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(Acari: Phytoseiidae) from sub-Saharan Africa**

EDWARD A. UECKERMANN, IGNACE D. ZANNOU,  
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## Phytoseiid mites of the tribe Typhlodromini (Acari: Phytoseiidae) from sub-Saharan Africa

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### Table of contents

Abstract .....	5
Introduction .....	5
Typhlodromini Wainstein .....	6
<i>Typhlodromu</i> Scheuten .....	6
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) DeLeon .....	7
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>acaciae</i> Schultz .....	7
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>apoxys</i> Van der Merwe.....	9
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>argyronamus</i> Ueckermann & Loots .....	12
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>asperosetosus</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	12
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>astibus</i> Ueckermann & Loots .....	15
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>asticus</i> El-Banhawy & Abou-Awad .....	17
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>auratus</i> Ueckermann & Loots .....	17
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>balanites</i> El-Badry .....	19
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>bergi</i> Moraes & McMurtry .....	19
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>buccalis</i> Van der Merwe .....	21
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>bullatus</i> Van der Merwe.....	23
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>capparidis</i> Van der Merwe .....	25
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>celastrus</i> Ueckermann & Loots .....	25
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>cephalochaitosus</i> Moraes, Oliveira & Zannou .....	27
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>combretum</i> McMurtry & Moraes .....	27
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>constrictus</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	28
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>crassus</i> Van der Merwe .....	29
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>daresalaami</i> El-Banhawy & Abou-Awad .....	31
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>denheyeri</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	33
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>drymis</i> Ueckermann & Loots .....	35
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>elaeis</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	38
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>eremicus</i> Meyer & Ueckermann .....	38
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>februs</i> Van der Merwe .....	40
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>galpinii</i> Ueckermann, Zannou & Moraes, <b>n. sp.</b> .....	40
<i>Typhlodromu</i> ( <i>Anthoseius</i> ) <i>gardeniae</i> Schultz .....	43

<i>Typhlodromu (Anthoseius) ghanaensis</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	45
<i>Typhlodromu (Anthoseius) grastis</i> Ueckermann & Loots .....	48
<i>Typhlodromu (Anthoseius) grewiae</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	48
<i>Typhlodromu (Anthoseius) hartlandrowei</i> Evans .....	50
<i>Typhlodromu (Anthoseius) incisivus</i> Van der Merwe .....	52
<i>Typhlodromu (Anthoseius) johanna</i> e Ueckermann & Loots .....	54
<i>Typhlodromu (Anthoseius) kenya</i> e Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	57
<i>Typhlodromu (Anthoseius) kikuyuensis</i> Swirski & Ragusa .....	57
<i>Typhlodromu (Anthoseius) lobatus</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	59
<i>Typhlodromu (Anthoseius) lootsi</i> Schultz .....	61
<i>Typhlodromu (Anthoseius) malawiensis</i> Zannou, Moraes & Hanna .....	63
<i>Typhlodromu (Anthoseius) matthyssei</i> Ueckermann & Loots .....	63
<i>Typhlodromu (Anthoseius) michaeli</i> Ueckermann & Loots .....	65
<i>Typhlodromu (Anthoseius) microbullatus</i> Van der Merwe .....	67
<i>Typhlodromu (Anthoseius) muliebris</i> Van der Merwe .....	69
<i>Typhlodromu (Anthoseius) namaquaensis</i> Ueckermann & Loots .....	71
<i>Typhlodromu (Anthoseius) ndibu</i> Pritchard & Baker .....	73
<i>Typhlodromu (Anthoseius) neogutierrez</i> i Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	73
<i>Typhlodromu (Anthoseius) neohartlandrowei</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	75
<i>Typhlodromu (Anthoseius) neoterrulentis</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	79
<i>Typhlodromu (Anthoseius) paganus</i> Van der Merwe .....	80
<i>Typhlodromu (Anthoseius) persianus</i> McMurtry .....	83
<i>Typhlodromu (Anthoseius) praeacutus</i> Van der Merwe .....	85
<i>Typhlodromu (Anthoseius) rasilis</i> Van der Merwe .....	87
<i>Typhlodromu (Anthoseius) religiosus</i> Ueckermann & Loots .....	89
<i>Typhlodromu (Anthoseius) saevus</i> Van der Merwe .....	91
<i>Typhlodromu (Anthoseius) subtilis</i> Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	93
<i>Typhlodromu (Anthoseius) sudanicus</i> El-Badry .....	95
<i>Typhlodromu (Anthoseius) terrulentis</i> Van der Merwe .....	95
<i>Typhlodromu (Anthoseius) theroni</i> Ueckermann & Loots .....	97
<i>Typhlodromu (Anthoseius) totifolianensis</i> El-Banhawy & Abou-Awad .....	99
<i>Typhlodromu (Anthoseius) transvaalensis</i> (Nesbitt) .....	99
<i>Typhlodromu (Anthoseius) umbraculus</i> Ueckermann & Loots .....	101
<i>Typhlodromu (Anthoseius) vescus</i> Van der Merwe .....	102
<i>Typhlodromu (Anthoseius) werneri</i> Schultz .....	105
<i>Typhlodromu (Anthoseius) wrenschae</i> Ueckermann & Loots .....	105
<i>Typhlodromu (Typlodromu) Scheuten</i> .....	108
<i>Typhlodromu (Typlodromu) griekwensis</i> Schultz .....	108
<i>Typhlodromu (Typlodromu) magdalena</i> e Pritchard & Baker .....	111
<i>Typhlodromu (Typlodromu) neomagdalena</i> e Zannou, Moraes & Oliveira, <b>n. sp.</b> .....	113
Key to subgenera and species of the tribe Typhlodromini treated in this paper .....	115
Acknowledgements .....	119
References .....	119

## Abstract

This is the ninth publication in a series on the taxonomy of phytoseiid mites of sub-Saharan Africa. Sixty-five phytoseiid species of the tribe Typhlodromini Wainstein, all of which are in the genus *Typhlodromus* Scheuten are reported in this paper (62 in the subgenus *Anthoseius* DeLeon and 3 in the subgenus *Typhlodromus* Scheuten). They refer to all species of this tribe known to occur in sub-Saharan Africa. Fifteen new species are described and 41 species are redescribed. Most of the reported species were collected in various habitats in southern Africa and in cassava habitats in tropical Africa. A key is included for the separation of these species.

**Key words:** Biological control, predator, Phytoseiidae, cassava, taxonomy, *Typhlodromus*

## Introduction

This paper is the ninth in a series dealing with the determination of sub-Saharan African phytoseiid mites. The first six papers dealt with species of the Amblyseiinae (Moraes *et al.* 2001b; Moraes *et al.* 2006; Moraes *et al.* 2007a, 2007b; Zannou *et al.* 2006, 2007), the seventh with species of the Phytoseiinae (Ueckermann *et al.* 2007), and the eighth with species of the Paraseiulini (Moraes *et al.* 2008).

