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New species and new records of Tetranychidae (Acarina, Prostigmata) from Thailand

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Abstract

Sampling efforts conducted in several provinces from Thailand disclosed three new species of tetranychid mites. Two of them belong to the genus *Tetranychus*, namely *Tetranychus occultaspina* **sp. nov.** and *Tetranychus truncatissimus* **sp. nov.** and the third species belongs to the genus *Schizotetranychus*, *Schizotetranychus krungthepensis* **sp. nov.** They were collected on *Ipomoea aquatica*, *Bambusa multiplex* and *Saccharum officinarum*, respectively. New records and new hosts are also mentioned.

Key words: Acari, *Schizotetranychus krungthepensis*, *Tetranychus* (*Tetranychus*) *occultaspina*, *Tetranychus* (*Tetranychus*) *truncatissimus*, Thailand

Introduction

The Thailand spider mite fauna was mainly investigated by Baker (1975) and by Ehara & Wongsiri (1975) who reported 32 and 26 species (including nine new species) respectively. A new species from Thailand was also described in each of the contributions by Tangkanasing (1988), Ehara & Masaki (2001) and Flechtmann (2013) and Sakagami *et al*. (2009) mentioned three new records. To date 41 species of Tetranychidae are known from this country (Migeon & Dorkeld 2006–2013).[1]

Among them, nine species are native and only known from this country. In order to increase the knowledge about the spider mite biodiversity from Thailand, mite samples from 12 provinces of Northern, Eastern, North-Eastern and Central parts of Thailand were collected in 2011. Various plants were sampled, including wild plants, cultivated plants, ornamental and perennial plants. In this paper we report the description of three new species of Tetranychidae, one *Schizotetranychus* and two *Tetranychus*, and we also mention new records of spider mites collected in Thailand.

Material and methods

Mites were collected directly from field samples in 70% ethyl alcohol. When collected mites were scarce or when males were lacking, females were allowed to oviposit on a detached leaf. Newly emerged adults were picked up and kept in ethanol. Following clearing in lactic acid (50%) for at least 48 hours they were mounted in Hoyer's medium. The specimens were examined using a Leica DM LB 2 phase contrast microscope and illustrated with the

1. According to Migeon & Dorkeld's database 42 species are known from Thailand. *Oligonychus pratensis* is mentioned but this is an error. Baker (1975) reported an unidentified *Oligonychus* species that belongs to the *pratensis* group but he never found *O. pratensis* in Thailand.

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aid of a drawing tube attachment (*camera lucida*). Measurements were taken using the imaging software Perfect Image® (Clara Vision) coupled with ProgRes® Capture Pro 2.6 software for image acquisition.

The setal nomenclature used in the description follows Lindquist (1985). Leg setal counts are given in the order: coxa, trochanter, femur, genu, tibia and tarsus. Numbers of setae refer to tactile setae, solenidia are given in parentheses and alternative counts are given in brackets. All measurements are given in micrometers and correspond to the holotype followed (in parentheses) by minimum and maximum values from paratypes.

Taxonomy

Subfamily Tetranychinae Berlese, 1913

Tribe Tetranychini Reck, 1950

Genus *Eotetranychus* Oudemans, 1931

Eotetranychus Oudemans, 1831: 224; Pritchard & Baker, 1955: 138. Type-species: *Trombidium tiliarium* Hermann.

Eotetranychus celtis Ehara, 1965

This species was described on *Celtis sinensis* Pers. (Ehara 1965) and later recorded in Thailand on *Morus* sp. (Ehara & Wongsiri 1975) and in China on *Broussonetia papyrifera* (L.) L'Hér. ex Vent (Wang & Ma 1993).

Specimens examined. One female and 3 males on *Aegle marmelos* (L.) Corr. (Rutaceae), Nakhom Pathom province, Thailand, 23/12/2011, Leg. H.H. Naing, A. Chandrapatya, P. Konvipasruang.

Genus *Schizotetranychus* Trägrådh, 1915

Schizotetranychus Trägrådh, 1915: 277; Pritchard & Baker, 1955: 225–227; Wainstein, 1960: 166; Meyer, 1974: 163; Tuttle, Baker & Abbatiello, 1976: 64. Type-species: *Tetranychus schizopus* Zacher.

Schizotetranychus colocasiae Ehara and Tho, 1988

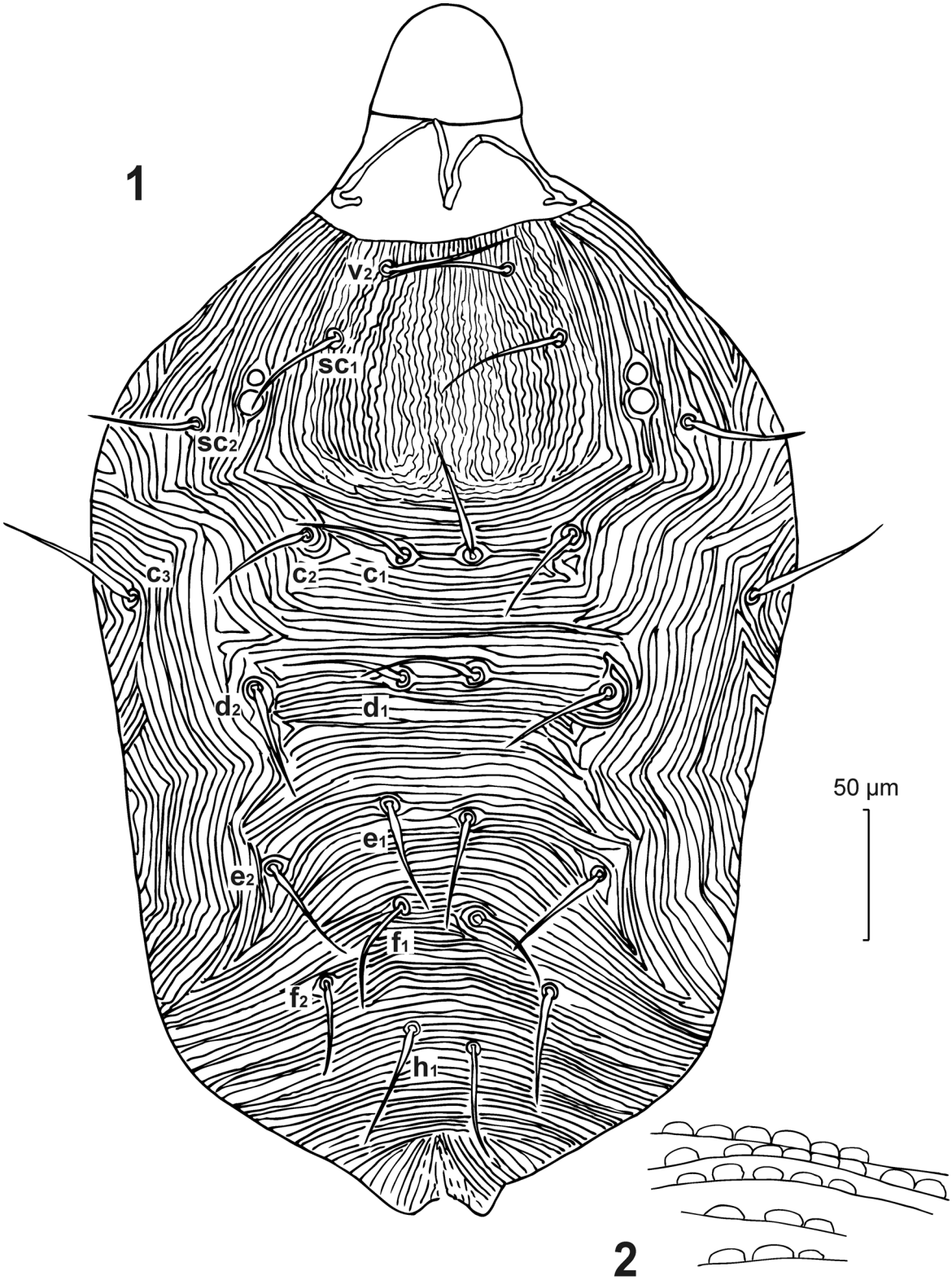
This species was only known from Malaysia where it was found on *Colocasia* sp.

Specimens examined. Three females and 3 males on *Colocasia esculenta* (L.) Schott (Araceae), Amphoe Phutthamonthon, Nakhom Pathom province, Thailand, 23/12/2011, Leg. H.H. Naing and A. Chandrapatya.

