

**Uropodina species from the Montagne d'Ambre National Park, Madagascar (Acari: Mesostigmata)**

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**Two new Uropodina species from the Montagne d'Ambre National Park, Madagascar (Acari: Mesostigmata).** - Two new Uropodina species (*Uroobovella madagascariensis* n. sp. and *Nenteria madagascariensis* n. sp.) are described and illustrated on the basis of mite material collected from the Montagne d'Ambre National Park, Madagascar.

**Keywords:** Acarology - turtle mites - taxonomy - Afrotropical region.

## INTRODUCTION

Madagascar is the largest Afrotropical island near the eastern coast of Africa, which was separated from the continent in the Mesozoic (Flynn & Wyss, 2003). Hence the fauna of Madagascar has evolved in almost isolation from Africa resulting in a high degree of endemisms on this island (Paulian & Viette, 2003). Besides well known endemics to Madagascar, e.g. lemurs, other mammals, reptiles, etc. (Rabearivony *et al.*, 2010), there are several soil inhabiting groups with high endemisms, e.g. mites (Mahunka, 2009, 2011; Niedbała, 2004) and earthworms (Razafindrakoto *et al.*, 2010).

The Uropodina mite fauna of Madagascar is still poorly documented, with information available only for a dozen species. The first three species were presented by Vitzthum (1921), but these species were described on the basis of nymphs, hence they are only very poorly defined. Later, Hirschmann (1989, 1990, 1991), Hirschmann & Wiśniewski (1986, 1987), Wiśniewski & Hirschmann (1992) and Wiśniewski *et al.* (1992) published on Uropodina mites from Madagascar and described seven new species. Unfortunately, as in Vitzthum's (1921) work, papers of Hirschmann (1990), Hirschmann & Wiśniewski (1986, 1987) and Wiśniewski *et al.* (1992) contain original descriptions based only on nymphs, without any information about the adults. The mature stages are known only for two species (*Oplitis euchroea* Wiśniewski & Hirschmann in Hirschmann 1991 and *O. solmani* Wiśniewski & Hirschmann in Hirschmann 1991). More recently Kontschán (2007, 2010) worked on the Uropodina mites of Madagascar and presented three new species of the family Rotundabaloghiidae. Up to now, 14 Uropodina species have been recorded from Madagascar, but adults of only five species are known and hence only these can be properly identified.

The present paper contains the descriptions of two new species, which were collected by Dr Petr Baňář in the Montagne d'Ambre National Park.

## MATERIAL AND METHODS

Specimens were cleared in lactic acid and drawings were made with the aid of a drawing tube. All specimens are stored in 70% ethanol and deposited in the Soil Zoology Collections of the Hungarian Natural History Museum, Budapest (HNHM), in the Biology Centre AS CR, Institute of Soil Biology, České Budějovice (ISB) and in the Natural History Museum of Geneva (MHNG). Abbreviations: h: hypostomal setae, St: sternal setae, im: internal malae, pl: paralacinae of gnathosoma. All measurements and the scale line lengths are given in micrometres ( $\mu\text{m}$ ).

## DESCRIPTIONS OF THE NEW SPECIES

### ***Uroobovella madagascarica* sp. n.**

Figs 1-12

**HOLOTYPE:** MHNG, without registration number; female; Madagascar, Nord, Montagne d'Ambre National Park, altitude 1100m, litter sifting; 30.10.2010; leg. P. Baňář.