The whole series, including the present paper, refers to all species currently reported from sub-Saharan Africa, with information on morphological variation of the species that have been recollected in surveys conducted in South Africa by South African professionals and in other countries by personnel of the International Institute of Tropical Agriculture. In the latter case, surveys were conducted within the scope of an extensive project for the biological control of the cassava green mite [*Mononychellus tanajoa* (Bondar)] in Africa (Yaninek 1988; Yaninek & Herren 1988; Yaninek & Hanna 2003). The main objective of those surveys was to evaluate the composition of the phytoseiid fauna in cassava fields and on the surrounding vegetation, before and after the introduction of exotic phytoseiids from the Neotropics for control of the pest. The objective of the present paper is to report on the phytoseiid mites of the tribe Typhlodromini Wainstein, known from sub-Saharan Africa with redescriptions of known species and descriptions of new species based on specimens found in this study. A key is provided to allow the identification of all the species of this tribe known from sub-Saharan Africa.

Species in this present study found in association with web producing spider mites are: *T. (A.) hartlandrowei* (Evans) (*Tetranychus neocaledonicus* André), *T. (A.) johannae* Ueckermann & Loots (Tetranychidae), *T. (A.) saevus* Van der Merwe (amongst others *Mononychelus lippiae* Meyer), *T. (A.) ndibu* Pritchard & Baker (*T. neocaledonicus*, *Tetranychus* sp and *Eutetranychus* sp.), *T. (A.) paganus* Van der Merwe (amongst others *T. gardeniae* Meyer), *T. (A.) praeacutus* Van der Merwe [amongst others *Eutetranychus orientalis* (Klein)] and *T. (A.) persianus* McMurtry [was reared on *T. pacificus* (McGregor)].

Setal nomenclature is that of Rowell *et al.* (1978) and Chant & Yoshida-Shaul (1991) for dorsal and ventral surfaces of the idiosoma, respectively. Idiosomal setal patterns used here are those of Chant & Yoshida-Shaul (1992). All measurements are given in micrometres; each measurement corresponds to the average for the number of individuals indicated for each sex of each species followed (in parentheses) by the respective ranges (if measurement is variable). For some of the redescribed species, measurements of type specimens are provided; in those cases, if measurements of specimens collected in this study are also provided, then the measurements of the types are shown in square brackets. Dorsal shield width was always taken at the widest level of the proscutum, and the ventrianal shield width at level of anus was always taken at the middle part of the anus. Macrosetae for which measurements are not provided should be considered as absent. Abbreviations used for depositories of type specimens are: ESALQ-USP (Escola Superior de Agricultura “Luiz de Queiroz”, Universidade de São Paulo, Piracicaba-SP, Brazil); IITAIM (International Institute of Tropical Agriculture Insect Museum, Cotonou, Republic of Benin) and NCA-PPRI (National Collection of Arachnida, PPRI, Pre-

toria, South Africa). World distribution of each species is based on the surveys corresponding to the present work, on Moraes *et al.* (2004) and Zannou *et al.* (2005).

## **Typhlodromini Wainstein**

Typhlodromini Wainstein, 1962: 26; Chant & McMurtry, 1994: 246; 2007: 144.

*Typhlodromus* Scheuten, Evans, 1953: 449.

*Typhlodromus* (*Typhlodromus*), Chant, 1957: 528.

Chant & McMurtry (1994, 2007) gave a full description of the tribe Typhlodromini, mentioning the following as key characters to separate it from other tribes of the Typhlodrominae: presence of setae z3 [absent in one of the *Typhlodromus* (*Anthoseius*) species here described], s6, J2, S2, R1, JV2 and ZV3; absence of setae z6, J1 and Z3; presence of setae S4 and JV4 in most species; variable occurrence of setae Z1, S5, JV3 and JV4; 5 dorsal setal patterns: 12A:9B with seta Z1 present, 12A:8A with seta Z1 absent, 12A:7A with setae Z1 and S5 absent, 12A:7B with setae Z1 and S4 absent and 11D:8A with z3 and Z1 absent. Of the 3 genera placed by Chant & McMurtry (1994, 2007) in this tribe, only *Typhlodromus* has been reported from sub-Saharan Africa.

## ***Typhlodromus* Scheuten**

*Typhlodromus* Scheuten, 1857: 111; Chant & McMurtry, 1994: 249; 2007: 147; Moraes *et al.*, 2004: 307.

*Kampimodromus* Nesbitt, 1951: 52 (in part).

*Typhlodromus* (*Typhlodromus*), Chant, 1957: 528 (in part).

*Typhlodromus rhenanus* group, Chant, 1959: 62.

*Typhlodromus barkeri* group, Chant, 1959: 60.

*Anthoseius* DeLeon, 1959: 258.

*Amblydromella* Muma, 1961: 294.

*Clavidromus* Muma, 1961: 296.

*Typhlodromella* Muma, 1961: 299.

*Chanteius* (*Colchodromus*) Wainstein, 1962: 19.

*Typhlodromus* (*Neoseiulus*), Wainstein, 1962: 21 (in part).

*Mumaseius* DeLeon, 1965: 23.

*Orientiseius* Muma & Denmark, 1968: 238.

*Typhlodromus* (*Anthoseius*) Van der Merwe, 1968: 20.

*Indodromus* Ghai & Menon, 1969: 348.

*Wainsteinius* Arutunjan, 1969: 180; Karg, 1983: 300.

*Anthoseius* (*Amblydromellus*) Wainstein, 1972: 1477; Karg, 1983: 323 (in part).

*Anthoseius* (*Anthoseius*) Wainstein, 1972: 1477.

*Anthoseius* (*Aphanoseius*) Wainstein, 1972: 1478; Karg, 1983: 323.

*Anthoseius* (*Indodromus*) Wainstein, 1972: 1477.

*Berethria* Tuttle & Muma, 1973: 35.

*Vitoseius* Kolodochka, 1988: 42; Kolodochka, 1998: 60.

*Typhlodromus* (*Trionus*) Denmark, 1992: 32.

*Typhlodromus* (*Oudemanus*) Denmark, 1992: 34.

*Anthoseius* (*Litoseius*) Kolodochka, 1992: 22.

Chant & McMurtry (1994, 2007) gave full descriptions of *Typhlodromus*. Key characters used to separate this from other genera of the same tribe are: dorsal setal patterns 12A:8A (the most common, with Z1 absent), 12A:7A (with Z1 and S5 absent), 12A:7B [with *T. (Anthoseius) arizonicus* (Tuttle & Muma) and *T. (A.) demoraesi* Lofego & Feres, with Z1 and S4 absent) and 11D:8A (with *T. (A.) cephalochaitosus* Moraes, Oliveira & Zannou, with z3 absent); caudoventral setal patterns of females JV:ZV, JV-3:ZV or JV-4:ZV; with 33-35 pairs of idiosomal setae in total; dorsal setae z3 (absent in *Typhlodromus cephalochaitosus*), s6, J2, S2, and R1, and

caudoventral setae JV2 and ZV3 present; dorsal setae z6, J1, Z1 and Z3 absent; dorsal setae S4 and S5, and caudoventral setae JV3 and JV4 present/absent; morphology of the dorsal setae, cheliceral dentition, morphology of the spermatheca and leg setation considerably variable. The two subgenera recognized by Chant & McMurtry (1994) were reported from sub-Saharan Africa.