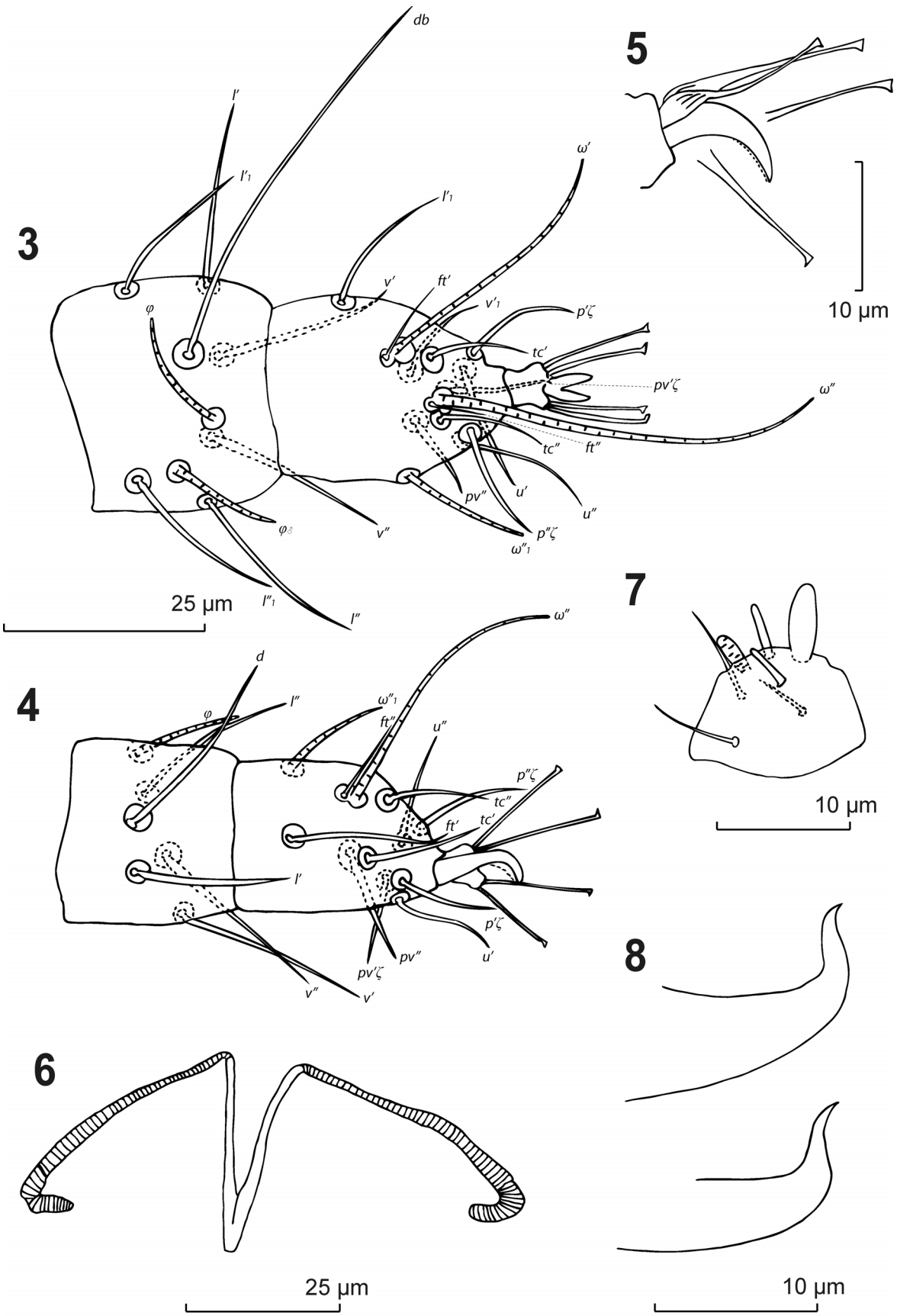
Schizotetranychus krungthepensis sp. nov. Naing & Auger
(Figures 1–14)

Type-specimens. Holotype (male), 2 male and 4 female paratypes on 7 preparations from sugarcane (*Saccharum officinarum* L.) (Poaceae), Ram Intra, Bangkok, Thailand, 17/11/2010, Leg. H. H. Naing. Holotype, 1 male and 3 female paratypes deposited in the Insect Museum of Department of Entomology, Faculty of Agriculture, Kasetsart University, Bangkok 10900, Thailand; 1 male and 1 female deposited in the collection of the Centre de Biologie pour la Gestion des Populations (CBGP), coll. Auger-Migeon N° 1819-1820, 34988 Montferrier-sur-Lez, France.

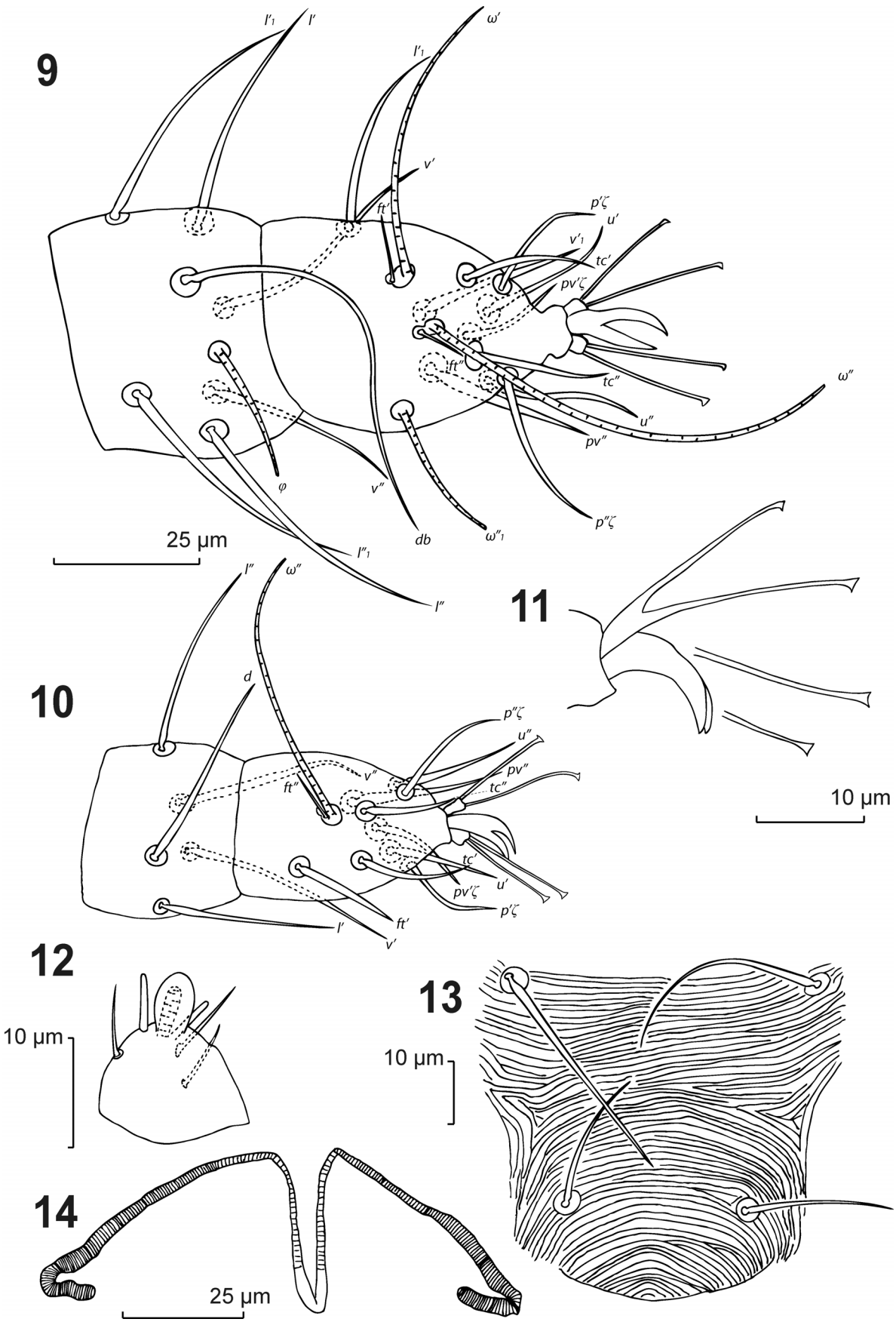
Diagnosis. Female idiosoma oval-shaped, with transverse dorsal hysterosomal integument striae on dorsocentral area, dorsocentral hysterosomal setae about as long as longitudinal distance to base of seta next behind, genital area provided with genital flap and area anterior to it bearing transverse striation and with 7 tactile setae and 1 solenidion on tibia I. End of peritreme hooked. Male aedeagus bent dorsad with slender distal part slightly curved caudad.



FIGURES 1–2. *Schizotetranychus krungthepensis* **sp. nov.**, female. 1, dorsal aspect; 2, lobes on dorsal striae between f_1 and h_1 setae (enlarged).



FIGURES 3–8. *Schizotetranychus krungthepensis* **sp. nov.**, male. 3, tarsus and tibia I; 4, tarsus and tibia II; 5, empodium I; 6, peritreme; 7, palptarsus; 8, aedeagi (variations).



FIGURES 9–14. *Schizotetranychus krungthepensis* **sp. nov.**, female. 9, tarsus and tibia I; 10, tarsus and tibia II; 11, empodium; 12, palptarsus; 13, flap and anterogenital area; 14, Peritreme.

Description. Male: Holotype 320 µm long, 2 males measured, 314–378 µm long (including gnathosoma).

Dorsum. Dorsal body setae short, subequal in length, sc_1 the longest. Except for sc_2 and c_3 setae, dorsal setae widened in their proximal portion. Dorsocentral setae c_1, d_1, e_1, f_1, and sc_1 the most widened, f_2 and h_1 setae poorly widened proximally: v_2 28 (29–31); sc_1 33 (32–35); sc_2 23 (22–23); c_1 28 (31–32); c_2 22 (23–27); c_3 26 (25); d_1 28 (29–31); d_2 22 (23–27); e_1 25 (26–28); e_2 21 (21–24); f_1 25 (25–28); f_2 23 (21–23); h_1 22 (22–25).

Gnathosoma. Palptarsus terminal sensillum between two and two and half times as long as broad, 4.7–5 µm long, 1.9–2.5 µm wide. Peritreme hooked distally.

Venter. Ventral striae without lobes.

Legs. Empodia I–IV similar, composed of two claws without appendant hairs. Leg setal counts as follows:

I 2 − 1 − 10 [9] − 5[4] − 7 + (2) – 10 + (1) + 2 duplexes;
II 2 − 1 – 6 – 5 – 5 + (1) − 9 + (1) + 1 duplex;
III 1 − 1 − 2 − 3 – 4 – 7 + (1);
IV 1 − 1 − 2 – 3/2 – 5 − 7 + (1).