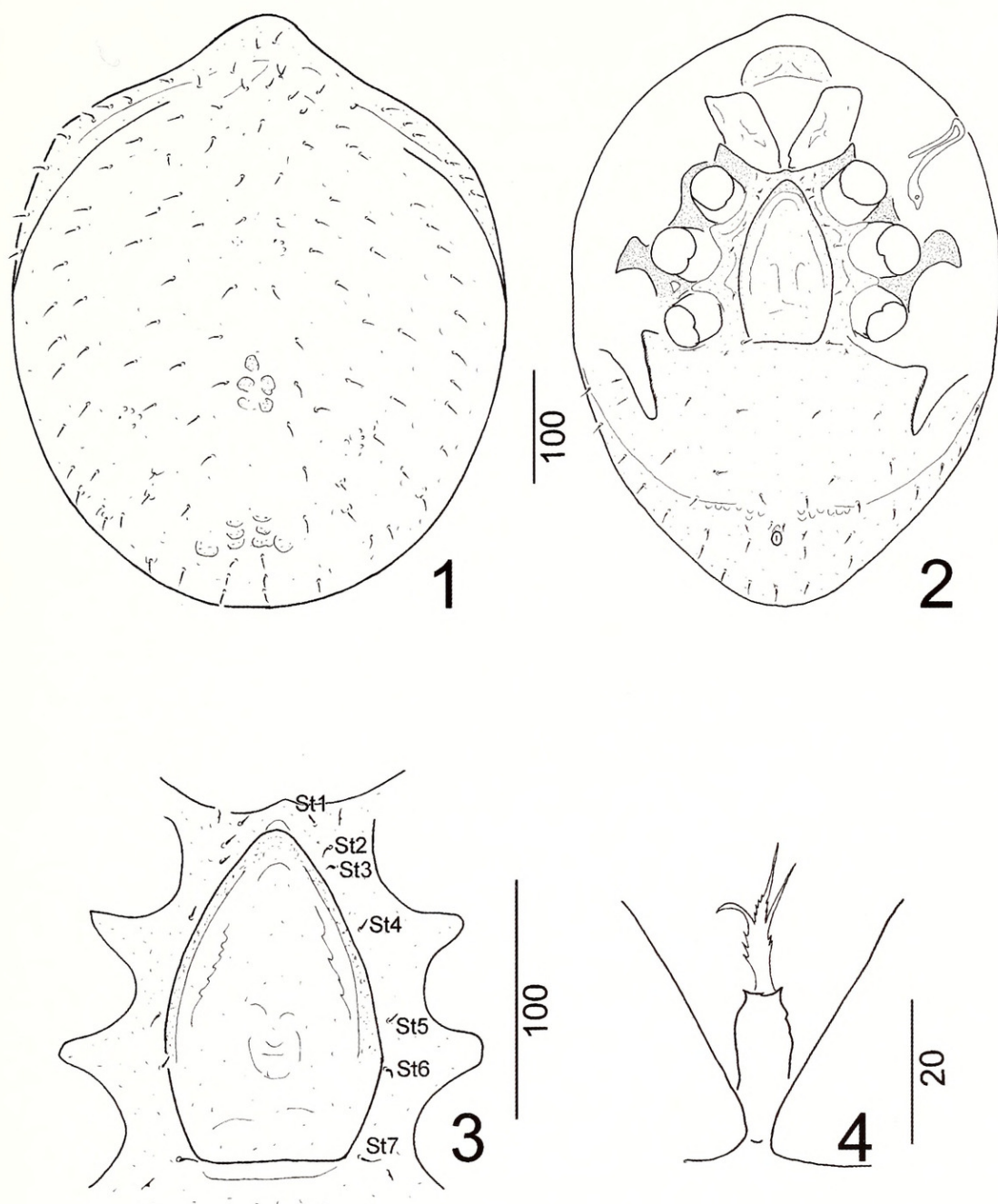
**PARATYPES:** MHNG, without registration number, two females and five males; HNHM, one female and two males; ISB, one female and two males. All with same data as for holotype.

**DIAGNOSIS:** All dorsal and marginal setae short and needle-like, dorsal, ventral and marginal shields without sculptural pattern. Genital shield of female scutiform, situated between coxae II and IV, with smooth surface. St1-St3 situated near anterior margin of genital shield of female. Metapodal lines weakly developed, ventral lines anteriorly reaching level of anal platelets.

**DESCRIPTION OF FEMALE:** Length of idiosoma 510-540  $\mu\text{m}$ , width 410-420  $\mu\text{m}$  ( $n=5$ ). Body shape oval, color reddish brown.

