data same as for holotype; 2 ♀, 1 ♂, Hainan: Chenchiang County, 21-Sept.-2000, K. W. Huang; ex *Cryptocarya chinensis* (Lauraceae).

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

**Note:** This new species differs from other

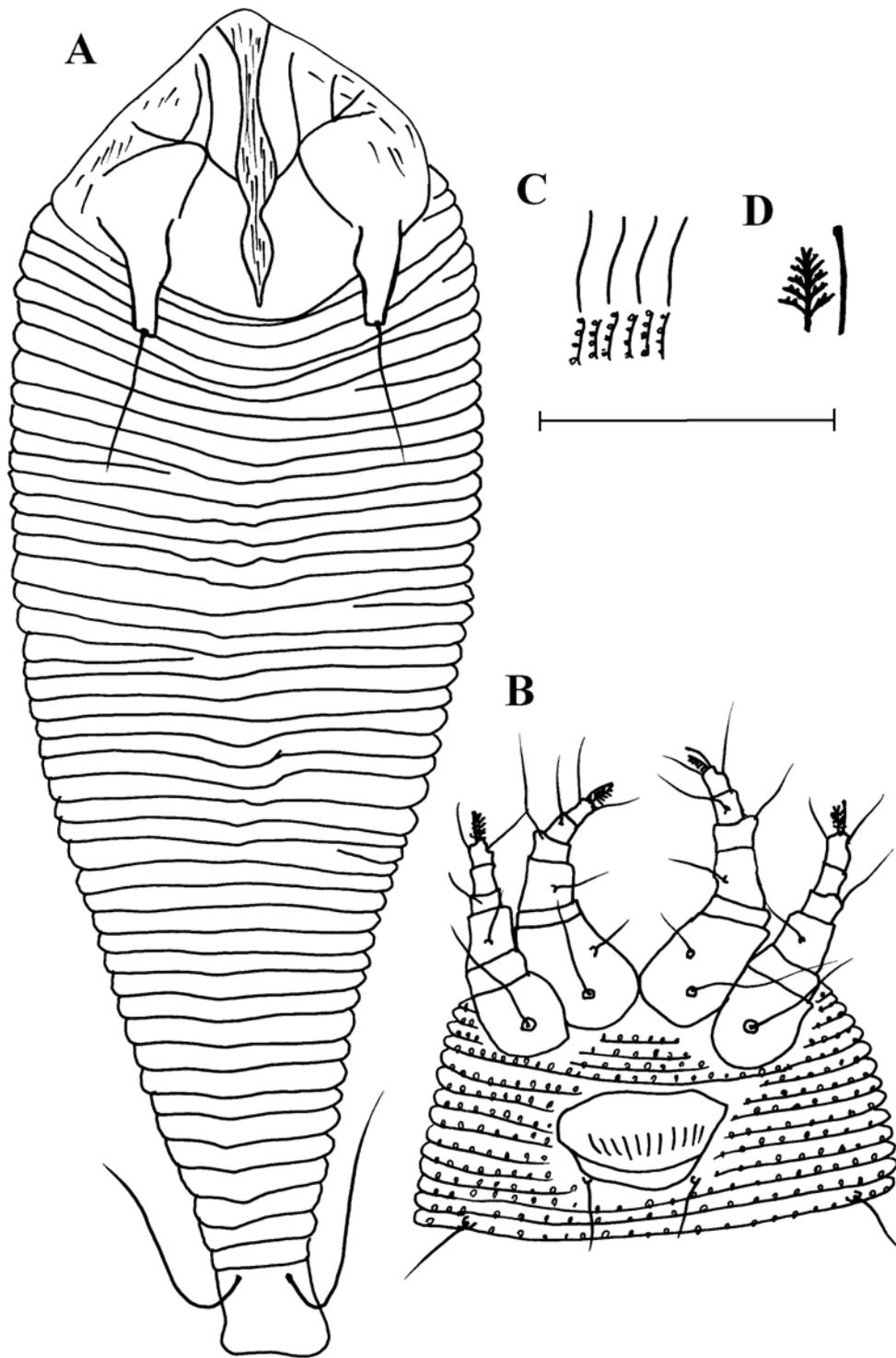


Fig. 15. *Thamnacus burmanus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$  m; C = 40  $\mu$  m; D = 15  $\mu$  m)

species of *Thamnacus* Keifer, 1944 by the prodorsal shield design having many dashed lines between the admedian lines.