One tactile setae proximal to proximal duplex on tarsus I, one solenidion at or near proximal duplex level. One tactile setae and one solenidion proximal to duplex of tarsus II.

Aedeagus. Bent dorsad at right angle with shaft dorsal margin, abruptly tapering, with acute tip pointing caudad.

Female: 4 females measured. Idiosoma: length 475–524 µm (including gnathosoma), width 260–285 µm.
Dorsum. Dorsal body setae widened near base, tapering distally not well exceeding base of seta next behind but barely reaching base or about as long as longitudinal interval to base of seta next behind (variations of 4 paratypes): v_2 (50–53); sc_1 (48–51); sc_2 (41–44); c_1 (44–49); c_2 (41–45); c_3 (56–58); d_1 (46–49); d_2 (42–45); e_1 (44–48); e_2 (42–44); f_1 (44–46); f_2 (44–46); h_1 (49–52). Setae sc_2 and c_3 not widened proximally, obviously pubescent, h_1 slightly broadened proximally and distally pubescent. Other dorsal setae widened proximally, e_2 and f_2 less widened basally. Distances between setae: c_1-c_1 44–49; d_1-d_1 46–49, e_1-e_1 44–48; c_1-d_1 44–48; d_1-e_1 43–49.

Hysterosomal striation transverse with rounded to oblong lobes, most of them wider than tall.

Gnathosoma. Palptarsus spinneret about 1.5 as long as broad, 5.2–5.4 µm long, 3.4–3.5 µm wide. Peritreme hooked distally.

Venter. Ventral striation without lobes, genital flap and area immediately anterior to it bearing transverse striation. Two pairs of ventrocaudal ($h_{2\text{-}3}$) and two pairs of pseudanal setae ($ps_{1\text{-}2}$) present.

Legs. Empodia I–IV similar, as in male. Leg setal counts as follows:

I 2 − 1 − 8 [9] − 5 − 7 + (1) – 10 + (1) + 2 duplexes;
II 2 − 1 – 6 – 5 – 5 − 9 + 1 duplex;
III 1 − 1 − 2 − 3 – 4 – 7 + (1);
IV 1 − 1 − 2 – 3 – 5[4] − 7 + (1).

One tactile setae proximal to proximal duplex on tarsus I, one solenidion at or near proximal duplex level. One tactile setae proximal to duplex of tarsus II, no solenidion present.

Etymology. The species designation *krungthepensis* is named after the location where the specimens were found, in Krungthep, meaning the City of Angels, the Thai name for capital city, Bangkok.

Biological observations. The adult females are yellowish green in colour with two pairs of maculae. Eggs are white translucent becoming yellow with age. This species produces web-nests (Saito 1983) on the under-surface of the leaves.

Remarks. *Schizotetranychus krungthepensis* **n. sp.** and five other species belong to the 8th group of *Schizotetranychus* (Flechtmann 2012). In this group, the new species can be separated from *Schizotetranychus andropogoni* (Hirst) by the shape of the distal part of the peritreme (hooked distally in *S. krungthepensis* **n. sp.** *vs.* dilated distally and straight in *S. andropogoni*), by the distal part of the aedeagus (thinner in its distal portion and tapering distally in *S. krungthepensis vs*. wider and not tapering distally in *S. andropogoni*), by the spinneret size (about 2–2.5 and 1.5 as long as broad in male and female of *S. krungthepensis* **n. sp.**, respectively, whereas three times as long as wide and slightly longer than wide in male and female of *S. andropogoni*, respectively).

In addition, the fine appendant hairs observed in the empodium of *S. andropogoni* by Ehara & Wongsiri (1975) are absent in *S. krungthepensis* **n. sp.** The new species differs from *S. camur* Pritchard & Baker by the male spinneret (absent in males of *S. camur*), by the overall appearance of the aedeagus (despite a similar sigmoid shape in the two species, the upturned part of the aedeagus of *S. camur* does not gradually narrow as in *S. krungthepensis* **n. sp.**) and by the leg setal counts. It can be distinguished from *S. paraelymus* Feres & Flechtmann by the shape of the distal end of the peritreme (slightly bent in *S. paraelymus*), by the anterogenital striation (irregularly longitudinal in *S. paraelymus*), by the size and the shape of the palptarsus terminal sensillum (cylindrical in *S. paraelymus*) and by the leg setal counts. It can be separated from *S. undulatus* (Beer & Lang) mainly by the shape of the end of the peritreme (only bent in *S. undulatus*) and by the shape of the aedeagus (upturned part bent at an angle of about 45° and distal part not curved caudad with a right angle in *S. undulatus*). The last species of the group 8, *S. youngi* Tseng, can be easily distinguished from *S. krungthepensis* **n. sp.** by its aedeagus strongly S-shaped.

Genus *Oligonychus* Berlese, 1886

Oligonychus Berlese, 1886: 24; Pritchard & Baker, 1955: 270; Wainstein, 1960: 203. Type-species: *Heteronychus brevipodus* Targioni Tozzetti.

Oligonychus sacchari McGregor, 1942

In Asia this species was previously recorded from India (Gupta & Gupta 1994).

Specimens examined. Two females and 3 males on *Cymbopogon citratus* (DC.) Stapf (Poaceae), Phetchaburi province, Thailand, 18/05/2011, Leg. H.H. Naing.

Genus *Tetranychus* Dufour, 1832

Tetranychus Dufour, 1832: 276; Pritchard & Baker, 1955: 373; Wainstein, 1960: 149; Tuttle & Baker, 1968: 124; Meyer, 1974: 216. Type-species: *Tetranychus lintearius* Dufour.

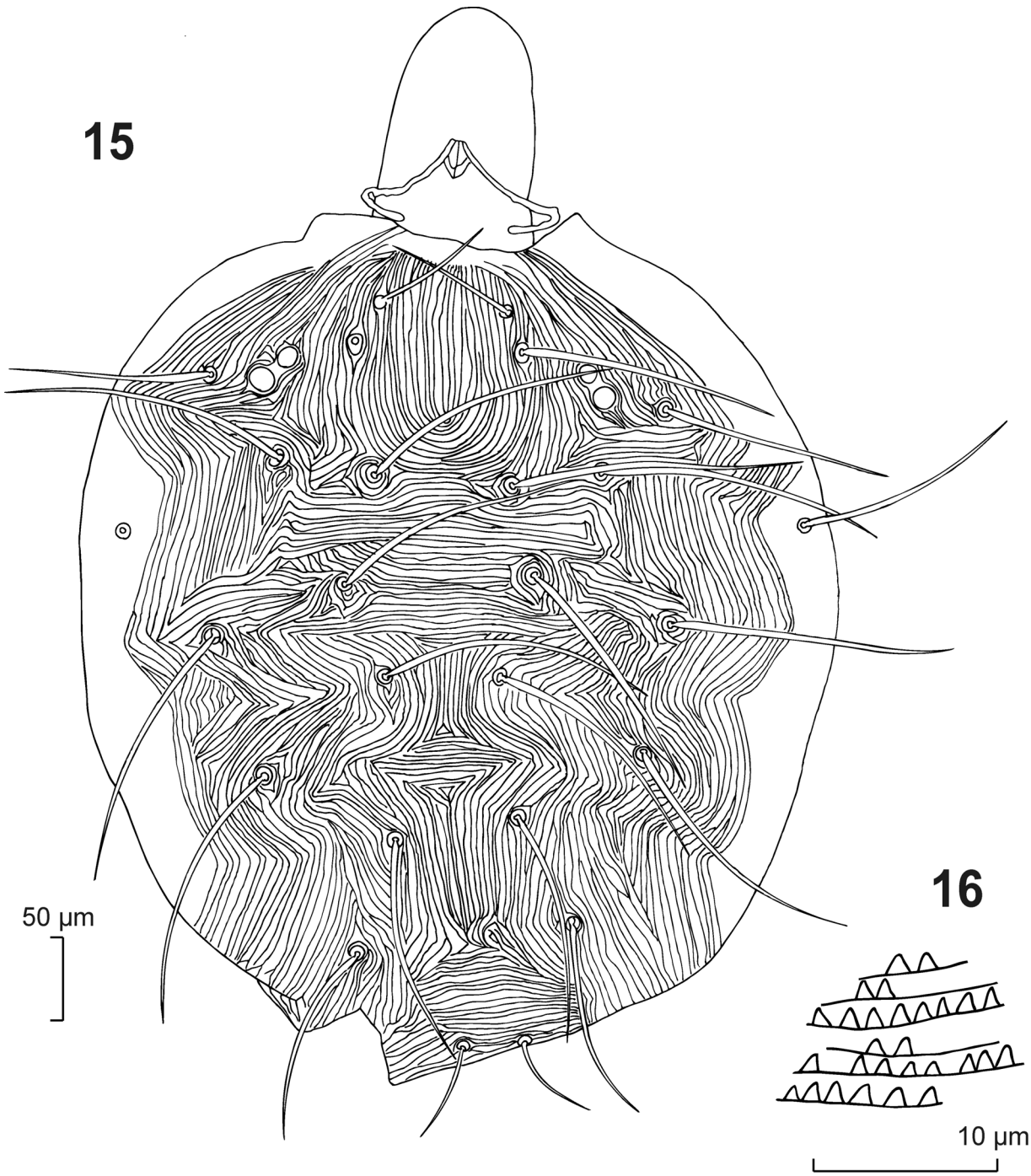
Tetranychus (*Tetranychus*) *occultaspina* sp. nov. Naing & Auger
(Figures 15–32)

Type-specimens. Holotype (male), 5 male and 7 female paratypes on 13 preparations from *Ipomoea aquatica* Forssk, (Convolvulaceae), Kasetsart University campus, Khet Bangkhen, Bangkok, Thailand, 05/08/2011, Leg. H. H. Naing. Holotype, 3 male and 5 female paratypes deposited in the Insect museum of Department of Entomology, Faculty of Agriculture, Kasetsart University, Bangkok 10900, Thailand; 2 males and 2 females deposited in the collection of the CBGP, coll. Auger-Migeon N° 1821–1824, 34988 Montferrier-sur-Lez, France.