**Dorsal aspect of idiosoma** (Fig. 1): Dorsal and marginal shields fused anteriorly. All dorsal setae short (about 12-14  $\mu\text{m}$ ), smooth and needle like. Dorsal shield without sculptural pattern, several muscle impression present in central area of dorsal shield. Marginal shield smooth and bearing short (about 12-14  $\mu\text{m}$ ), needle-like setae.

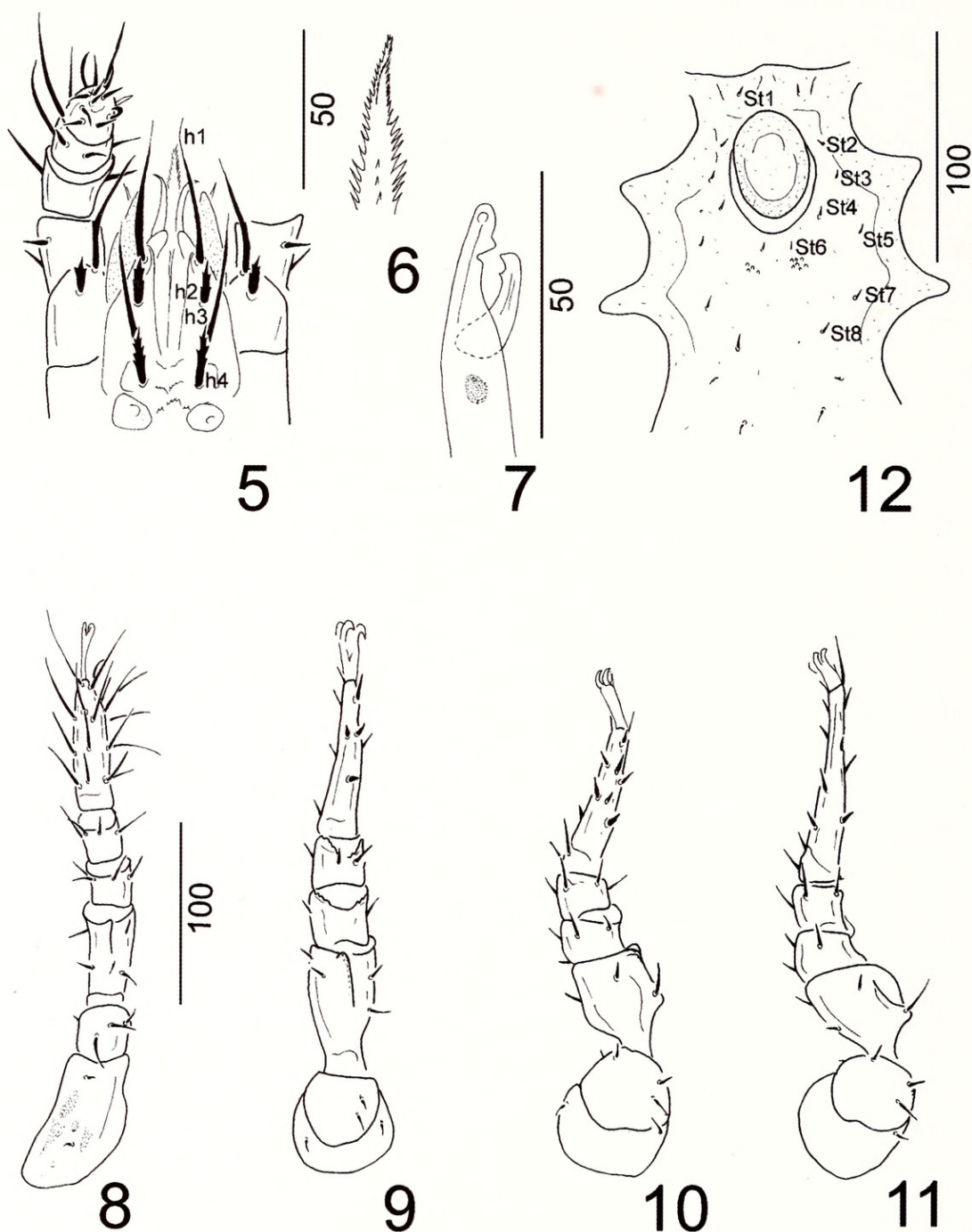
**Ventral aspect of idiosoma** (Fig. 2): Ornamentation of sternal shield absent, all sternal setae short (about 4-5  $\mu\text{m}$ ), smooth and needle-like. St1-St3 situated near anterior margin of genital shield, St4 at level of posterior margin of coxae II, St5 at level of posterior margin of coxae III, St6 at level of anterior margin of coxae IV, St7 near basal edges of genital shield (Fig. 3). Ventral shield smooth, several oval pits situated posteriorly near inner end of ventral lines. Ventral setae smooth, needle-like and short (about 8-9  $\mu\text{m}$ ), setae ad1 needle-like and about 4-5  $\mu\text{m}$  long. Four pairs of lyriform fissures present on ventral idiosoma, first pair of them situated near anterior margin of sternal shield, second pair near St7, third pair near margins of pedofossae, fourth pair at level of ad1. Stigmata situated between coxae II and III. Peritremes hook-shaped, poststigmatid part short. Genital shield of female scutiform, placed between coxae II and IV, without sculptural pattern and anterior process (Fig. 3). Pedofossae deep, their surface smooth, with separate furrows for tarsi IV, metapodal lines weakly developed. Base of tritosternum narrow, its laciniae trifurcate and its margins serrate (Fig. 4).



