

## ***Schwendingeriella tapanensis* gen. nov., sp. nov., a new remarkable representative of Uropodina mites from Thailand (Acari: Mesostigmata: Urodinychidae)**

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### **Abstract**

A new mite genus, *Schwendingeriella* **gen. nov.** (Mesostigmata: Uropodina: Urodinychidae), with *Schwendingeriella tapanensis* **sp. nov.** as type species, is described on the basis of 12 females and nine males collected in soil samples from Thailand. The new genus has a unique character combination which has not been previously observed within the family Urodinychidae: numerous needle-like prolongations on the anterior margin of the female genital shield; the presence of a pygidial shield; an unusual web-like structure on the dorsal shield; the wide and marginally pilose internal malae on the gnathosoma, and the palp apothele with four branches.

**Keywords:** Uropodina, new genus and species, taxonomy, South-East Asia

### **Introduction**

Uropodina mites (Mesostigmata) are a well-characterized group of soil invertebrates. They occur in all region of the world, but they can be found with a high diversity in tropical regions (Lindquist *et al.* 2009). The family Urodinychidae Berlese, 1917 seems to be one of the most confusing families within the Uropodina. Currently, the genera placed in this family (Kontschán 2013) are characterized by elongate *hl* setae, an internal sclerotized node associated with the levator tendon on the chelicerae, apically smooth corniculi and the presence of pedofossae. Recently several new genera have been described from this family (e.g. Błoszyk *et al.* 2020; Kontschán 2011a, 2018; Kontschán *et al.* 2021).

During the last decade, the first author spent numerous weeks in the Natural History Museum of Geneva to study the diversity of tropical Uropodina mites. Among their South-East Asian soil samples, an unusual urodinychid mite was found which differs from the other known genera in several unusual characters. Here, we propose a new genus to accommodate this new mite species.

### **Material and methods**

Specimens investigated were cleared in lactic acid for two weeks and afterwards investigated with a Leica 1000 scientific microscope with a drawing tube. Photographs were taken with a Keyence 5000 digital microscope. Specimens examined are stored in 70% ethanol and deposited in the Natural History Museum, Geneva (NHMG). Measurements are given in micrometers (µm).

## Taxonomy

### *Schwendingeriella* gen. nov.

Type species. *Schwendingeriella tapanensis* sp. nov. Monotypic. Genus based on adult female and male material representing one newly described species.

### Diagnosis

Idiosoma oval, dorsally domed, pygidial shield present. All dorsal setae bulbiform and apically pilose. Dorsal shield with unusual web-like structure. Some furrows situated on ventral shield lateral to anal opening. Genital shield of female scutiform, male genital shield oval without eugenital setae. Anterior margin of genital shield of female with numerous needle-like prolongations. Peritreme M-shaped. Base of tritosternum narrow and vase-like with one pair of lateral spines, apically serrate, its laciniae pilose and subdivided into three branches. Internal malae on gnathosoma wide and marginally pilose, corniculi horn-like, setae *h1* needle-like, *h3–h4* serrate in both genders, *h2* needle-like in females and dot-like in males. Ventral setae on palp trochanter serrate. Chelicerae with internal sclerotized nodes, movable digit a little shorter than fixed digit and bearing four teeth, fixed digit without any teeth. Tarsi of leg I without ambulacrum and claws; majority of leg setae smooth, but numerous pilose and serrate setae also visible.

### Etymology

We dedicate the new genus to Dr. Peter Schwendinger, who organized and aided biodiversity studies on the Uropodina in the Natural History Museum, Geneva (NHMG).

### Gender

Feminine.

### Remarks

Based setae *h1* being long, chelicerae with an internal sclerotized node and without a mushroom- or flower-shaped sensory organ on the fixed digit, and corniculi which are smooth apically, we can place the new genus in the family Urodinychidae; however all taxa within this family merit revision.

The unique character combination (e.g., numerous needle-like prolongations on the anterior margin of the genital shield of the female; the presence of a pygidial shield; an unusual web-like structure on the dorsal shield; and the wide and marginally pilose internal malae on the gnathosoma) of the new genus has never previously been seen in another member of the family Urodinychidae.