Diagnosis. This species is a *Tetranychus sensu stricto* assigned into the ninth group as defined by Flechtmann and Knihinicki (2002). Females bear four tactile setae proximal to the proximal pair of duplex setae and the female empodia are without a dorsomedian spur. Among *Tetranychus* (*T.*) belonging to this group, this species is distinctive by the shape of the aedeagus which has a shaft slightly upturned ending in a knob whose axis forms an acute angle with the shaft's axis.

Description. Male: Holotype (415 µm long including gnathosoma). Five paratypes measured, 400–425 µm long, (including gnathosoma).

Dorsum. Dorsal body setae long, linear lanceolate, well surpassing in length distance between consecutive bases (length of holotype and variations of 5 paratypes): v_2 48 (48–53); sc_1 105 (99–107); sc_2 69 (69–74); c_1 93 (91–100); c_2 94 (78–96); c_3 81 (77–82); d_1 94 (87–94); d_2 95 (91–95); e_1 87 (82–86); e_2 89 (89–93); f_1 63 (56–69); f_2 45 (43–48); h_1 26 (23–27). Dorsal striae without lobes.

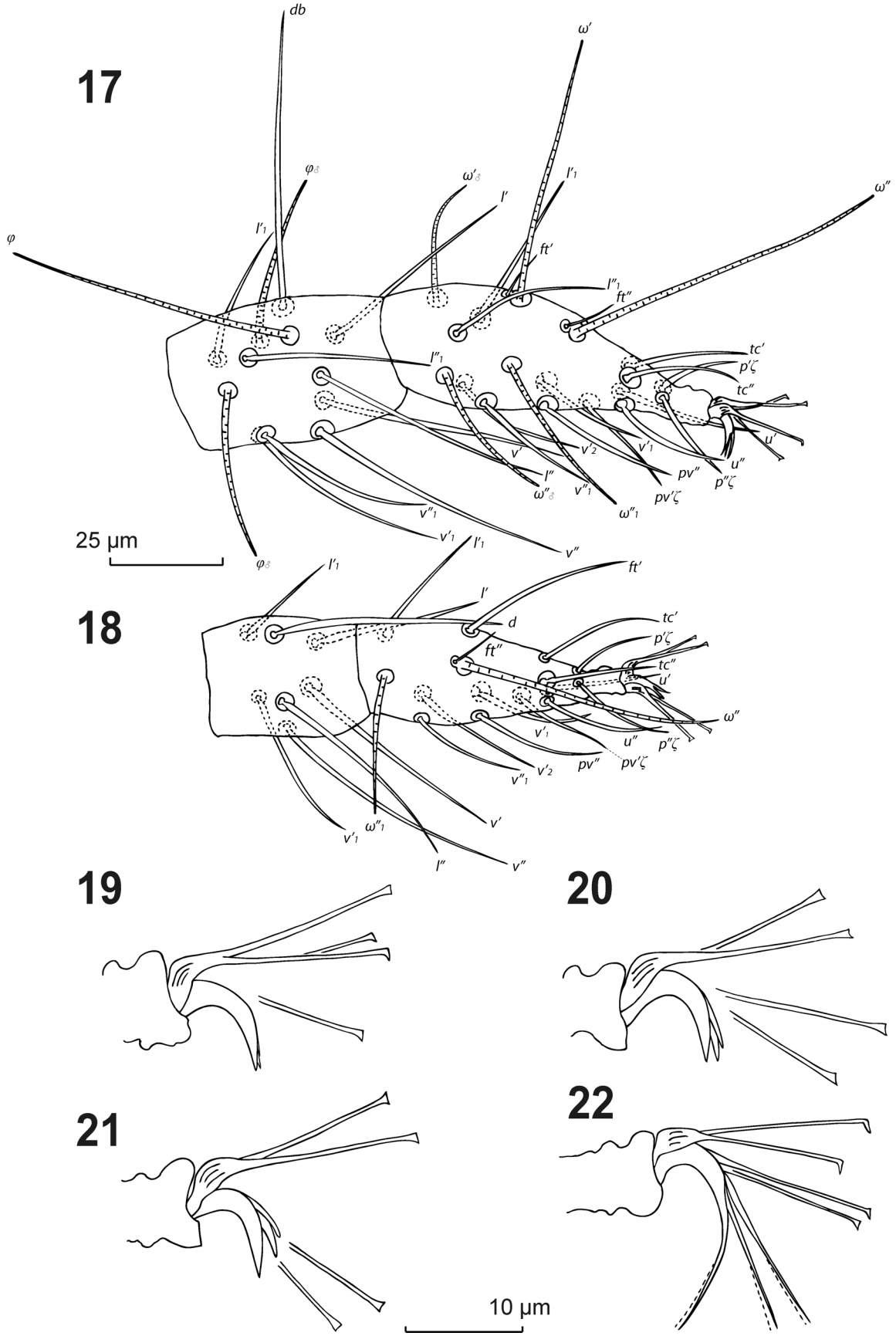


FIGURES 15–16. *Tetranychus* (*T.*) *occultaspina* **sp. nov.**, female. 15, dorsal aspect; 16, triangular lobes on dorsal striae.

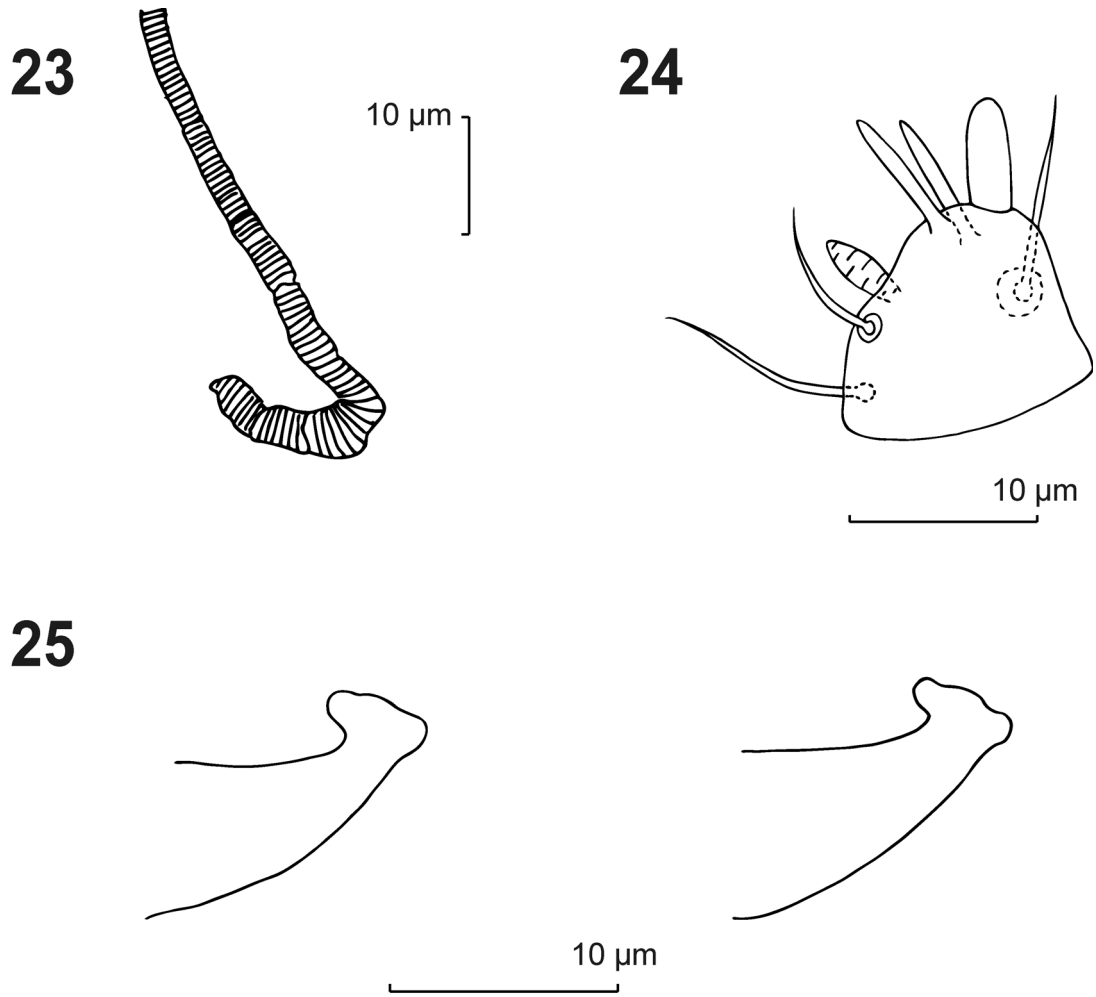
Gnathosoma. Palptarsus terminal sensillum about 2.5 times as long as broad, 5.5–6 µm long, 2.3–2.6 µm wide. Peritreme hooked distally.

Venter. Ventral striae without lobes.