### ***Typhlodromus (Anthoseius) DeLeon***

*Anthoseius* DeLeon, 1959: 257; Muma, 1961: 296; Muma *et al.*, 1970: 140; Kolodochka, 1998: 61; Denmark & Welbourn, 2002: 305.

*Typhlodromus rhenanus* group, Chant, 1959: 62.

*Typhlodromus barkeri* group, Chant, 1959: 60.

*Amblydromella* Muma, 1961: 294; Muma, 1967: 276; Denmark & Muma, 1973: 269; Chaudhri *et al.*, 1974: 208; Denmark & Welbourn, 2002: 293.

*Clavidromus* Muma, 1961: 296.

*Typhlodromella* Muma, 1961: 299.

*Chanteius (Colchodromus)* Wainstein, 1962: 19.

*Mumaseius* DeLeon, 1965: 23.

*Orienteisus* Muma & Denmark, 1968: 238; Muma *et al.*, 1970: 141.

*Typhlodromus (Anthoseius)* Van der Merwe, 1968: 20; Karg, 1982: 194; Chant & McMurtry, 1994: 250; Moraes *et al.*, 2004: 307; Chant & McMurtry, 2007: 149.

*Indodromus* Ghai & Menon, 1969: 348.

*Anthoseius (Amblydromellus)* Wainstein, 1972: 1477; Karg, 1983: 323.

*Anthoseius (Anthoseius)* Wainstein, 1972: 1477; Karg, 1983: 322.

*Anthoseius (Aphanoseius)* Wainstein, 1972: 1478.

*Berethria* Tuttle & Muma, 1973: 35.

*Vittoseius* Kolodochka, 1988: 42 (synonymy by Chant & McMurtry, 1994).

*Anthoseius (Litoseius)* Kolodochka, 1992: 22.

*Anthoseius (Amblydromella)*, Denmark & Welbourn, 2002: 305.

According to Chant & McMurtry (1994, 2007), the species in the subgenus *Anthoseius* are characterized by: presence of seta S5; 3 dorsal setal patterns: 12A:8A (the most common), 12A:7B [with *T. (A.) arizonicus* and *T. (A.) demoraesi*] and 11D:8B [with *T. (A.) cephalochaitosus*]; caudoventral setal pattern of females JV:ZV (the most common), JV-3:ZV (in 25 species) or JV-4:ZV [with *T. (A.) arizonicus* and *T. (A.) demoraesi*; both species are included in this subgenus, despite the absence of setae S4 and JV4; the absence of those setae was considered by Chant & McMurtry (1994, 2007) as apomorphic character states shared with the species in the tribes Typhloseiopsini and Metaseiulini].

Sixty-two species of this subgenus are reported in this paper. Females of these species have 2 pairs of sternal pores; a pair of pre-anal pores except *Typhlodromus (A.) argyronamus* Ueckermann & Loots, *Typhlodromus (A.) lootsi* Schultz, *Typhlodromus (A.) namaquaensis* Ueckermann & Loots and *Typhlodromus (A.) wernerii* Schultz, in which they are absent, and JV4, JV5, ZV1 and ZV3 present.

### ***Typhlodromus (Anthoseius) acaciae* Schultz**

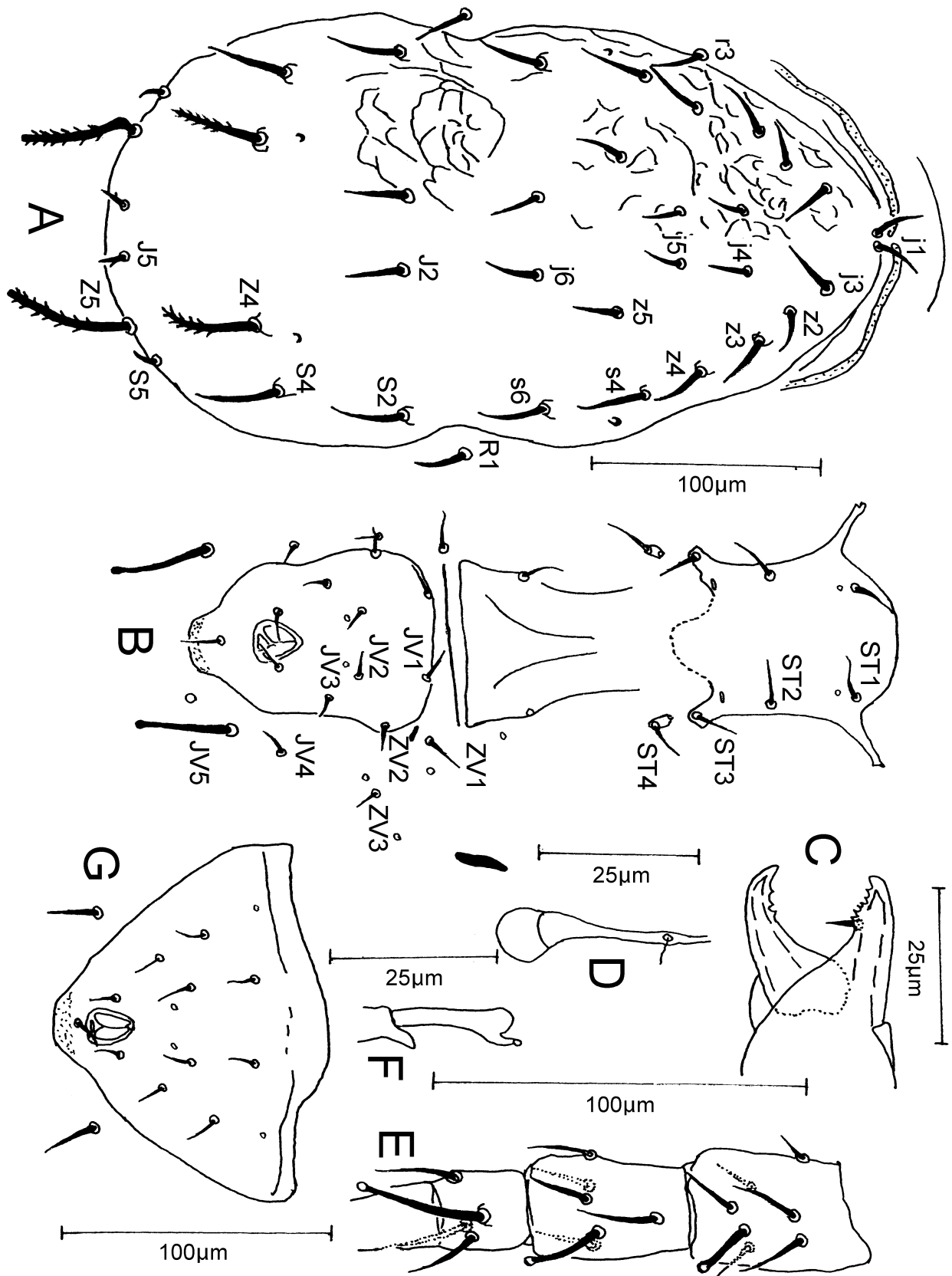
(Fig. 1)

*Typhlodromus (Anthoseius) acaciae* Schultz, 1973: 103; Moraes *et al.*, 2004: 308; Chant & McMurtry, 2007: 152.