***Abacarus euphoriae* Keifer, 1975**

*Abacarus euphoriae* Keifer, 1975

**Specimens examined:** 3 ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex. *Dimocarpus longan* (Sapindaceae).

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

**Distribution:** China, Australia, and Thailand.

**Diptilomiopinae Keifer, 1944**

Diptilomiopinae Keifer, 1944: 30

Type genus: *Diptilomiopus* Nalepa, 1916

***Diptilomiopus lobbianus* sp. nov.** (Fig. 16)

**Female:** Body fusiform, 153 long, shield 25 long, 60 wide, shield lobe present, shield design with a network of cells, with a tier of 12 cells along anterolateral shield margin, 5 cells occurring in middle, 2 open cells on rear of shield; scapular tubercles and setae absent; leg segment genua absent from both legs, fore tibial and fore and hind femoral setae absent; coxal area smooth; 1st coxal tubercle and setae absent, 2nd coxal setae 25 long, Ct2-Ct2 10 apart, 3rd coxal setae 33 long, Ct3-Ct3 31 apart, Ct2\Ct3 21, Ct2-Ct3 11; claw ending as knob; empodium divided, 4-rayed. Opisthosoma: dorsum arched, dorsal annuli with about 57 smooth rings, 1st 3 dorsal annuli 9 long; ventral annuli with about 58 microtuberculate rings; lateral tubercle and setae absent, 1st ventral setae 13 long, Vt1-Vt1 38 apart; Vt1\Vt2 36, Vt1-Vt2 27; 2nd ventral setae 6 long; Vt2-Vt2 17 apart, Vt2\Vt3 44, Vt2-Vt3 40; 3rd ventral setae 26 long, Vt3-Vt3 19 apart; accessory setae

absent.

Coverflap: 27 wide, 18 long, smooth, genital setae 7 long, Gt-Gt 22 apart.

**Male:** not seen.

**Type data: Holotype:** ♀, Hainan: Tanchou City, 19-Sept.-2000, K. W. Huang; ex. *Gonocaryum lobbianum* (Lcacinaceae). (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 *D. cuminis* Chakrabarti et al., 1992 but differs in the prodorsal shield design having 2 open cells on the rear of the shield and by the 4-rayed empodium.

**Rhyncaphytopinae Roivainen, 1953**

Rhyncaphytopinae Roivainen, 1953: 86

Type genus *Rhyncaphytopus* Keifer, 1939

***Asetaecus triangulus* sp. nov.** (Fig. 17)

**Female:** Body fusiform, 138 long, shield 26 long, 55 wide, shield lobe present, triangular, shield design with granules at anterior and lateral margins, median line absent, admedian lines from base to 1/2; scapular tubercles set on admedian lines, ahead of rear shield margin, setae absent; leg segments normal, femoral setae absent, fore tibial setae 6 long, setae set at basal 2/3; coxal area with granules; 1st coxal setae 17 long, Ct1-Ct1 12 apart, 2nd coxal setae 17 long, Ct2-Ct2 12 apart, 3rd coxal setae 27 long, Ct3-Ct3 27 apart, Ct1\Ct2 15, Ct1-Ct2 9, Ct2\Ct3 19, Ct2-Ct3 7; claw ending as knob; empodium simple, 6-rayed.

Opisthosoma: dorsal ridges faint, dorsal annuli with about 89 microtuberculate rings, 1st 3 dorsal annuli 6 long, ventral annuli with 90 microtuberculate rings; lateral setae 12 long, Lt-Lt 45 apart, Lt\Vt1 49, Lt-Vt1 24; 1st ventral setae 14 long, Vt1-Vt1 31