The herein observed anterior processes are highly unique within Uropodina. Several different appendages are observed on the female genital shield in different species and other taxa. Most of the known Uropodina do not have any anterior appendages on the female genital shield (Błoszyk *et al.* 2017). Several species have shorter or longer simple appendages, and a very few species bear bifurcated processes (see Błoszyk *et al.* 2017; Kontschán 2015; Kontschán & Kiss 2015). Some species have very wide and triangular appendages (see Athias-Binche & Błoszyk 1985), but numerous needle-like prolongations were never observed so far within the known Uropodina mites.

### *Schwendingeriella tapanensis* sp. nov.

(Figures 1–26)

### Diagnosis

As for the genus.

*Material examined*

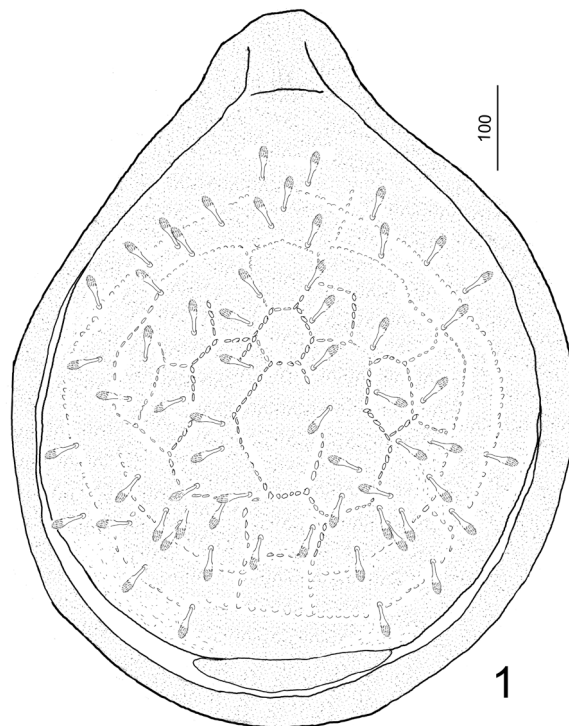
*Holotype*. Female. TH-04/17 Thailand, Phang Nga Province and City near Tapan Cave, 8°27'14,6''N, 98°31'417''E, 20 m a.s.l., soil at base of limestone cliff, 9 September 2004, P. Schwendinger coll. *Paratypes*. Eleven females and nine males, with the same collection data as those for the holotype.

*Description*

**Female** (n=12). Length of idiosoma 840–850, width at level of coxae IV 660–675, color reddish-brown. Shape of idiosoma oval with a small vertex, dorsally domed.

*Dorsal idiosoma* (Figures 1 and 21). Marginal and dorsal shields fused anterolaterally. Dorsal shield covered by web-like structures forming pentagonal and hexagonal cells. Some small oval pits (ca 1–2×1–2) situated within these cells. All dorsal setae (32–35 pairs) (ca 39–48) long and bulbiform and apically pilose (Figure 3). Pygidial shield present ca 35–38 long and ca 230–242 wide, its surface without setae and sculptural pattern. Surface of marginal shield smooth and without any marginal setae.

*Ventral idiosoma* (Figures 2, 4, 5, 22–23). Five pairs of sternal setae presented. Setae *st1–st3* longer (ca 12–16), *st4* and *st5* shorter (ca 6–7). Setae *st1–st4* marginally pilose, *st5* smooth and needle-like. Setae *st1* inserted close to anterior margin of sternal shield, *st2* at level of mid-coxae II, *st3* at level of anterior margin of coxae III, *st4* at level of posterior margin of coxae III, *st5* close to basal margin of genital shield. Sternal shield smooth, three pairs of poroid-like structures situated close to *st3*, *st4* and *st5*, one pair of lyrifiform fissures close to *st4*. One pair of long (from the end of pedofossae IV to anal opening) L-shaped furrows with two lateral branches on external margin situated on ventral shield. 10–15 pairs of ventral setae short (ca 11–15) and apically pilose. Surface of ventral shield ornamented by oval pits (ca 5–6×5–6) (Figure 4). Anal opening oval (20–22 long and 14–15 wide), anal valves smooth, without euanal setae. Adanal and postanal setae absent.