FIGS 1-4

*Uroobovella madagascariica* sp. n., female, holotype. (1) Body in dorsal view. (2) Body in ventral view. (3) Intercoxal area. (4) Tritosternum.

*Gnathosoma* (Fig. 5): Corniculi horn-like, internal malae longer than corniculi and smooth. Labrum marginally pilose. Hypostomal setae: h1 long (about 47  $\mu\text{m}$ ), smooth and setiform; h2 short (about 13  $\mu\text{m}$ ) and marginally serrate; h3 long (about 38  $\mu\text{m}$ ) and smooth; h4 long (about 16  $\mu\text{m}$ ) and marginally serrate. Epistome basally serrate and apically pilose (Fig. 6). Chelicerae with sclerotised internal nodes, fixed digit longer than movable digit, both digits bearing a single tooth each (Fig. 7).



FIGS 5-12

*Uroobovella madagascariensis* sp. n., female holotype (5-11) and male paratype (12). (5) Gnathosoma and palp in ventral view. (6) Epistome. (7) Chelicera in lateral view. (8) Leg I in ventral view. (9) Leg II in ventral view. (10) Leg III in lateral view. (11) Leg IV in lateral view. (12) Intercoxal area of male.

**Legs** (Figs 8-11): All legs bearing claws on tip of tarsi, legs I bearing needle-like setae on all segments, legs II-IV bearing short and robust setae on each tarsus and needle-like setae on all segments.

DESCRIPTION OF MALE: Length of idiosoma 480-520  $\mu\text{m}$ , width 390-410  $\mu\text{m}$  ( $n=9$ ). Shape of idiosoma, ornamentation and chaetotaxy of dorsal parts as in female. Sternal setae short (about 4-5  $\mu\text{m}$ ) and needle-like. St1 placed near anterior margin of sternal shield, St2-St4 near lateral margins of genital opening, St5 at level of central area of coxae III, St6 near posterior margin of genital shield, St7 and St8 at level of coxae IV. Sternal shield smooth, only some small oval pits situated posteriorly to St6. Sternal shield bearing two pairs of lyriform fissures, first pair situated near St1, second pairs at level of coxae IV. Genital shield oval and situated between coxae II and III (Fig. 12). Shape of ventral setae and ornamentation as in female.

Larva and nymphs unknown.