*Amblydromella acaciae*, Moraes *et al.*, 1986: 154.

*Amblydromella (Amblydromella) acaciae*, Denmark & Welbourn, 2002: 307.

FEMALE. (Specimens measured—South Africa: holotype, 1 paratype and 7 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.



**FIGURE 1.** *Typhlodromus (Anthoseius) acaciae* Schultz: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.



Dorsum. Dorsal shield 341 (324–352) [331] long and 179 (157–193) [177] wide; reticulate between j1 and S4, prodorsum also with line ornamentations and irregular reticulations. With 5 pairs of solenostomes, one pair lateral to setae j4 and j5 (gd2), one pair lateral to setae s4 and s6 (gd4), one pair posterolateral to s6 (gd6), one pair anterior to setae Z4 (gd8) and one associated with S5 (gd9). Setae j1 21 (21–26) [22], j3 28 (25–31) [25], j4 19 (16–21) [16], j5 19 (17–21) [17], j6 23 (21–25) [22], J2 25 (23–29) [24], J5 10 (8–15) [15], z2 21 (19–22) [19], z3 25 (22–29) [24], z4 27 (24–30) [26], z5 21 (18–22) [18], Z4 45 (42–50) [40], Z5 57 (54–62) [55], s4 29 (23–32) [23], s6 33 (28–38) [28], S2 36 (32–40) [32], S4 36 (32–41) [34], S5 12 (11–13) [12], r3 25 (23–27) [26], R1 25 (22–30) [23]. Setae smooth and sharp-tipped, except Z4, serrate, and Z5, serrate and knobbed; most of lateral setae and Z4 inserted on tubercles.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a median lobe; distances between ST1–ST3 65 (63–68) [64], ST2–ST2 55 (52–58) [52]. Genital shield smooth; distance between ST5–ST5 59 (53–64) [54]. Ventrianal shield pentagonal, smooth, with anterior margin straight, 115 (106–122) [106] long, 77 (73–84) [78] wide at level of ZV2, 70 (64–77) [64] wide at level of anus, with 4 pairs of pre-anal setae; round pre-anal pores posteromesad of JV2. With 1 pair of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 26 (24–26) [26] long, with 3 teeth; fixed digit 24 (23–25) [24] long, with 6 teeth.

Spermatheca. Calyx tubular, gradually flaring toward vesicle, 21 (18–23) [20] long; atrium small, incorporated in calyx.

Legs. Macrosetae knobbed; Sge IV 16 (15–18) [16], Sti IV 22 (19–24) [21], St IV 34 (31–35) [32]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 2)

Dorsum. Dorsal shield pattern and setae as in female, 259 (253–265) long and 155 (153–157) wide. Setae j1 19, j3 22, j4 16, j5 15 (14–16), j6 17 (15–18), J2 18 (17–19), J5 9 (8–9), z2 17 (16–17), z3 19 (18–20), z4 21, z5 17 (16–17), Z4 30, Z5 36, s4 23 (21–24), s6 24 (23–24), S2 23 (20–25), S4 24, S5 9, r3 22 (21–22), R1 17.

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, smooth, free from peritrematal shields, 101 (96–105) long, 138 (135–140) wide at the anterior corners; with 4 pairs of pre-anal setae and 1 pair of distinguishable lyrifissures (anterolateral and almost in horizontal line with JV1); pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Round distally with small tea-pot spout laterally, shaft 19 long.

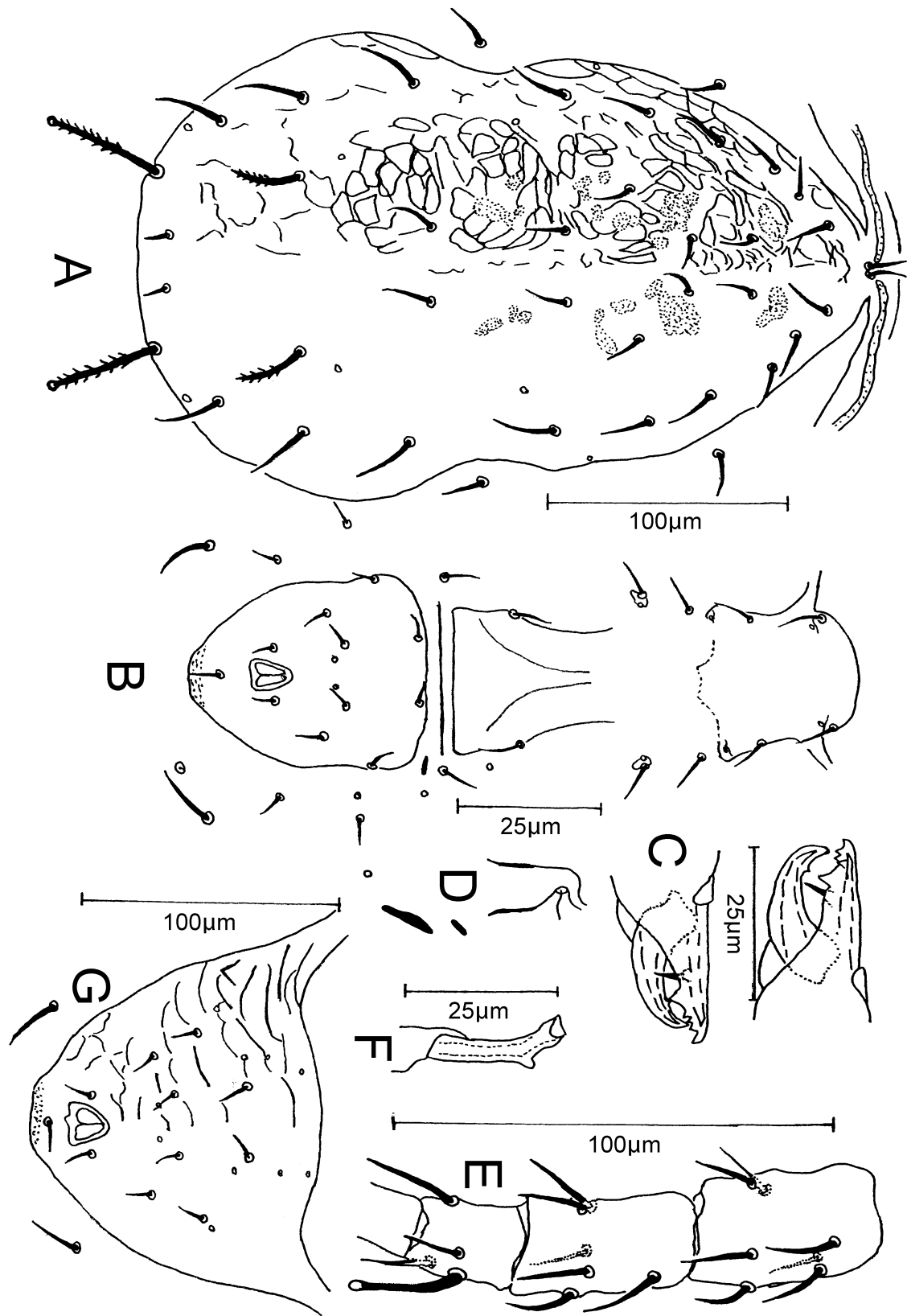
Legs. Macrosetae knobbed; Sge IV 12, Sti IV 19 (18–19), St IV 23 (20–26). Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** holotype and 1 paratype female, Gauteng Province, Roodeplaat, near Pretoria, on *Acacia* sp., 8-II-1972, F.W. Schultz; 1 female and 2 males, Limpopo Province, Swartkrans near Mokopane, on *Euclea crispa*, 5-V-1981, E. Kassimatis; 1 female, Gauteng Province, Roodeplaat near Pretoria, on *Maytenus heterophylla*, 15-I-1980, L. Seife; 1 female, Gauteng Province, Roodeplaat near Pretoria, on *Rhus pyroides*, 15-I-1980, M.K.P. Smith Meyer; 1 female, Gauteng Province, Roodeplaat near Pretoria, on *Grewia flava*, 15-I-1980, L. Seife; 2 females, Gauteng Province, Cullinan, on *Acacia* sp., 16-VII-1969, T. Coates.