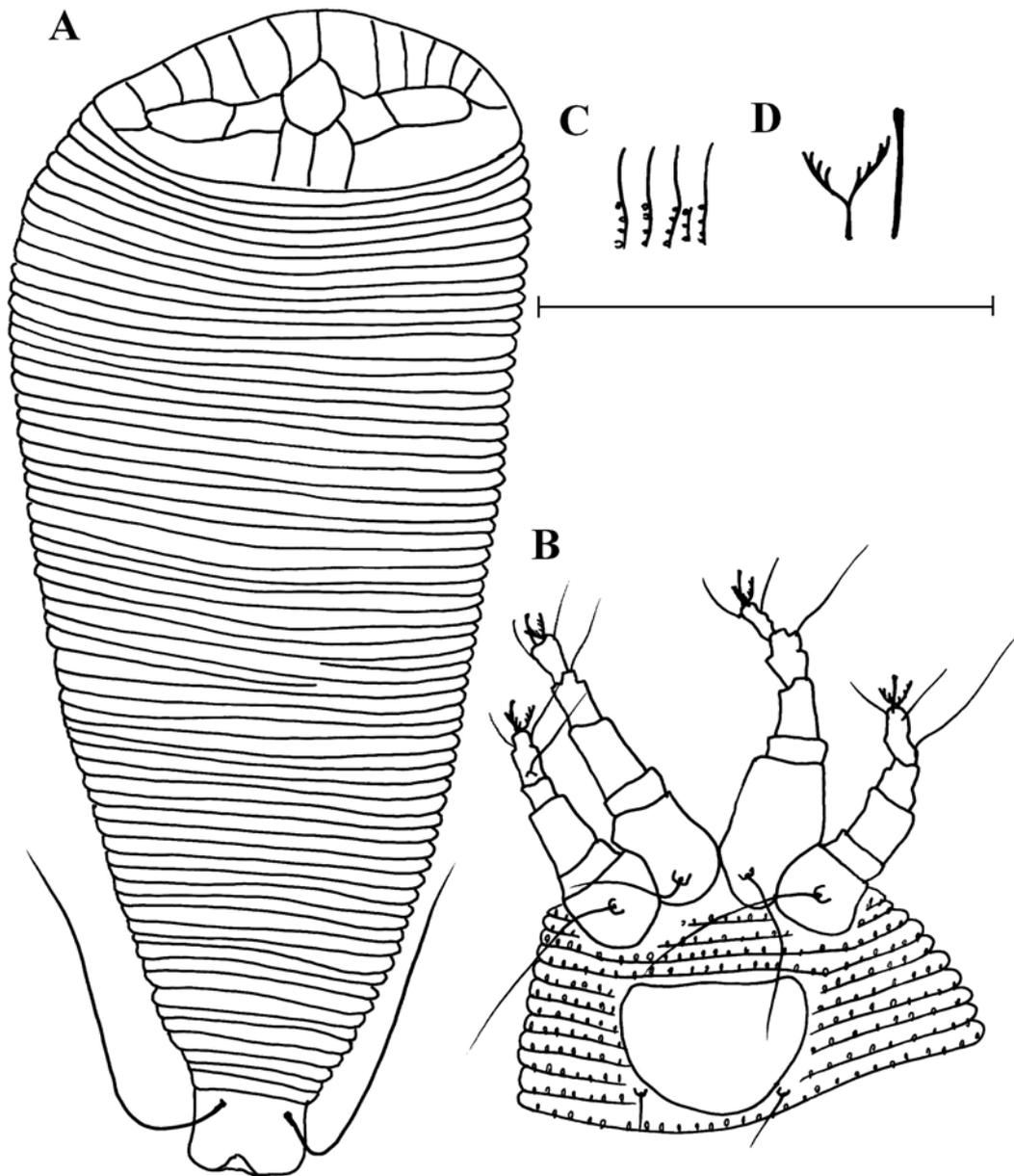


Fig. 16. *Diptilomiopus lobbianus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$  m; C = 40  $\mu$  m; D = 15  $\mu$  m)

apart, Vt1\Vt2 36, Vt1-Vt2 27; 2nd ventral setae 13 long, Vt2-Vt2 21 apart, Vt2\Vt3 41, Vt2-Vt3 32; 3rd ventral setae 26 long, Vt3-Vt3 30

apart; accessory setae absent. Coverflap: 29 wide, 17 long, with about 11 longitudinal ridges at base, genital setae 6 long, Gt-Gt 21 apart.