Legs. Empodium I bifid, each side composed of one claw-like digit. Large mediodorsal spur present, about three-quarters length of empodium, difficult to see in perfect lateral view because concealed by empodial claws. Empodia II, III and IV without dorsal spurs and with three pairs of proximoventral hairs. Leg setal counts as follows:



FIGURES 17–22. *Tetranychus* (*T.*) *occultaspina* **sp. nov.**, male. 17, tarsus and tibia I; 18, tarsus and tibia II; 19, empodium I in a perfect lateral view; 20, 21, empodium I not in a full lateral view; 22, empodia II–IV.



FIGURES 23–25. *Tetranychus* (*T.*) *occultaspina* **sp. nov.**, male. 23, peritreme; 24, palptarsus; 25, aedeagi (variations).

I 2 − 1 − 10 [9] − 5 − 9 + (4) – 13 + (3) + 2 duplexes;
II 2 − 1 – 6 – 5 – 7 − 13 + (1) + 1 duplex;
III 1 − 1 − 4 − 4 – 6 – 9 + (1);
IV 1 − 1 − 4 − 4 – 7 − 10 + (1).

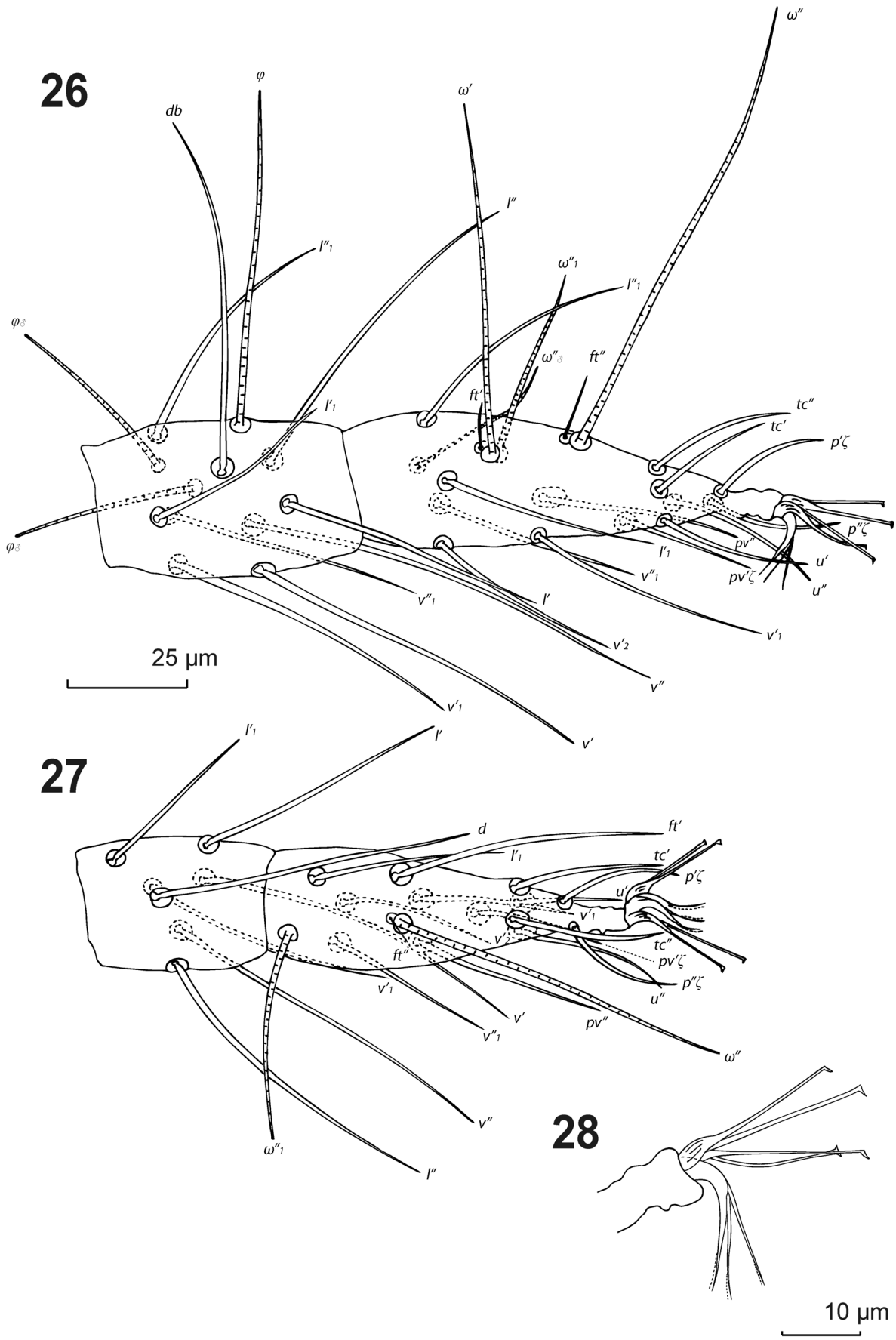
Aedeagus. Aedeagus shaft gradually narrows distally, slightly upturned. Neck short and wide, aedeagal knob axis forming an acute angle about 50° with shaft axis (range 43° – 52°, 5 males measured). Knob large 4.2 (3.9–4.3 µm), on average 1.7 times neck width 2.9 (2.1–2.9 µm), asymmetrical with poorly developed posterior rounded projection and well-developed anterior rounded projection anterodorsally directed. Knob dorsal margin undulate.

Female: 5 females measured. Idiosoma: length 505–544 µm (including gnathosoma), width 334–342 µm.

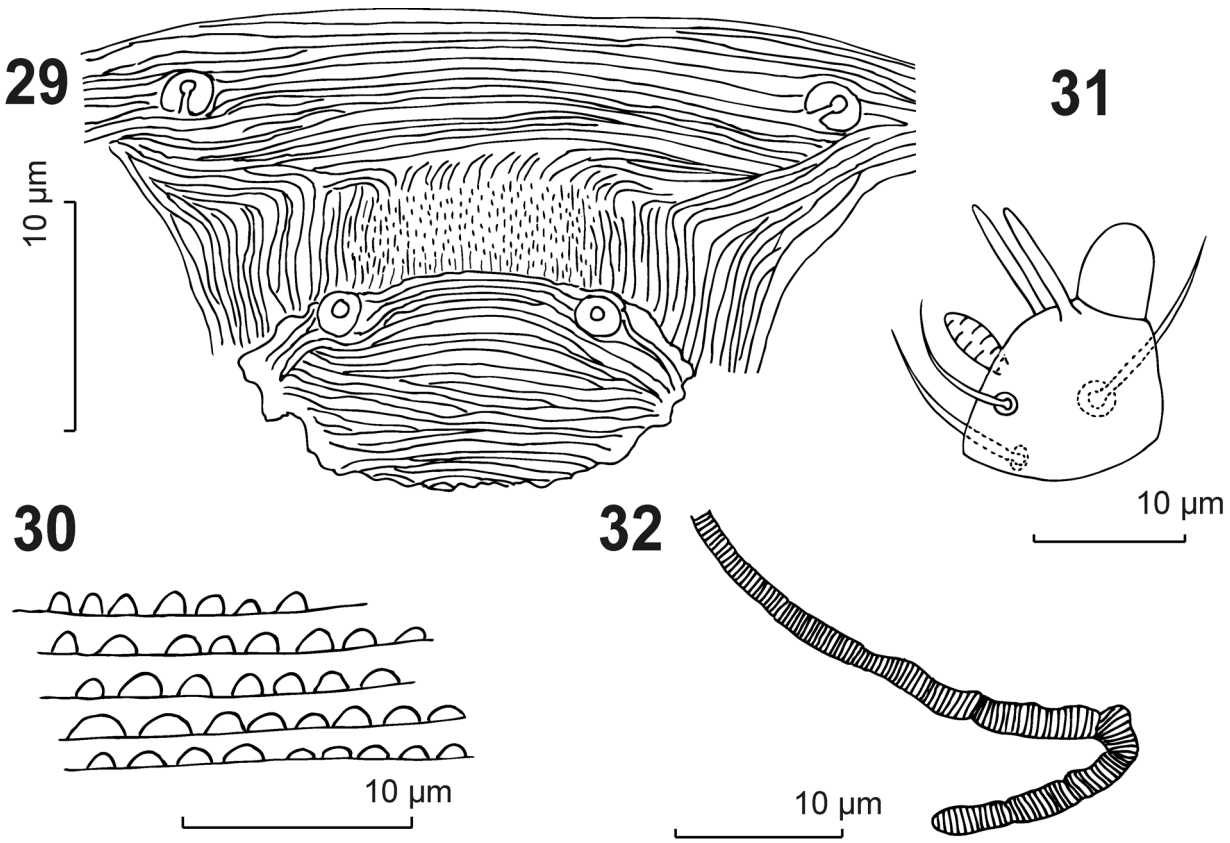
Dorsum. Dorsal body setae lanceolate, longer than distances between bases of consecutive setae (variations of 5 paratypes): v_2 60–74; sc_1 138–156; sc_2 104–114; c_1 134–148; c_2 126–142; c_3 118–126; d_1 134–152; d_2 132–142; e_1 126–134; e_2 130–142; f_1 112–120; f_2 96–100; h_1 42–46. Propodosomal striation longitudinal with rounded and oblong lobes becoming triangularly rounded and triangular near dorsohysterosomal setae. Hysterosomal striation transverse except between setae e_1-e_1 and f_1-f_1 (longitudinal) bases forming diamond-shaped pattern between these setae, with lobes triangular, as tall as broad to taller than broad.

Gnathosoma. Palptarsus spinneret about one and a half as long as broad. Peritreme hooked distally.