**World distribution.** South Africa.

***Typhlodromus (Anthoseius) apoxys* Van der Merwe**  
(Fig. 2)

*Typhlodromus (Anthoseius) apoxys* Van der Merwe, 1968: 31; Moraes *et al.*, 2004: 309; Chant & McMurtry, 2007: 152.



**FIGURE 2.** *Typhlodromus (Anthoseius) apoxys* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male— F. Spermatodactyl; G. Ventrianal shield.

*Amblydromella apoxys*, Moraes *et al.*, 1986: 154.

*Amblydromella (Aphanoseia) apoxys*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 2 paratypes and 9 additional specimens). Idiosomal setal pattern 12A:8A/JV: ZV.

Dorsum. Dorsal shield 309 (298–318) [313] long and 168 (159–180) [169] wide; reticulate. With 5 pairs of solenostomes same arrangement as in *T. (A.) acaciae*. Setae j1 17 (15–20) [16], j3 19 (16–22) [21], j4 15 (13–19) [16], j5 15 (13–16) [15], j6 16 (12–18) [18], J2 21 (16–24) [22], J5 10 (8–13) [10], z2 16 (14–18) [15], z3 19 (16–22) [18], z4 19 (15–23) [23], z5 17 (14–18) [17], Z4 28 (25–32) [31], Z5 43 (39–46) [47], s4 20 (19–22) [22], s6 23 (20–26) [26], S2 26 (22–29) [27], S4 28 (23–31) [31], S5 27 (23–31) [31], r3 19 (16–23) [17], R1 18 (15–22) [20]. Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin with median lobe; distances between ST1–ST3 55 (51–64) [64], ST2–ST2 48 (47–50) [48]. Genital shield smooth; distance between ST5–ST5 50 (48–54) [50]. Ventrianal shield pentagonal, smooth, with anterior margin almost straight, 90 (95–104) [104] long, 73 (72–85) [85] wide at level of ZV2, 77 (72–80) [78] wide at level of anus, with 4 pairs of pre-anal setae; round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 22 (20–25) [25] long, with 1 tooth; fixed digit 20 (19–20) [20] long, with 4 teeth (not 3 as in Van der Merwe, 1968).

Spermatheca. Calyx bell-shaped, short and broad, 11 (9–12) [10] long.

Legs. Macroseta knobbed on most specimens, sharp-tipped in some; St IV 18 (16–20). Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1- (2, 2)/0-1.

MALE. (Specimens measured—South Africa: 2)

Dorsum. Dorsal shield pattern and setae as in female, 238 (234–242) long and 149 (147–150) wide. Setae j1 15 (14–15), j3 17 (16–17), j4 11 (9–13), j5 12 (11–13), j6 14 (13–14), J2 15 (14–16), J5 9, z2 13 (12–14), z3 15 (13–16), z4 17 (16–17), z5 14 (13–14), Z4 20 (19–21), Z5 31 (29–31), s4 18 (17–18), s6 19 (15–22), S2 19 (18–19), S4 20 (19–20), S5 19 (18–20), r3 18, R1 16.

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, reticulate, fused with peritrematal shields, 96 (93–98) long, 121 (116–125) wide at the anterior corners; with 4 pairs of pre-anal setae and 4 pairs of lyrifissures (2 anterior to JV1, 1 lateral and slightly posterior to JV1 and 1 lateral and anterior to ZV2); round pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Slightly bent distally with a process on the curved region, shaft 24 (23–25) long.

Legs. Macroseta knobbed on most specimens, sharp-tipped in some; St IV 15. Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype and 1 paratype female, Kwazulu/Natal Province, Munster, on an unidentified shrub, 19-XI-1955, M.K.P. Smith Meyer; 1 paratype female, Eastern Cape Province, East London, on *Diospyros dichrophylla*, 16-I-1965, G.G. van der Merwe; 1 paratype female, Limpopo Province, Kruger National Park, on *Combretum imberbe*, 13-I-1964, P. Jordaan; 1 female, Limpopo Province, Gravelotte, on *C. imberbe*, 25-V-1983, M.K.P. Smith Meyer; 1 female, Western Cape Province, Uilekraal River Mouth near Gansbaai, on *Chrysanthemoides monilifera* subsp. *pisifera*, 10-III-1983, D.P. Keetch; 1 female, Limpopo Province, Die Eiland (The Island), on *Achyropsis leptostachya*, 25-V-1983, M.K.P. Smith Meyer; 1 female Mpumalanga Province, ZASM-Tunnel near Waterval Boven, on an unidentified plant, 22-I-1986, M.K.P. Smith Meyer; 1 female, Limpopo Province, Moria, on an unidentified plant, 24-V-1983, M.K.P. Smith Meyer; 1 female, Kwazulu/Natal, Leisure Bay, on *Pastinaca rigida*, 5-IX-1996, E.A. Ueckermann; 1 male and 1 female, Western Cape Province, on an unidentified plant, 26-I-1994, E. van den Berg; 1 male,

Mpumalanga Province, Sabie, on *Bowkeria cymosa*, 22-V-1992, S. Nesor; 1 female, Mpumalanga Province, Mbotsweni near White River, on unidentified shrub, 25-III-1996, E.A. Ueckermann.