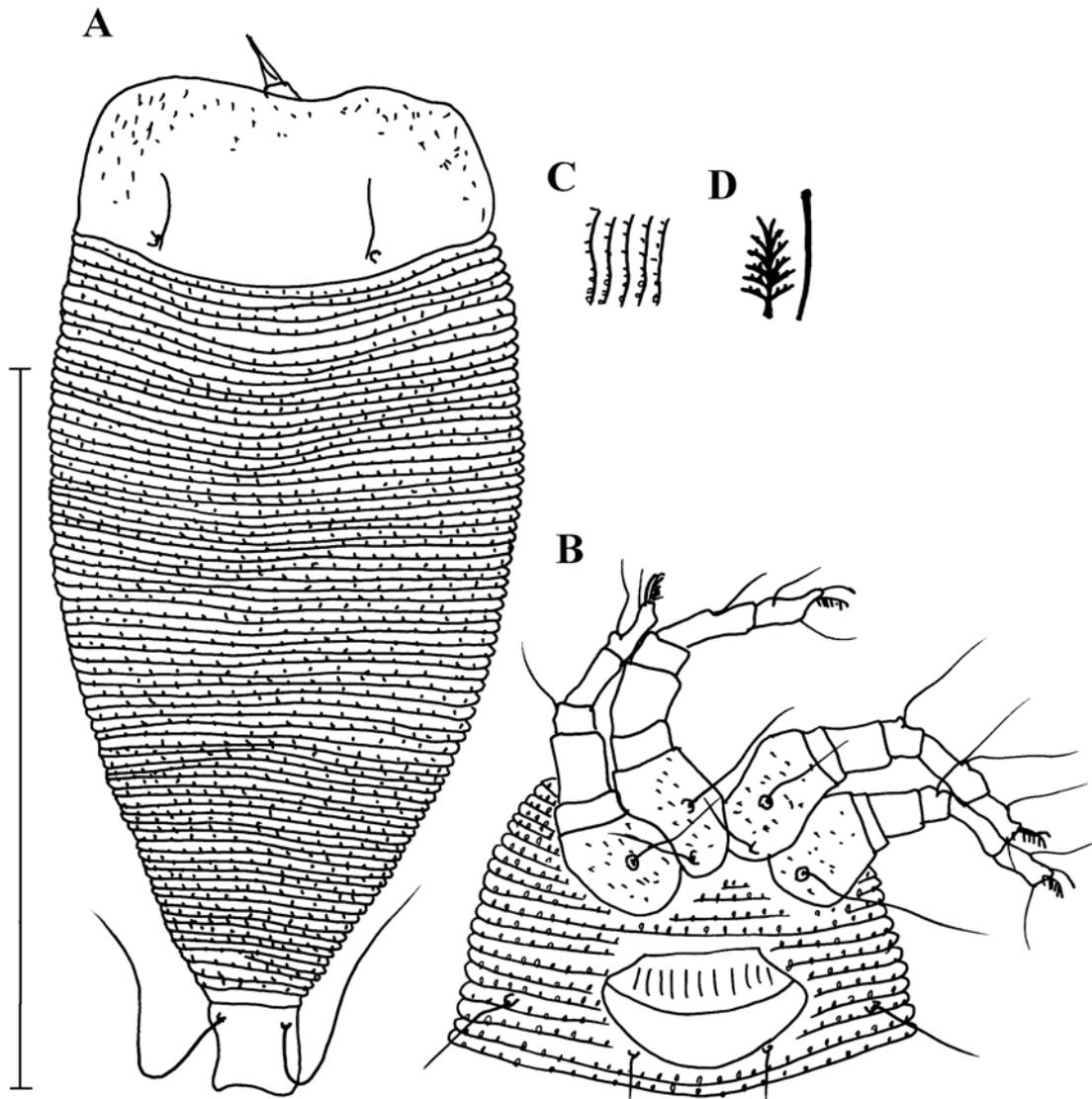


Fig. 17. *Asetacus triangulus* sp. nov. (♀). A, Dorsal view; B, legs and genital region, ventral view; C, detail of some annuli in lateral view; D, empodium and solenidion. (scale A, B = 50  $\mu$ m; C = 40  $\mu$ m; D = 15  $\mu$ m)

**Male:** not seen.

**Type data:** **Holotype**, ♀, Hainan: Lingshui County, 22-Sept.-2000, K. W. Huang; ex *Symplocos cochichinensis* Benth. (Symplloaceae). (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 differs from other species of *Asetacus* Keifer, 1952, by the prodorsal shield design lacking a mediana line and in having granules at the anterior and lateral margins.