**FIGURE 1.** Dorsal view of *Schwendingeriella tapanensis* gen. nov., sp. nov., holotype, female.

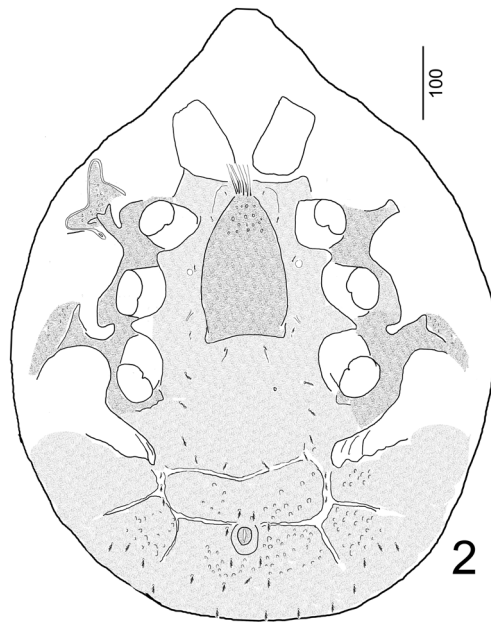
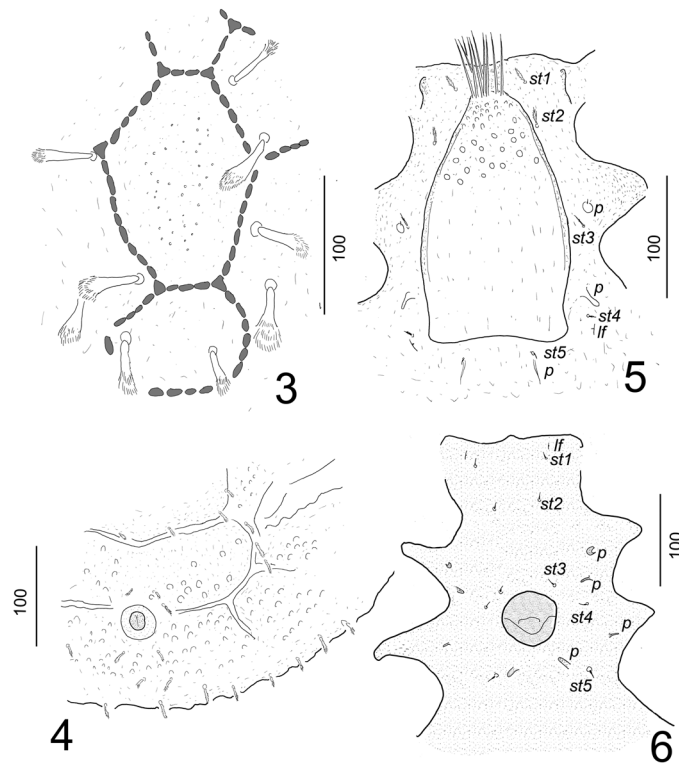
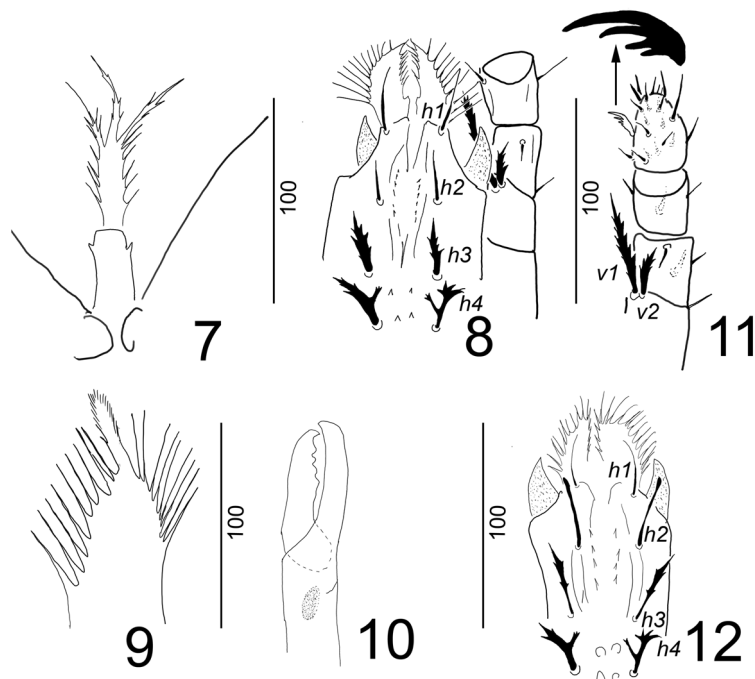