**Remarks.** In some specimens, genu IV bears a knobbed seta 10-14 [13] long.

**World distribution.** South Africa and Mozambique.

### *Typhlodromus (Anthoseius) argyronamus* Ueckermann & Loots

(Fig. 3)

*Typhlodromus (Anthoseius) argyronamus* Ueckermann & Loots 1988: 45; Moraes *et al.*, 2004: 310; Chant & McMurtry, 2007: 152.

*Amblydromella (Aphanoseia) argyronama*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured —South Africa: holotype). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 390 long and 218 wide; mostly smooth, with few anterolateral striae. With 5 pairs solenostomes. Setae j1 25, j3 24, j4 13, j5 14, j6 17, J2 22, J5 10, z2 15, z3 25, z4 21, z5 17, Z4 31, Z5 47, s4 24, s6 27, S2 30, S4 31, S5 24, r3 25, R1 24. Setae smooth and sharp-tipped, except Z5, serrate and knobbed; latter inserted on tubercle.

Peritreme. Extending to level of j1.

Venter. According to the original description, sternal shield smooth with 2 pairs of setae (ST3 on integument), posterior margin lightly sclerotized, with a faintly noticeable median lobe; distances between ST1-ST3 67, ST2-ST2 58. Genital shield smooth; distance between ST5-ST5 65. Ventrianal shield smooth, pentagonal, with anterior margin convex, 124 long, 102 wide at level of ZV2, 95 wide at level of anus, with 4 pairs of pre-anal setae; pre-anal pores absent. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, blunt distally.

Chelicera. Movable digit 32 long, with 2 teeth; fixed digit 29 long, with 5 teeth.

Spermatheca. Proximal half of calyx slightly bulged and thick walled; distal half thin walled and slightly flared toward vesicle, 15 long.

Legs. Macrosetae knobbed; Sge IV 22, Sti IV 22, St IV 39. Chaetotaxy: genu II: 2-2/0,2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype and 1 paratype female, on an unidentified herb, 5km from Silverstream Beach near Cape Town, Western Cape Province, 18-VI-1981, D.P. Keetch.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) asperosetosus* Zannou, Moraes & Oliveira, n. sp.

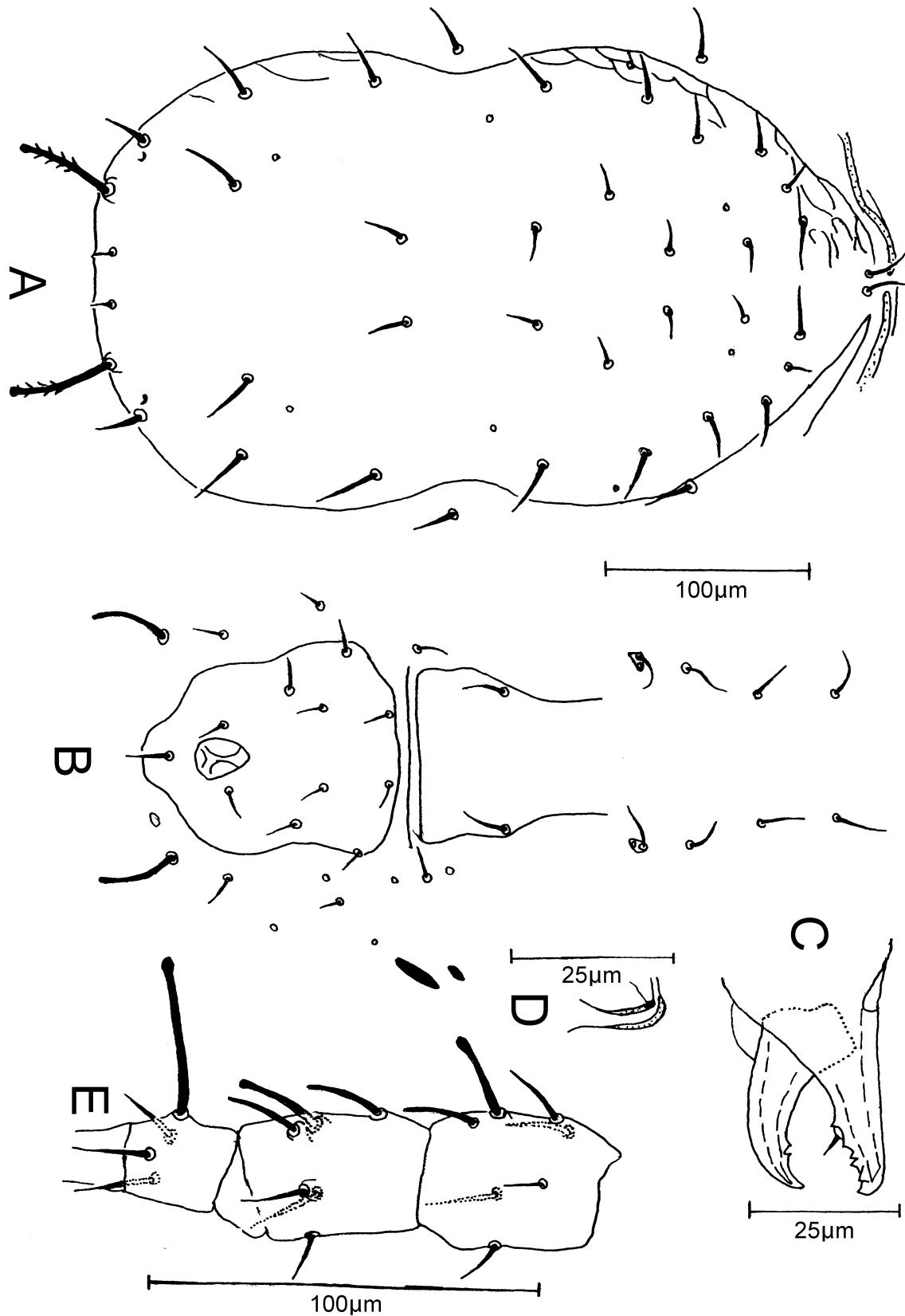
(Fig. 4)

**Diagnosis.** This species is distinct by having dorsal shield strongly areolate; dorsal setae slightly thickened; setae Z4, Z5 and S4 lanceolate and strongly serrate, Z5 slightly knobbed; caudoventral seta JV5 smooth and knobbed; calyx of spermatheca saccular; macroseta present only on basitarsus of leg IV.