**Etymology:** This new name means “triangular”

in reference to the triangular-shaped shield lobe.

## References

- Amrine, W. J. Jr. and T. Stasny.** 1994. Catalog of the Eriophyoidea of the world. Indira Publ. House; West Bloomfield, MI. 798 pp.
- Bagdasarian, A. T.** 1978. A new genus of mites of the Eriophyoidea. Zool. Zhur. 57: 936-939.
- Boczek, J.** 1961. Studies on eriophyid mites of Poland II. Acarologia, 3: 560-570.
- Boczek, J., and G. Nuzzaci.** 1988. A new genus and five new species of eriophyid mites. Entomolog. Bari 23: 123-138.
- Chakrabarti, S., B. Ghosh, and B. Das.** 1992. New genera and species of Rhyncaphytoptidae (Eriophyoidea) with key to subfamilies and genera. Acarologia 33: 75-84.
- Chandrapatya, A., and J. Boczek.** 1996. Studies on Eriophyoid mites. XIX. Bull. Polish Acad. Sci. Biol. Sci. 44: 71-81.
- Flechtmann, C. H. W.** 2001. *Aberoptus cerostructor* n. sp., a deutergynous species from Brazil. Int. J. Acarol. 27: 199-204.
- Huang, K. W.** 1999. The species and geographic variation of eriophyoid mites on *Yushania niitakayamensis* of Taiwan. pp. 199-208. In: M. M. Yang ed. Proceedings of the Symposium on Insect Systematics and Evolution. Department of Entomology, National Taiwan University, and Taiwan Museum, Taipei, Taiwan. (in Chinese)
- Huang, K. W.** 2001a. The eriophyoid mites of Taiwan: description of twenty-three species from Lanyu. Bull. Natl. Mus. Nat. Sci. 13: 37-63.
- Huang, K. W.** 2001b. Eriophyoid mites of Taiwan: description of eighty-six species from Tengchih area. Bull. Natl. Mus. Nat. Sci. 14: 1-84.
- Huang, K. W., and C. F. Wang.** 2003. Eriophyoid mites of Taiwan: description of thirteen species of Nothopodinae from Hueysuen. Formosan Entomol. 23: 313-329.
- Huang, K. W., and C. F. Wang.** 2004. Eriophyoid mites of Taiwan: description of nine species of Cecidophyinae and Eriophyinae from Hueysuen. Plant Prot. Bull. 46: 55-68.
- Huang, T., K. W. Huang, and I. J. Horng.** 1990. Two species of eriophyid mites injurious to litchi trees in Taiwan. Chinese J. Entomol. Special Publ. 3: 57-64.
- Keifer H. H.** 1940. Eriophyid Studies VIII. Bull. CA. Dept. Agric. 29: 21-46.
- Keifer, H. H.** 1944. Eriophyid studies XIV. Bull. CA. Dept. Agric. 33: 18-38.
- Keifer, H. H.** 1952. Eriophyid Studies XVIII. Bull. CA. Dept. Agric. 41: 31-42.
- Keifer, H. H.** 1956. Eriophyid Studies XXIV. Bull. CA. Dept. Agric. 45: 159-164.
- Keifer, H. H.** 1959. Eriophyid studies XXVIII. Occasional Papers No. 2, CA. Dept. Agric. 2: 1-20.
- Keifer, H. H.** 1966. Eriophyid studies. B-21. Bur. Entomol., CA. Dept. Agric. 24 pp.
- Keifer, H. H.** 1975a. Eriophyid studies C-11. ARS-USDA: 1-24.
- Keifer, H. H.** 1975b. Eriophyoidea Nalepa. pp. 327-533. In: L. R. Jeppson, H. H. Keifer and E. W. Baker eds. Mites injurious to economic plants. Univ. of California Press, Berkeley, CA.
- Kuang, H. Y., and Y. B. Feng.** 1990. Three new species of Nothopodinae from China (Acari: Eriophyidae). Acta Zool. Sin. 15: 169-173.
- Kuang, H. Y. and W. X. Zhuo.** 1989. Description of a new genus and seven new species of Phyllocoptinae from China. Acta Entomol. Sin. 32: 113-121.
- Lindquist, E. E.** 1996. External anatomy and notation of structures. pp. 3-31.