FIGURE 2. Ventral view of *Schwendingeriella tapanensis* **gen. nov.**, **sp. nov.**, holotype, female.



FIGURES 3–6. *Schwendingeriella tapanensis* **gen. nov.**, **sp. nov.**, holotype, female. 3. Dorsal setae and sculptural pattern; 4. Anal region on ventral shield; 5. Intercoxal area of female; 6. Intercoxal area of male paratype.



**FIGURES 7–12.** *Schwendingeriella tapanensis* gen. nov., sp. nov., holotype, female. 7. Tritosternum; 8. Ventral view of gnathosoma; 9. Epistome; 10. Lateral view of chelicera; 11. Ventral view of palp (arrow shows the palp apothele in higher magnification); 12. Ventral view of gnathosoma of male paratype.

Genital shield (Figures 5, 25) linguliform, length 200–210, basal width 120–125, situated between coxae II and IV; anterior margin of female genital shield bearing numerous needle-like prolongations, anterior part of surface covered by oval pits (4–5×4–5). Stigmata situated between coxae II and III. Peritremes with M-shaped prestigmatid part, postsigmatid part absent. Pedofossae deep, their surface smooth, with separate furrow for tarsi IV. Tritosternum with vase-like base, with one pair of apical spines. Its laciniae pilose and subdivided into three branches (Figure 7).

*Gnathosoma* (Figures 8, 26). Corniculi small, smooth and horn-like inserted posteriorly to *h1*; internal malae wide and pilose, three times as long as corniculi. Hypostomal setae *h1* and *h2* smooth and needle-like (25–32 long), *h3* and *h4* (28–30) marginally serrate. Deutosternal groove narrow, with numerous denticles. Chelicerae with internal sclerotized nodes (Figure 10). Fixed digit of chelicerae without teeth (62–65) slightly longer than movable digit (60–62); movable digit bearing four teeth. Palp trochanter setae robust and serrate, *v1* shorter (ca 50–52) than *v2* (ca 24–26). Other setae on palp segments smooth. Palp apothele with four branches. Epistome marginally pilose (Figure 9).

*Legs.* Length of legs (from base of coxae to apex of tarsi): I 360–375, II 440–450, III 455–460, IV 475–480. Leg I without ambulacral claws; majority of setae on all legs needle-like, but some setae serrate on tarsi 2–4 and several setae pilose on other leg segments (Figures 13–20).

**Male** (n=9). Body 830–850 long and 660–670 wide.

*Dorsal idiosoma.* As in female.

*Ventral idiosoma* (Figure 24). Intercoxal area, with sternal setae and genital shield, as in Figure 6. Sternal setae ca 9–11 long, smooth and needle-like. Setae *st1* situated close to anterior margin of sternal shield, *st2* at level of mid-coxae II, *st3* and *st4* at level of anterior margin of genital shield, *st5* at level of mid-coxae IV. Surface of sternal shield smooth, one pair of lyriform fissures situated close

to *st1* and four pairs of poroid-like structures. Two pairs situated close to margin of coxae III, one pair close to coxae IV and one pair close to *st5*. Genital shield rounded, (ca 55–60×60–63), its surface smooth, without eugenital setae and situated between coxae III.