Venter. Ventral striation with rounded lobes, broader than tall, few oblong lobes also present. Area immediately anterior to genital flap with broken longitudinal striation, becoming dotted striation medially. Genital flap with transverse slightly arched striae. One pair of ventrocaudal (h_3) and two pairs of pseudanal setae ($ps_{1\text{-}2}$) present.



FIGURES 26–28. *Tetranychus* (*T.*) *occultaspina* **sp. nov.**, female. 26, tarsus and tibia I; 27, tarsus and tibia II; 28, empodium.



FIGURES 29–32. *Tetranychus* (*T.*) *occultaspina* **sp. nov.**, female. 29, flap and anterogenital area; 30, lobes on ventral striation; 31, palptarsus; 32, peritreme.

Legs. Empodia I–IV bear three pairs of proximoventral hairs and no spur was observed. Leg setal counts as follows:

I 2 − 1 − 10 − 5 − 9 + (1–3) – 13 + (1–3) + 2 duplexes;
II 2 − 1 – 6 – 5 – 7 − 13 + (1) + 1 duplex;
III 1 − 1 − 4 − 4 – 6 – 9 + (1);
IV 1 − 1 − 4 − 4 – 7 − 10 [9–11] + (1).

Tarsus I with four tactile setae and up to two additional solenidia proximal to proximal duplex setae. One solenidion at or near proximal duplex level. Tibia I with up to three solenidia instead of one as usually observed in this group.

Etymology. The species designation, "*occultaspina"*, is taken from Latin adjective and noun meaning hidden spine, and refers to the spur of male empodium I which is difficult to see when the empodium is observed in a perfect lateral view.

Biological observations. The adult females are red in colour to dark red, darkening with age and produce silk. The adult males are yellowish brown and the eggs are pale amber in colour turning into dark orange/brownish-red before hatching.

Remarks. Among the *Tetranychus* of the 9th group defined by Flechtmann and Knihinicki (2002) (including ungrouped species that bear four tactile setae proximal to the proximal duplex setae on tarsus I), the aedeagus of *T. occultaspina* is quite close to those of *Tetranychus bellottii* Flechtmann, *Tetranychus neocaledonicus* André, *Tetranychus puschelii* Meyer, *Tetranychus afrindicus* Nassar & Ghai, *Tetranychus papayae* Nassar & Ghai and *Tetranychus ismaili* Yusof & Zhang. *Tetranychus occultaspina* can be distinguished from *T. bellottii* by its anterior aedeagal angulation which is rounded *vs.* acute in *T. bellottii* and by the angle formed between the knob's axis and the shaft's axis, which is greater in *T. occultaspina.* The aedeagus of *T. occultaspina* differs from those of *T.*

neocaledonicus and *T. puschelii* by the shape of its aedeagal knob which is more flattened with a dorsal margin not indented but undulated. It can be separated from *T. afrindicus* and *T. papayae* according to the shape of its aedeagal anterior projection which is rounded whereas it is angulate in the two others species and by the angle formed between the knob axis and the shaft's axis. In *T. ismaili* aedeagal projections are acute whereas rounded in *T. occultaspina*.

Additional solenidia are sometimes present on tibia I and tarsus I of *T. occultaspina*: one to two on tarsus I (proximal to the proximal duplex) and one to two on tibia I. This unusual chaetotaxy is not specific to *T. occultaspina*. Indeed, hypertrichous forms have already been reported in some strains of *Tetranychus* species belonging to the 9th group (Auger *et al.* 2013). It is known to occur in the two colour forms (green and red) of *Tetranychus urticae* Koch and also in *Tetranychus gloveri* Banks (e. g. McGregor (1950); Boudreaux (1956, 1958); Zhang & Jacobson (2000)).

Tetranychus (*Tetranychus*) *truncatissimus* sp. nov. Naing & Auger
(Figures 33–51)

Type-specimens. Holotype (male), 2 males and 9 females on 12 preparations from *Bambusa multiplex* (Lour.) Raeusch. ex Schult. (Poaceae), Khet Chatuchak, Bangkok, Thailand, 19/10/2010, Leg. H. H. Naing, A. Chandrapatya, P. Maneesakorn. Holotype, 1 male and 8 female paratypes deposited in the Insect museum of Department of Entomology, Faculty of Agriculture, Kasetsart University, Bangkok 10900, Thailand; 1 male and 1 females deposited in the collection of CBGP, coll. Auger-Migeon N° 1825–1826, 34988 Montferrier-sur-Lez, France.

Diagnosis. This species is a *Tetranychus* (*Tetranychus*) assigned into the sixth group (Flechtmann & Knihinicki 2002). In this group (female tarsus I with proximal pair of duplex setae in line with 3 tactile setae, one tactile setae proximal to the proximal duplex and female empodium with obvious dorsomedian spur), this species can be separated from its allied species by the shape of the male aedeagus.

Description. Male: Holotype 303 µm long, 2 males measured, (324–329) µm long (including gnathosoma).

Dorsum. Dorsal body setae long (length of holotype and variations of 3 paratypes): v_2 44 (43–47); sc_1 82 (80); sc_2 55 (56–59); c_1 62 (66); c_2 62 (66–68); c_3 57 (65–66); d_1 68 (64–69); d_2 72 (66–68); e_1 60 (60–63); e_2 58 (63–68); f_1 38 (39–46); f_2 38 (35–38); h_1 20 (19). Lobes present on dorsal striation (poorly developed in our mountings thus their shape was not recognizable).

Gnathosoma.Palptarsus terminal sensillum about 2.2 times as wide as broad, 4.5–4.6 µm long, 2–2.1 µm wide. Peritreme hooked distally.

Venter. Ventral striae without lobes.

Legs. Empodia I–IV each with obvious dorsal spur; more prominent on empodium I, smaller on empodium II and less prominent on empodia III and IV. Empodium I claw-like (uncinate), empodia II–IV each with proximoventral hairs long and free. Leg setal counts as follows:

I 2 − 1 − 10 − 5 − 9 + (4) – 13 + (3) + 2 duplexes;
II 2 − 1 – 6 – 5 – 7 − 13 + (1) + 1 duplex;
III 1 − 1 − 4 − 4 – 6 – 9 + (1);
IV 1 − 1 − 4 − 4 – 7 − 10 + 1.

Aedeagus. Aedeagal shaft bent dorsad at nearly right angle. Neck very short. Aedeagal knob axis forming an angle about 40° with shaft dorsal margin. Aedeagal knob small (1.9 µm in holotype), asymmetrical, with rounded anterior projection and pointed duck-beak like posterior projection posterodorsally directed. Shallow depression present on knob dorsal margin between the two projections.

Female: 9 females measured. Idiosoma: length 407 – 500 µm including gnathosoma, width 240–295 µm.

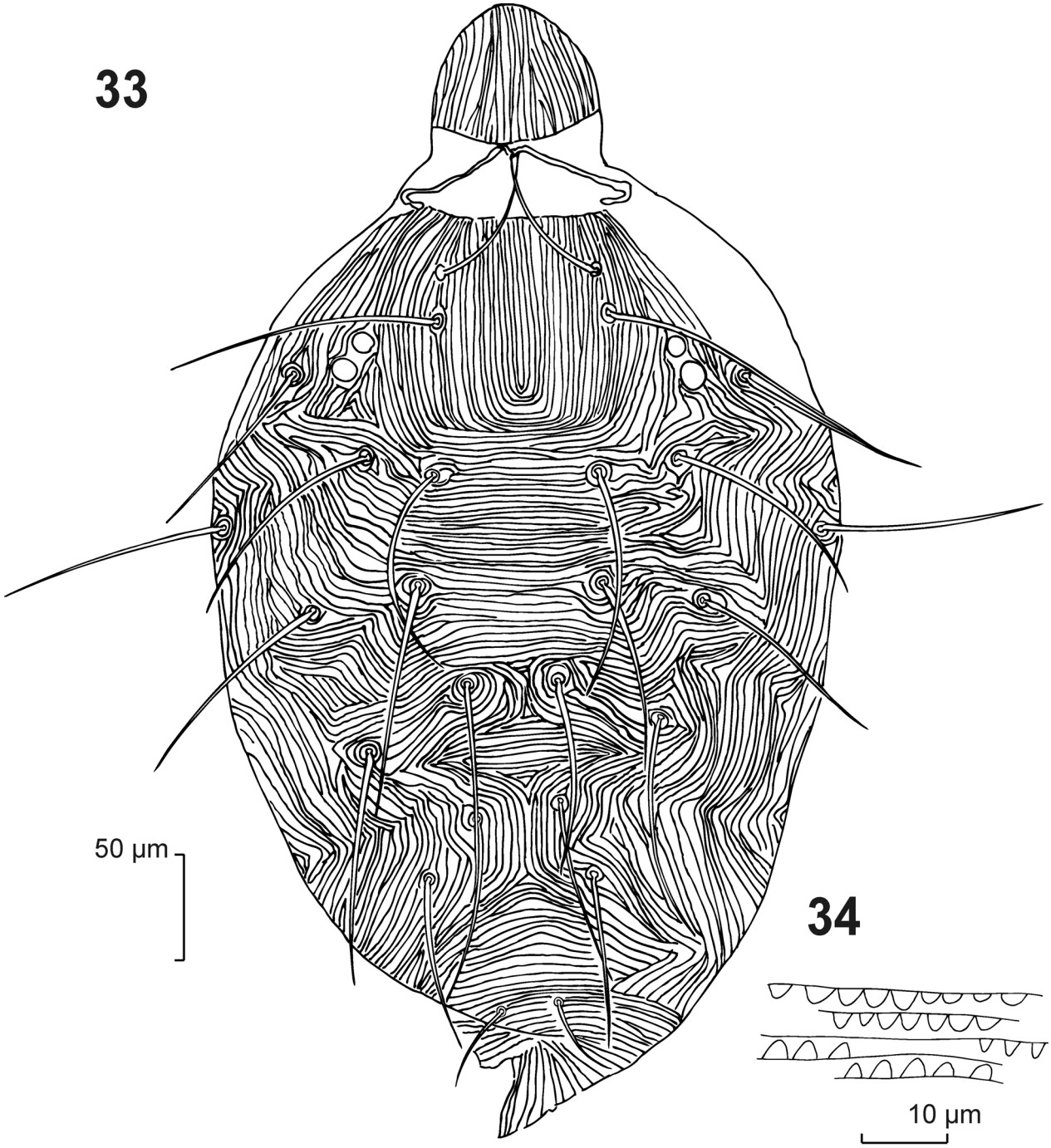
Dorsum. Dorsal body setae lanceolate, longer than distances between bases of consecutive setae (variations of 9 paratypes): v_2 64–71; sc_1 114–127; sc_2 79–94; c_1 97–116; c_2 92–112; c_3 90–107; d_1 95–114; d_2 96–115; e_1 88–112; e_2 91–115; f_1 77–97; f_2 70–83; h_1 37–46. Propodosomal striation longitudinal, hysterosomal striation transverse except between bases of *e*1 and *f*1 setae (longitudinal) leads to form diamond-shaped pattern between these setae.