- In:* E. E. Lindquist, M. W. Sabelis and J. Bruin eds. World crop pests. Vol. 6, Eriophyid mites – their biology, natural enemies and control. Elsevier Science, Amsterdam, The Netherlands.
- Mohanasundaram, M.** 1984. New eriophyoid mites from India. *Oriental Insects* 18: 251-283.
- Mohanasundaram, M.** 1986. Three new species of Nothopodinae (Eriophyidae: Acari) from Tamil Nadu. *Entomon* 11: 41-45.
- Mohanasundaram, M., and P. Singh.** 1988. A new genus and species of eriophyid mite from West Bengal (Eriophyidae: Acari). *Entomon* 13: 259-261.
- Nalepa, A.** 1892. Neue Arten der Gattung *Phytoptus* Duj. und *Cecidophyes* Nal. Denkschriften der kaiserlichen Akademie der Wissenschaften. Mathematisch-naturwissenschaftliche Klasse. Wien. 59: 525-540.
- Roivainen, H.** 1953. Subfamilies of European eriophyoid mites. *Annales Entomol. Fennica* 19: 83-87.
- Santan, D. L. Q., and C. H. W. Flechtmann.** 2002. Two new species of *Shevtchenkella* from a Brazilian forest tree. *Int. J. Acarol.* 28: 261-265.
- Received: November 14, 2005**  
**Accepted: December 28, 2005**

# 中國海南省的節蟬（蟬蟬亞綱：節蟬總科）

黃坤煒\* 國立自然科學博物館動物組 台中市館前路1號

程立生 華南熱帶農業大學 中國海南省儋州市寶島新村

## 摘 要

本文描述及繪圖 17 屬、20 種海南島節蟬，其中包含 15 新種及 5 舊有種。分別為：*Aberoptus integritas* sp. nov. 為害油桐 (*Sindora cochinchinensis*), *Apontella succedana* sp. nov. 為害木臘樹 (*Rhus succedanea*), *Anothopoda hainanensis* sp. nov. 為害花椒屬 (*Zanthoxylum* sp.), *Cosella chinensis* sp. nov. 為害細子龍 (*Amesiodendron chinense*), *Cosella symplocoae* sp. nov. 為害鐵鏽葉山礬 (*Symplocos cochinchinensis*), *Cosella fleschneri* (Keifer, 1959) 為害木荷屬 (*Schima* sp.), *Cosella speciosae* sp. nov. 為害大花紫薇 (*Lagerstromemia speciosa*), *Disella hainanensis* sp. nov. 為害荔枝 (*Litchi chinensis*), *Nonthaburinus litchi* Chandrapatya, 1996 為害荔枝 (*L. chinensis*), *Cecidophyes hainani* sp. nov. 為害鐵鏽葉山礬 (*Sym. cochinchinensis*), *Indosetacus levis* sp. nov. 為害釣樟屬 (*Lindera* sp.), *Notacaphylla chinensiae* Mohanasundaram & Singh, 1988 為害荔枝及龍眼 (*L. chinensis* 及 *Dimocarpus longan*), *Tegonotus caryophyllatus* sp. nov. 為害大葉丁香 (*Eugenia caryophyllata*), *Shevtchenkella sindorae* sp. nov. 為害油桐 (*Sin. cochinchinensis*), *Calepitrimerus linderaus* sp. nov. 為害釣樟屬 (*Lindera* sp.), *Abacarus euphoriae* Keifer, 1975 為害龍眼 (*D. longan*), *Tetraspinus litchi* sp. nov. 為害荔枝 (*L. chinensis*), *Thamnacus burmanus* sp. nov. 為害陰香 (*Cinnamomum burmanni*), *Diptilomiopus lobbianus* sp. nov. 為害瓊楠 (*Gonocaryum lobbianum*), 及 *Asetacus triangulus* sp. nov. 為害鐵葉灰木 (*Sym. cochinchinensis*)。本文並對海南產節蟬的科、亞科及種做一檢索表。

關鍵詞：節蟬、新種、海南。