ETYMOLOGY: The name of the new species refers to the island where the specimens examined were collected.

REMARKS: The new species belongs to the *Uroobovella vinicolora*-group (Hirschmann, 1989) due to the shape of its peritremes, the number of sternal setae and the presence of claws on the tip of legs I. Up to now, ten species are known in this group, but two of them are known only from deutonymphs [*U. michiganensis* (Vitzthum, 1926) from the USA and *U. wichmanni* (Vitzthum, 1923) from India]. Three species (*U. neoamericana* Hirschmann in Hirschmann & Zirngiebl-Nicol, 1972; *U. feideri* Huřu, 1976 and *U. bucovensis* Huřu, 1976) have separated marginal shields in the posterior area of the dorsal idiosoma. In the other species (including the new one) the marginal shields are fused posteriorly.

One of the species in this group with posteriorly fused marginal shields (*U. erlangensis* Hirschmann & Zirngiebl-Nicol, 1962) has long j1 setae. These are similar in length and shape to other dorsal setae in the new species. The other two species with posteriorly fused marginal shields (*U. baloghi* Hirschmann & Zirngiebl-Nicol, 1962 and *U. vinicolora* (Vitzthum, 1926) have an ornamented ventral shield, whereas in the new species the ventral shield is smooth. The remaining two species [*U. bistellaris* (Vitzthum, 1935) and *U. rubra* Athias-Binche, 1983] have a smooth ventral shield as in the new species, but in the two previously described species the metapodal lines are well-developed and the ventral lines end at the level of the anal platelets, while in the new species the metapodal lines are weakly developed and the ventral lines end anteriorly to the anal platelets.

Two *Uroobovella* species (*U. madagascariensis* Wiřniewski & Hirschmann, 1992 and *U. pygorana* Wiřniewski & Hirschmann, 1992) were previously reported from Madagascar, but their adults are still unknown. The herein described new species is placed into the *Uroobovella vinicolora*-group. The two, previously known species from Madagascar belong to two different species groups [*Uroobovella madagascariensis* Wiřniewski & Hirschmann, 1992 to the *Uroobovella ipidis*-group and *U. pygorana* Wiřniewski & Hirschmann, 1992 to the *Uroobovella fracta*-group (Hirschmann, 1989)].

*Nenteria madagascarensis* sp. n.

Figs 13-25

HOLOTYPE: MHNG, without registration number; female; Madagascar, Nord, Montagne d'Ambre National Park, 1100m, litter sifting; 30.10.2010; leg. P. Bařař.

PARATYPES: MHNG, without registration number, one male; HNHM, one female and one male; ISB, one female and one male. All with same data as for holotype.

**DIAGNOSIS:** Dorsal shield with needle-like and marginally pilose dorsal setae, dorsal surface covered by large irregularly outlined and small oval pits. Genital shield of female scutiform, with V-like process on its anterior margin. Paralaciniae on gnathosoma longer and wider than internal malae.

**DESCRIPTION OF FEMALE:** Length of idiosoma 470-480  $\mu\text{m}$ , width 340-350  $\mu\text{m}$  (n=3). Body shape oval, color reddish brown.