Lobes on prodorsal striation rounded, dorsal hysterosomal striae with rounded to triangularly rounded lobes as tall as broad, wider caudally.

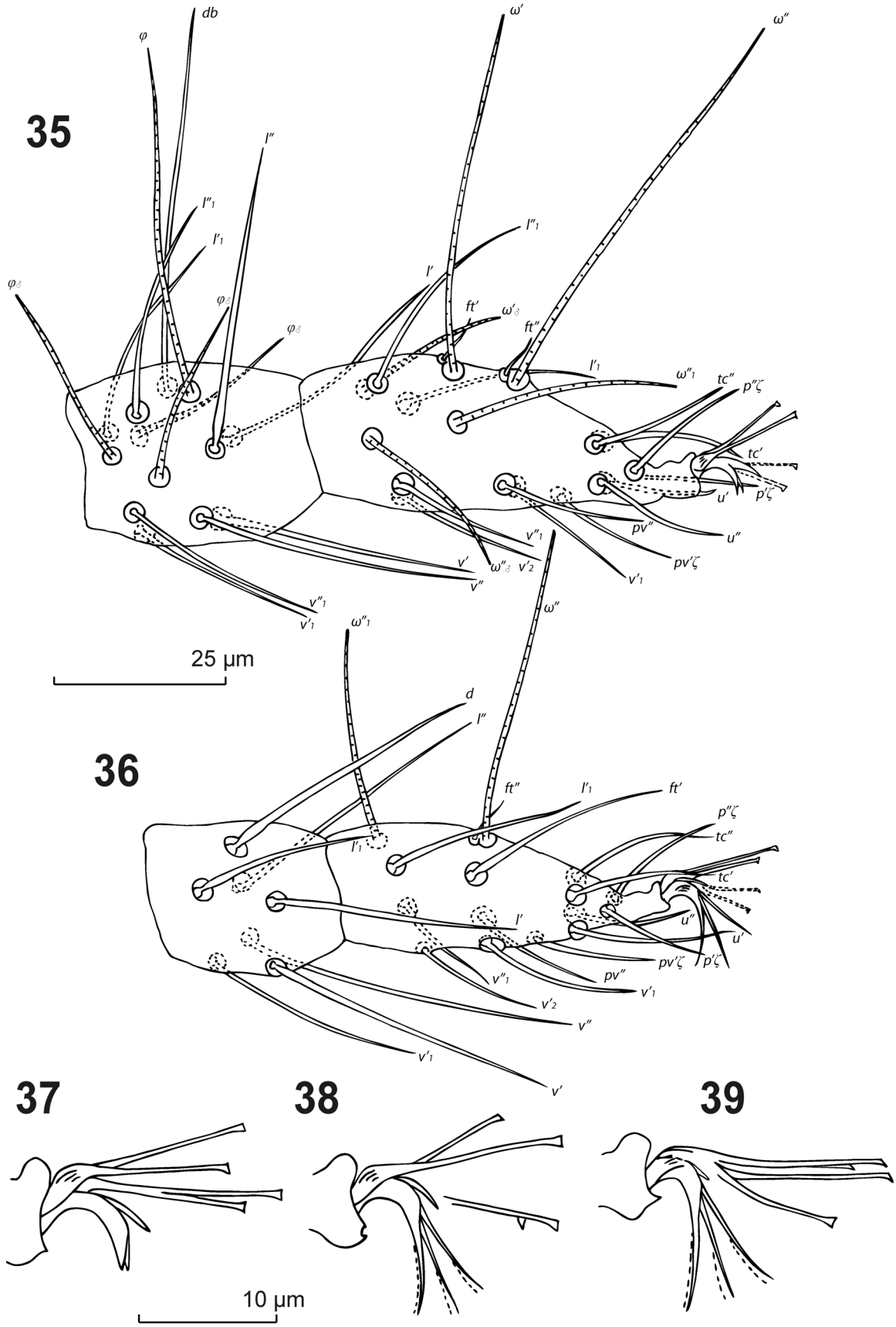
Gnathosoma. Palpus with spinneret about one and a half times as long as broad. Peritreme hooked distally.

Venter. Genital flap with transverse striation. Area immediately anterior to genital flap with broken longitudinal striae. Rounded lobes present on ventral striation, broader than tall, wider medially. One pair of ventrocaudal and two pairs of pseudanal setae present.

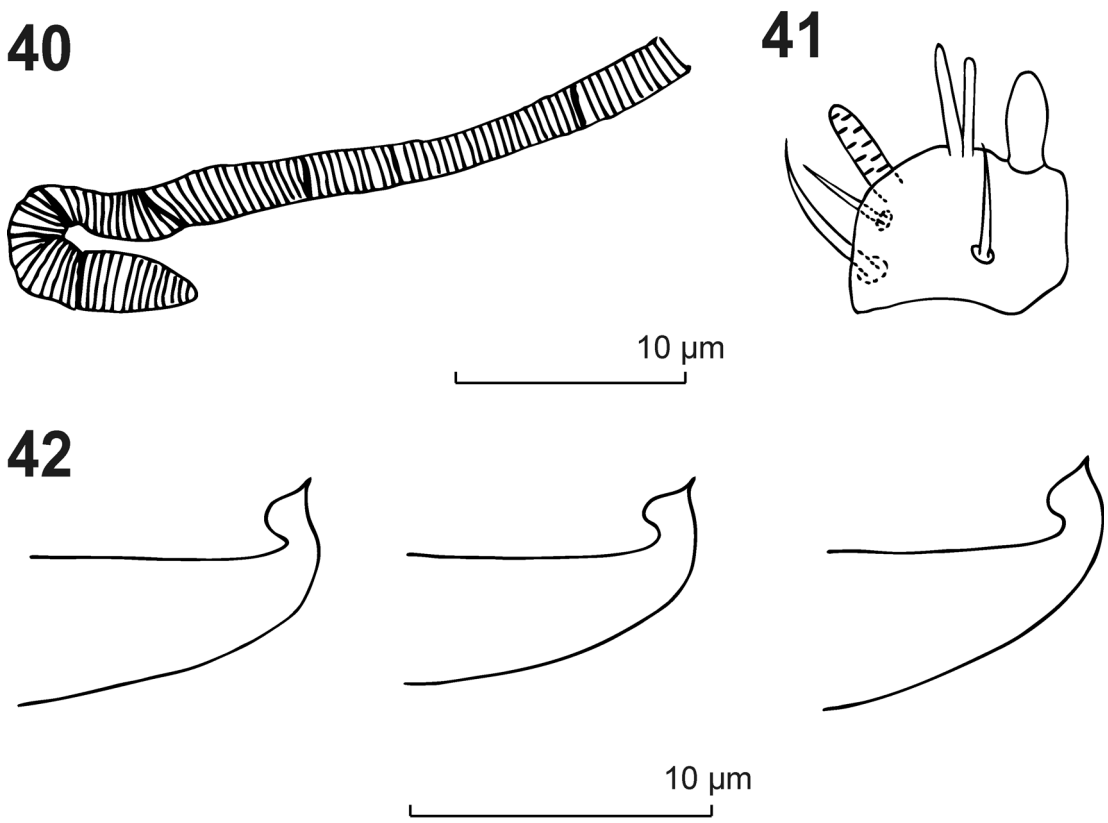
Legs. Empodia I–IV each with obvious dorsal spur, more prominent in empodium I (about three quarters the length of proximoventral hairs), smaller in empodium II and gradually less prominent in empodia III and IV. Empodia I–IV each with proximoventral hairs long and free. Leg setal counts as follows:



FIGURES 33–34. *Tetranychus* (*T.*) *truncatissimus* **sp. nov.**, female. 33, dorsal aspect; 34, lobes on dorsal striae.



FIGURES 35–39. *Tetranychus* (*T.*) *truncatissimus* **sp. nov.**, male. 35, tarsus and tibia I; 36, tarsus and tibia II; 37, empodium I; 38, empodium II; 39, empodia III–IV.



FIGURES 40–42. *Tetranychus* (*T.*) *truncatissimus* **sp. nov.**, male. 40, peritreme; 41, palptarsus; 42, aedeagi (variations).