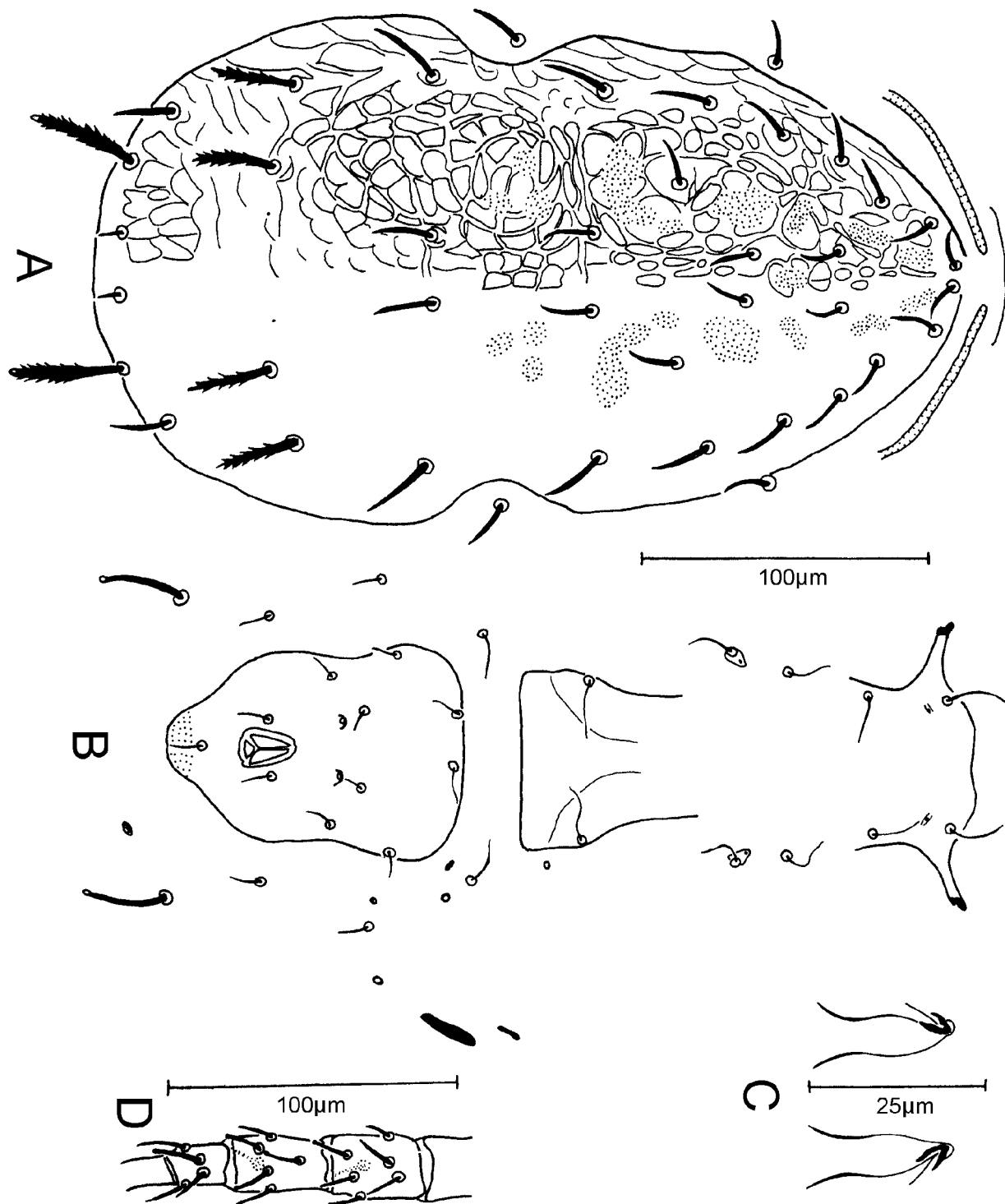
FEMALE. (1 specimen measured). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield, 317 long and 179 wide, strongly areolate. Setae j1 18, j3 26, j4 16, j5 16, j6 19, J2 24, J5 10, z2 18, z3 19, z4 22, z5 18, Z4 32, Z5 42, s4 22, s6 24, S2 27, S4 32, S5 21, r3 16, R1 19. Setae smooth, slightly thickened and sharp-tipped, except Z4, Z5 and S4, lanceolate and strongly serrate, and Z5, slightly knobbed.

Peritreme. Extending to level of j1.



**FIGURE 3.** *Typhlodromus (Anthoseius) argyronamus* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.



**FIGURE 4.** *Typhlodromus (Anthoseius) asperosetosus* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

Venter. Sternal shield smooth, posterior part of lateral margins and posterior margin indistinct; ST1 and ST2 inserted on well sclerotized portion of shield; ST3 inserted on unsclerotized cuticle; distances between ST1-ST3 56, ST2-ST2 51. Genital shield smooth; distance between ST5-ST5 61. Ventrianal shield smooth, pentagonal, with anterior margin almost straight, 107 long, 80 wide at level of ZV2, 72 wide at level of anus, with 4 pairs of pre-anal setae; elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal

shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Position renders it impossible to measure the digits and counting the numbers of the teeth.

Spermatheca. Calyx saccular, 17 long; atrium bifurcate.

Legs. Macroseta knobbed: St IV 19. Genu and tibia IV with 3 and 2 knobbed setae, respectively. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female from *Chromolaena odorata*, 37 km E. Bertoua, Cameroon, 3-II-1991, A. Onzo, deposited at ESALQ-USP.

**Etymology.** The name *asperosetosus* refers to the shape of setae Z4, Z5 and S4 of this species.

**Remarks.** *Typhlodromus* (*A.*) *matthyssei* Ueckermann & Loots and *T.* (*A.*) *terrulentis* Van der Merwe differ from this new species by having S5 serrate. Furthermore, the former has seta S4 setiform and smooth, calyx of spermatheca slender near atrium opposite to buldge near atrium in the new species, whereas the latter has Z4 knobbed. In the new species and *T.* (*A.*) *terrulentis* setae Z4 are more than half the length to S5, whereas in *T.* (*A.*) *matthyssei* it is shorter than half the distance to S5. The shapes of the spermathecae of the three species also differ clearly.

### *Typhlodromus* (*Anthoseius*) *astibus* Ueckermann & Loots

(Fig. 5)

*Typhlodromus* (*Seiulus*) *astibus* Ueckermann & Loots, 1984: 308.

*Amblydromella* (*Aphanoseia*) *astibus*, Denmark & Welbourn, 2002: 308.

*Typhlodromus* (*Anthoseius*) *astibus*, Moraes *et al.*, 2004: 310; Chant & McMurtry, 2007: 152.