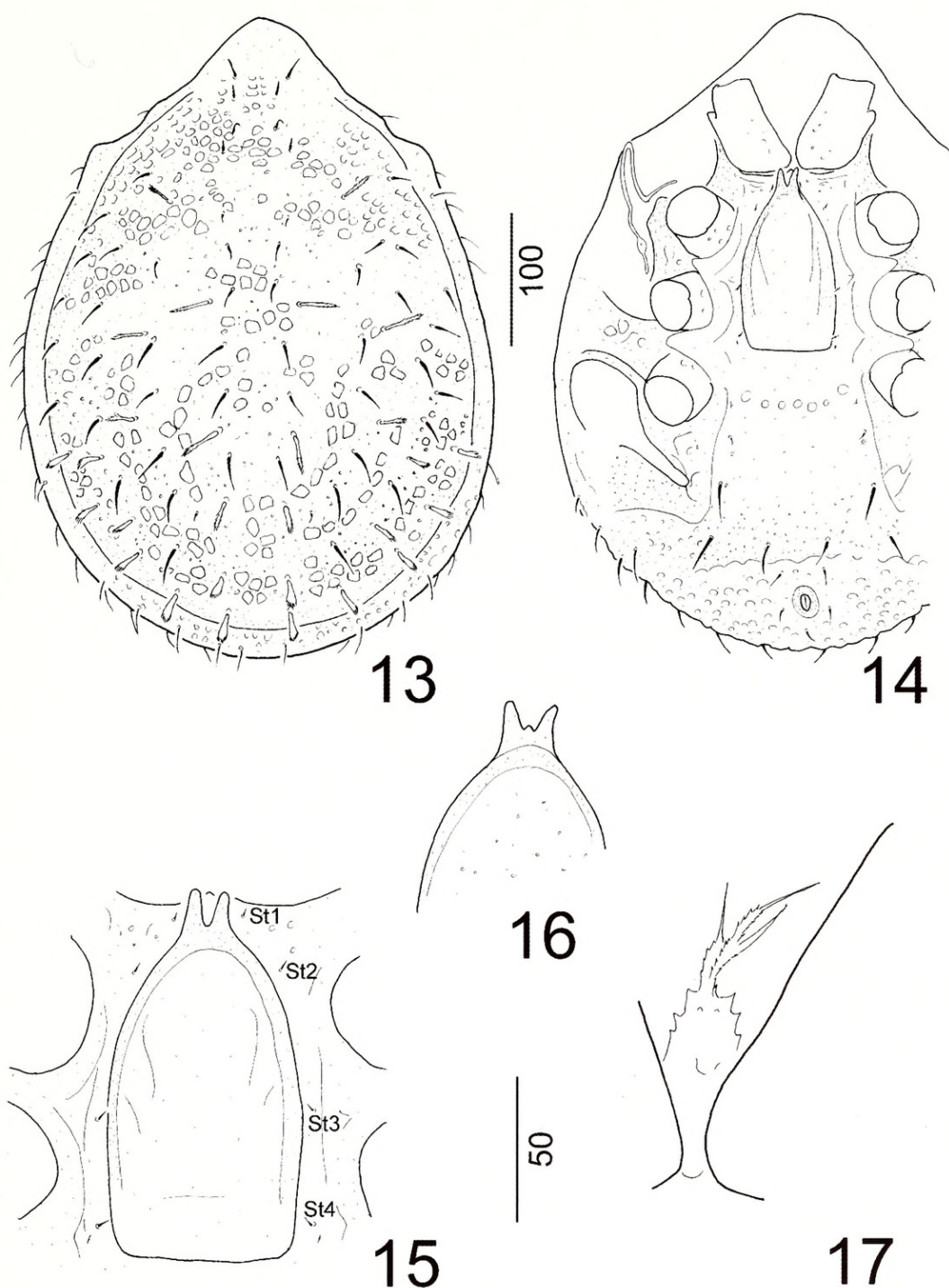
*Dorsal aspect of idiosoma* (Fig. 13): Dorsal and marginal shields fused anteriorly. Two types of dorsal setae present: first type long (about 14-18  $\mu\text{m}$ ) and marginally pilose, situated in central and caudal area. Second type smooth and needle-like, mostly long (about 14-15  $\mu\text{m}$ ), but some setae in row j short (about 6-7  $\mu\text{m}$ ). These smooth setae present all over dorsal shield, but most numerous in anterior area. Dorsal shield covered by large irregularly outlined and small oval pits. Surface of marginal shield with oval pits, marginal setae short (about 12-13  $\mu\text{m}$ ) smooth and needle-like.