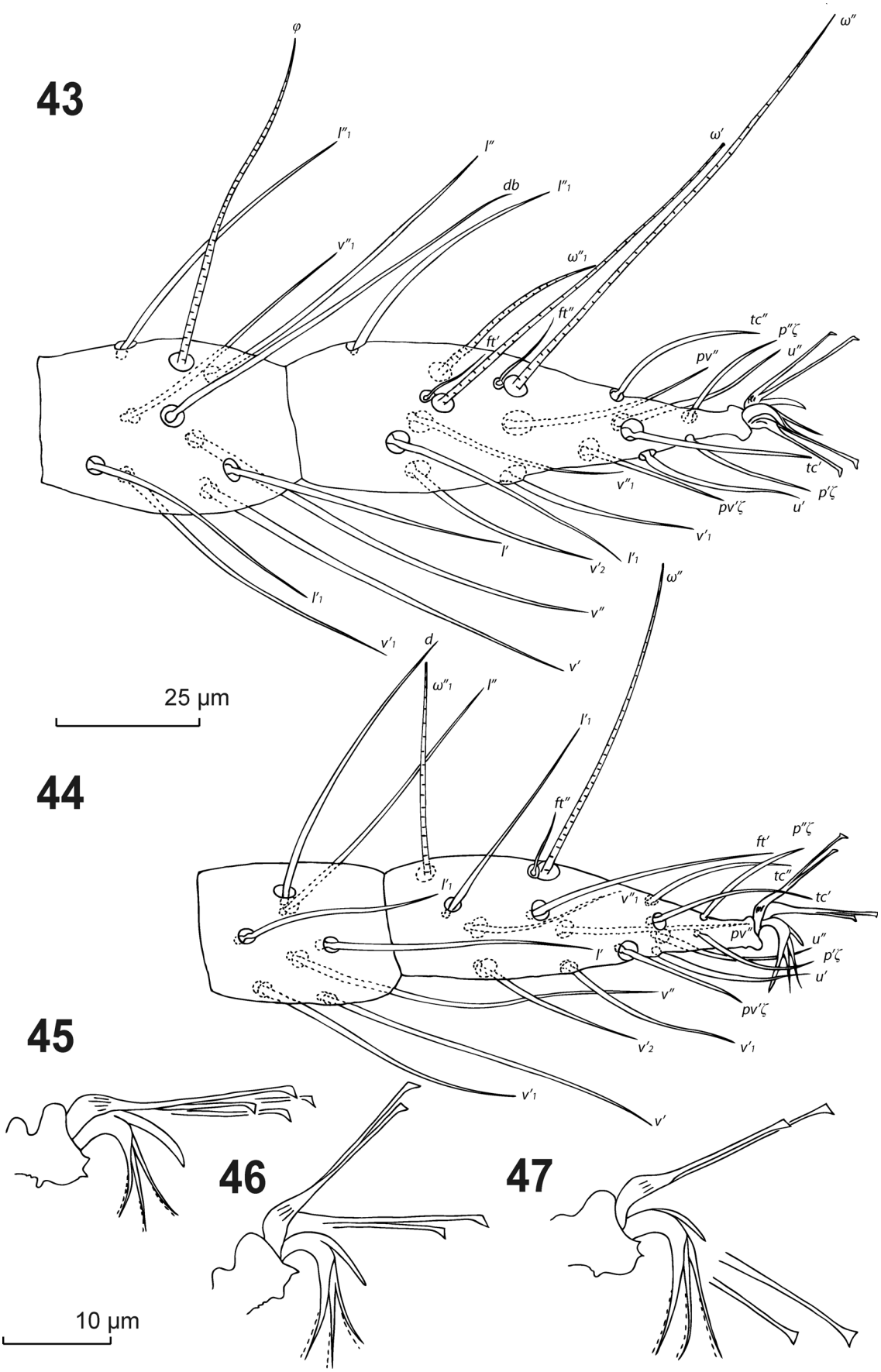
I 2 − 1 − 10 − 5 − 9 + (1) – 13 + (1) + 2 duplexes;
II 2 − 1 – 6 – 5 – 7 − 13 + (1) + 1 duplex;
III 1 − 1 − 4 − 4 – 6 – 9 + (1);
IV 1 − 1 − 4 − 4 – 7 − 10 + (1).

Tarsus I with 1 tactile seta proximad to proximal duplex setae, 3 tactile setae more or less in line with proximal duplex, one solenidion at or near proximal duplex level.

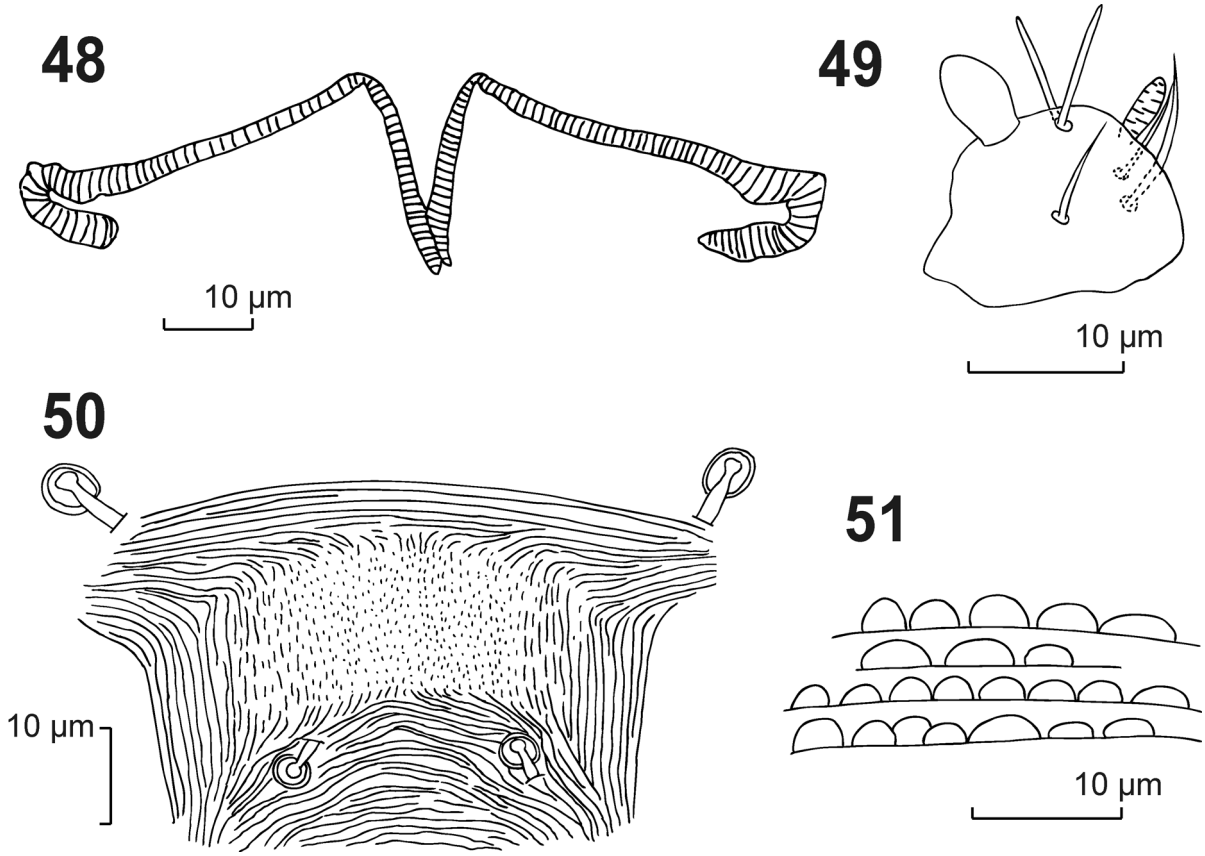
Etymology. The name of the species designation is the Latin superlative of the species name of *T. truncatus*, meaning the most truncate.

Biological observations. Mites are located on the lower surface of the leaf. The adult females are pale yellow in colour with a pair of dark feeding spots. They produce silk and laid translucent eggs becoming yellowish with age. The males and the juvenile stages are also pale yellow.

Remarks. This new species can be easily separated from other species belonging to the 6th group of *Tetranychus* (Flechtmann & Knihinicki 2002) by the shape of its aedeagus. However its aedeagus resembles those of two species that belong to the 8th group and one belonging to the 9th group: *Tetranychus gloveri* Banks, *Tetranychus tumidus* Banks and *Tetranychus merganser* Boudreaux respectively. *Tetranychus truncatissimus* is easily distinguishable from these species by: 1) its body colour, yellow *vs.* red or carmine, 2) the setal arrangement on the female foretarsus; 3) the size of the female empodial spurs, well developed in *T. truncatissimus vs.* absent, tiny or small in the above mentioned species; 4) the aedeagal knob, small, posterodorsally directed with an angle of 45° with the axis of the shaft and with a very short neck. With the exception of the tarsus setal arrangement, the body colour and the development of dorsomedian spurs, *T. truncatissimus* resembles to *Tetranychus truncatus* Ehara by the shape of its aedeagus. However, in *T. truncatissimus* the aedeagal hook is shorter than in *T. truncatus* which was already described as having a truncate hook.



FIGURES 43–47. *Tetranychus* (*T.*) *truncatissimus* **sp. nov.**, female. 43, tarsus and tibia I; 44, tarsus and tibia II; 45, empodium I; 46, empodium II; 47, empodia III–IV.



FIGURES 48–51. *Tetranychus* (*T.*) *truncatissimus* **sp. nov.**, female. 48, peritreme; 49, palptarsus; 50, flap and anterogenital area; 51, lobes on ventral striation.

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