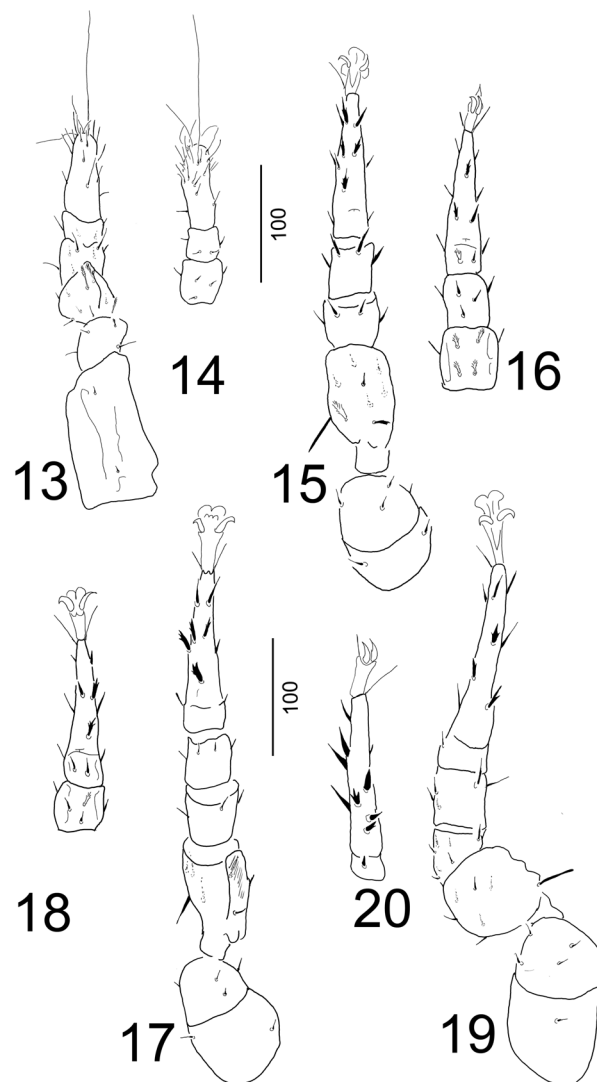
*Gnathosoma* (Figure 12). As in females, except setae *h2*, which are dot-like and ca 35–37 long.

Other characters as in female.

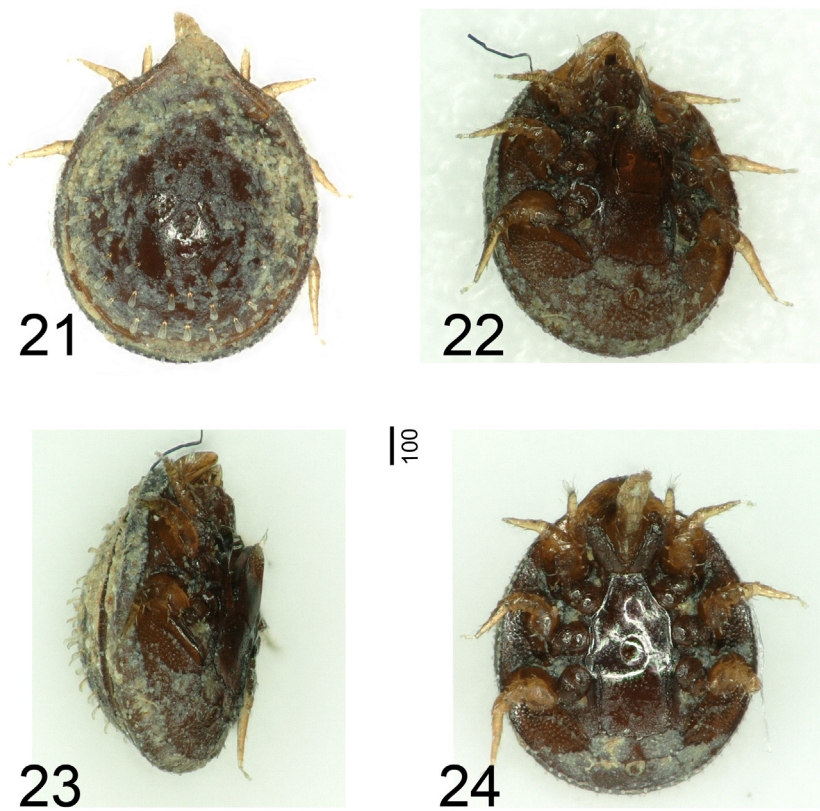
Developmental stages. Unknown.