*Ventral aspect of idiosoma* (Fig. 14): Sternal shield ornamented with small oval pits near its anterior margin, other areas of this shield smooth. All sternal setae short (about 3-4  $\mu\text{m}$ ), smooth and needle-like. St1 situated near anterior margin of sternal shield, S2-4 at level of anterior margin of coxae II, St3 at level of anterior margin of coxae III, St4 at level of posterior margin of coxae III (Fig. 15). Ventral shield smooth anteriorly, several oval pits situated between coxae IV, surface posterior to setae V2 covered by small and large oval pits. Ventral setae smooth, needle-like, V1 short (about 5  $\mu\text{m}$ ), other setae long (about 25-28  $\mu\text{m}$ ), adanal and postanal setae smooth, needle-like and about 12  $\mu\text{m}$  long. Two pairs of lyriform fissures present on ventral idiosoma, first pair of them situated near St4, second pair at level of coxae IV. Peritremes U-shaped, poststigmatid part short. Genital shield of female scutiform, placed between coxae II and III, without sculptural pattern and with V-shaped anterior process (Fig. 15), this process W-shaped in one paratype (Fig. 16). Pedofossae deep, their surface smooth, with separate furrows for tarsi IV, metapodal lines well developed. Base of tritosternum narrow, with serrate margins, laciniae trifurcate and marginally serrate (Fig. 17).

*Gnathosoma* (Fig. 18): Corniculi short, horn-like, internal malae longer than corniculi and smooth, paralaciniae longer and wider than internal malae. Hypostomal setae: h1 long (about 30  $\mu\text{m}$ ), smooth and setiform; h2 robust, smooth and short (about 11  $\mu\text{m}$ ); h3 (about 27  $\mu\text{m}$ ) and h4 (about 31  $\mu\text{m}$ ) long and marginally serrate. Epistome smooth, anterior margin rounded. Chelicerae with sclerotised internal nodes, fixed digit longer than movable digit, both digits bearing a single tooth (Fig. 19), palp with needle-like setae (Fig. 20).

*Legs* (Figs 21-24): All legs bearing claws on tip of tarsi, legs I bearing needle-like setae on all segments and one pilose seta on trochanter. Legs II-IV bearing short and robust setae on each tarsus and needle-like setae on all segments.

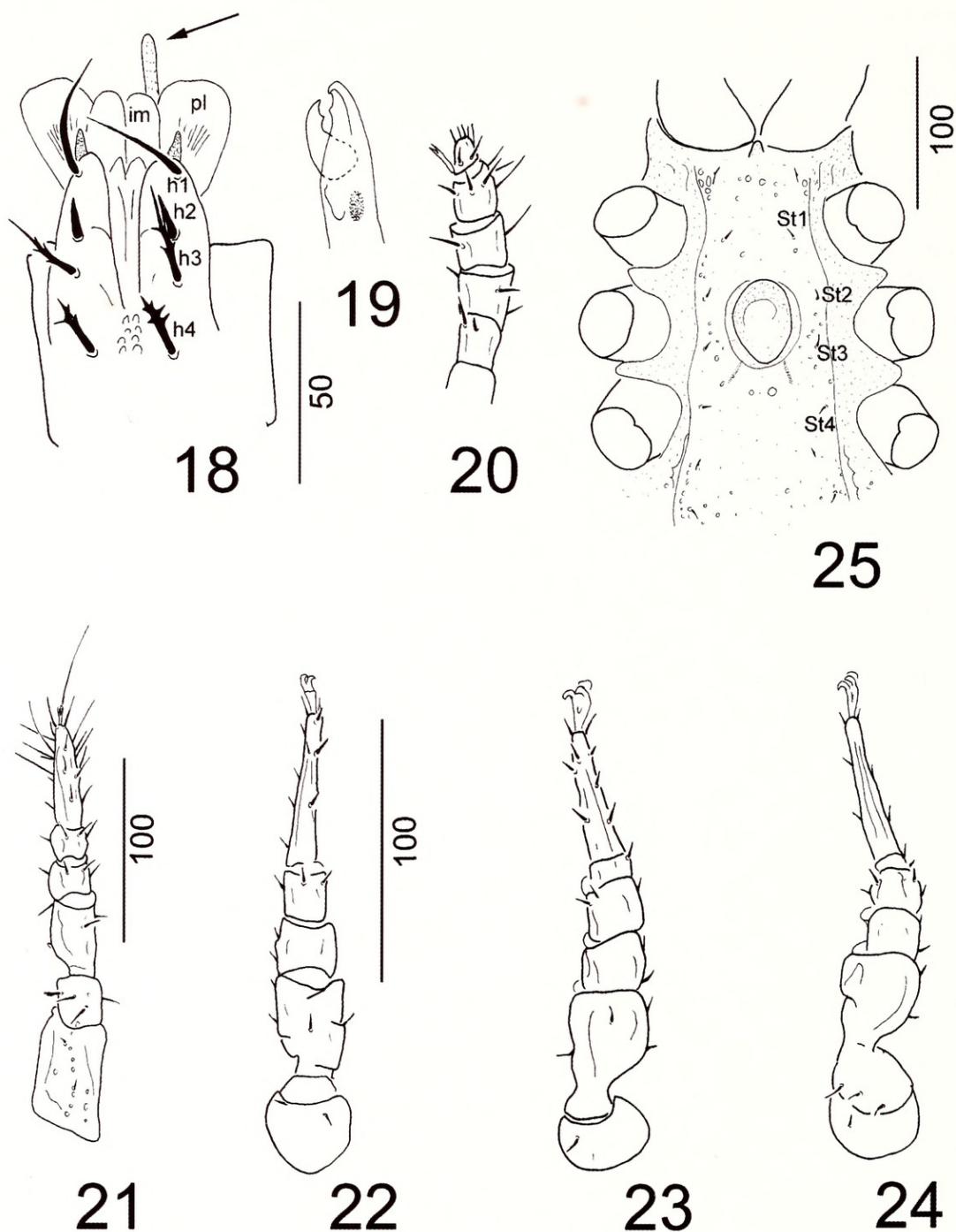
**DESCRIPTION OF MALE:** Length of idiosoma 470-480  $\mu\text{m}$ , width 340-350  $\mu\text{m}$  (n=3). Shape of idiosoma, ornamentation and chaetotaxy of dorsal parts as in female. Sternal setae short (about 6-7  $\mu\text{m}$ ) and needle-like, St1 situated at level of central region of coxae II, St2 and St3 near lateral margin of genital opening, St4 at level of



FIGS 13-17

*Nenteria madagascarensis* sp. n., female holotype (13-15, 17) and female paratype (16). (13) Body in dorsal view. (14) Body in ventral view. (15) Intercoxal area. (16) Apical process on genital shield of different specimen. (17) Tritosternum.

central area of coxae IV. Sternal shield covered by some oval pits. Sternal shield bearing two pairs of lyriform fissures, first pair of them situated near anterior margin of sternal shield, second pair at level of posterior margins of coxae IV. Genital shield oval and situated between coxae III (Fig. 25).



FIGS 18-25

*Nenteria madagascarensis* sp. n., female holotype (18-24) and male paratype (25). (18) Gnathosoma in ventral view (arrow indicating apical part of epistome). (19) Chelicera in lateral view. (20) Palp in ventral view. (21) Leg I in ventral view. (22) Leg II in ventral view. (23) Leg III in ventral view. (24) Leg IV in ventral view. (25) Intercoxal area of male.

Ventral setae and ornamentation as in female.

Larva and nymphs unknown.

ETYMOLOGY: The name of the new species refers to the island where the specimens examined were collected.

REMARKS: Although the new species possesses several unusual characters, it is placed in the genus *Nenteria* Oudemans, 1915 due to the presence of paralaciniae and due to the shape of the tritosternum and of the processes of the gnathosoma.

The dorsal ornamentation, the shape of the dorsal setae, the shape of internal malae and paralaciniae of the new species were up to now unknown for the widely distributed genus *Nenteria*.

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