#### *Etymology*

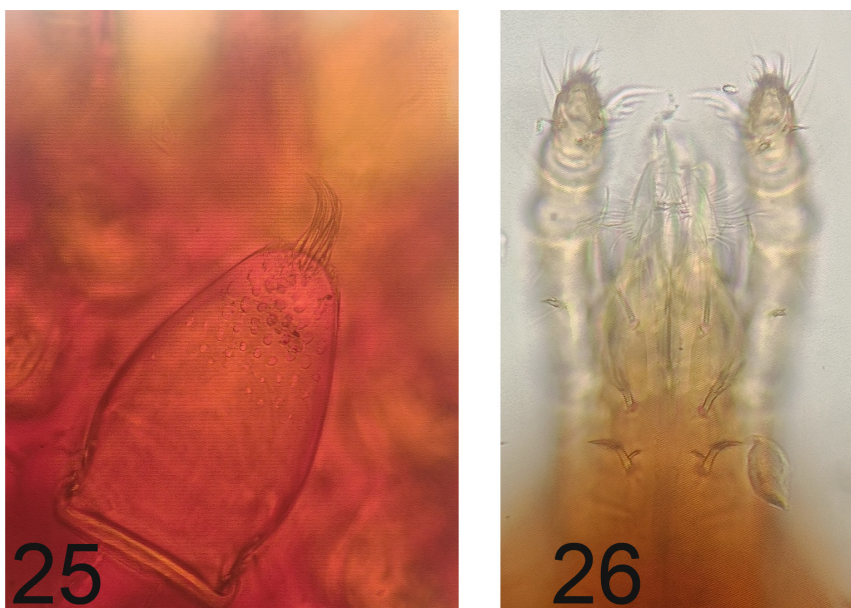
The name of the new species refers Tapan cave, which lies close to the type locality.



**FIGURES 13–20.** *Schwendingeriella tapanensis* gen. nov., sp. nov., holotype, female. 13. Leg I, ventral view; 14. Apical part of leg I, dorsal view; 15. Leg II, ventral view; 16. Apical part of leg I, dorsal view; 17. Leg III, ventral view; 18. Apical part of leg III, dorsal view; 19. Leg IV, ventral view; 20. Apical part of leg IV, dorsal view.



**FIGURES 21–24.** Photographs of *Schwendingeriella tapanensis* **gen. nov., sp. nov.**, holotype, female. 21. Idiosoma in dorsal view; 22. Idiosoma in ventral view; 23. Idiosoma in lateral view; 24. Ventral view of male paratype.



**FIGURES 25–26.** Photographs of *Schwendingeriella tapanensis* **gen. nov., sp. nov.**, holotype, female. 25. Genital shield; 26. Ventral view of gnathosoma and palp.

## Discussion

Although South-East Asia is one of the world's known biodiversity hotspots (Meyers *et al.* 2000), several countries in this area remain poorly investigated from an acarological perspective and especially for Uropodina. The Uropodina fauna of Thailand, unlike some of the better-known countries of South-East Asia such as Indonesia, Vietnam and the Philippines, seems to be barely known. Recent years saw numerous new species and genera described from Thailand (Kontschán 2010a, 2010b, 2011a, 2011b; Kontschán & Ripka 2017), such that the currently known species count for Uropodina in Thailand is still only 11, including the here described new species.

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