FEMALE. (Specimens measured—Namibia: holotype, 1 paratype; Cape Verde: 4 females). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 324 (315–333) [315] long and 167 (146–184) [155] wide; incompletely covered with striae and reticulations. With 5 pairs of solenostomes. Setae j1 18 (16–19) [16], j3 27 (24–30) [25], j4 23 (18–26) [19], j5 24 (21–28) [21], j6 37 (32–44) [32], J2 44 (35–53) [40], J5 12 (11–13) [11], z2 20 (16–21) [16], z3 30 (26–32) [26], z4 31 (28–35) [31], z5 29 (20–29) [24], Z4 48 (39–55) [43], Z5 43 (41–45) [45], s4 35 (33–36) [33], s6 35 (33–37) [33], S2 42 (37–46) [41], S4 42 (36–48) [37], S5 36 (33–42) [33], r3 29 (26–33) [30], R1 36 (33–40) [34]; Setae smooth and sharp-tipped, except Z5, serrate.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin convex; distances between ST1–St3 62 (59–67) [59], ST2–ST2 47 (46–49) [46]. Genital shield smooth; distance between ST5–ST5 49 (46–53) [48]. Ventrianal shield smooth, vase-shaped, with anterior margin slightly convex, 102 (91–110) [102] long, 55 (47–63) [56] wide at level of ZV2, 55 (46–63) [47] wide at level of anus, with 4 pairs of pre-anal setae; round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 19 (18–20) long, with 1 tooth; fixed digit 20 (20–21) long, with 4 teeth.

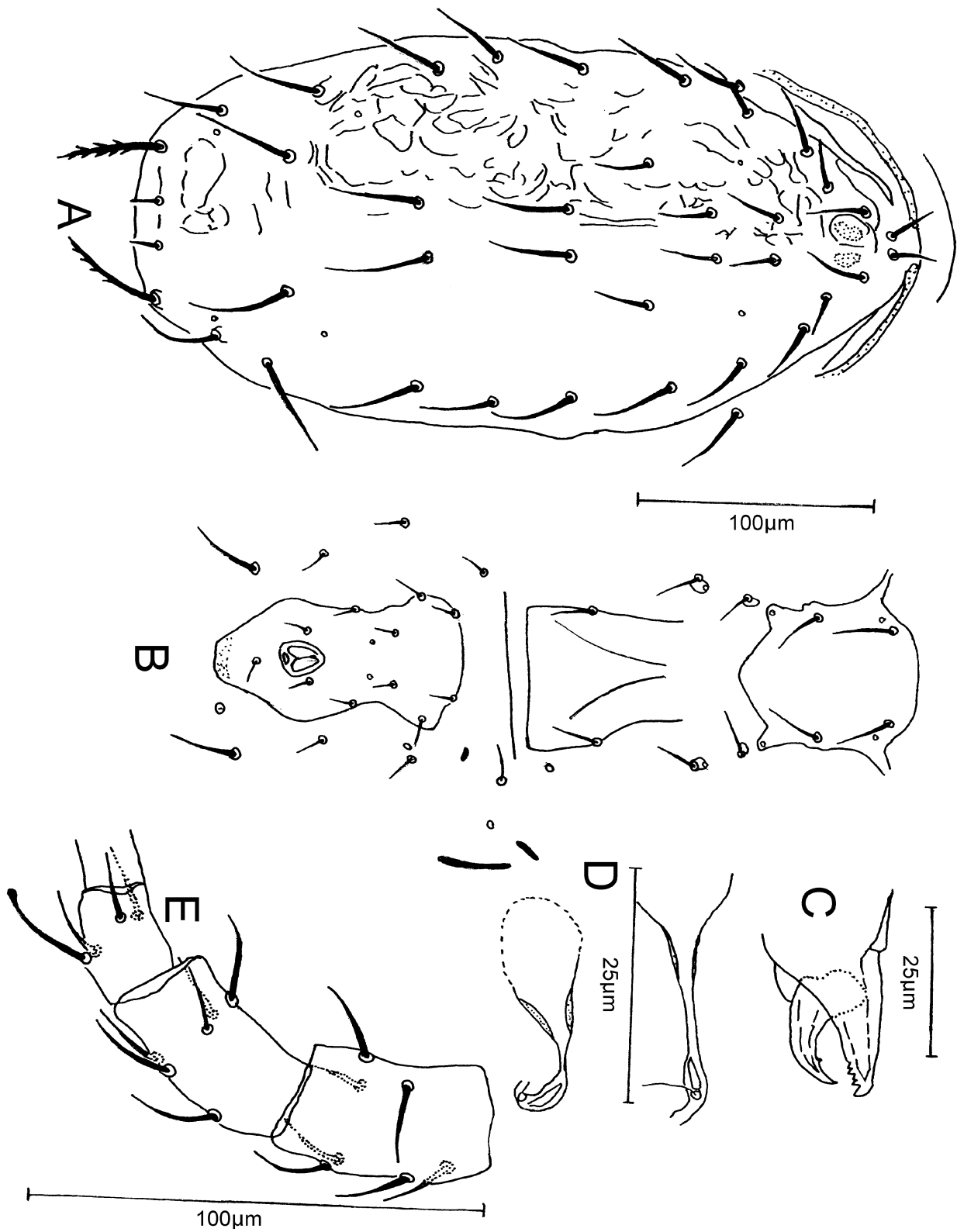
Spermatheca. Calyx distally bulged next to atrium, followed by a slender tube that flares toward the vesicle, 21 (18–24) [24] long; atrium bulbous.

Legs. Macroseta knobbed; St IV 20 (18–22) [19]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined.** **Namibia:** Holotype and 1 paratype female, Gobabeb, on *Ficus* sp., 9-III-1980, P.D. Theron; 1 female, Naukluft National Park, on *Ficus sycomorus*, 22-IV-1992, S. Nesar; **Cape Verde Islands:** 3 females, Sao Jorge, on *F. sycomorus*, 25-VIII-1983, A. Van Harten.

**Remarks.** This species cannot be placed in any of the species groups of Chant & McMurtry (1994). Ueckermann & Loots (1984) considered R1 as S1, which is not present in the Phytoseiidae.

**World distribution.** Namibia and Cape Verde Islands.



**FIGURE 5.** *Typhlodromus (Anthoseius) astibus* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.



## *Typhlodromus (Anthoseius) asticus* El-Banhawy & Abou-Awad

*Typhlodromus asticus* El-Banhawy & Abou-Awad, 1991: 217.

*Amblydromella (Amblydromella) asticus*, Denmark & Welbourn, 2002: 307.

*Typhlodromus (Anthoseius) asticus*, Moraes *et al.*, 2004: 310; Chant & McMurtry, 2007: 152.

**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield mostly smooth, with anterolateral striae; dorsal setae smooth and sharp-tipped, except Z5, serrate; setae r3 and R1 inserted on integument; seta ST3 inserted on sternal shield; posterior margin of sternal shield with a median lobe; ventrianal shield pentagonal and reticulate, with 4 pairs of pre-anal setae (seta JV3 present); calyx of spermatheca saccular; peritreme extending anteriorly to level of j1; with a macroseta on basitarsus of leg IV. Described from specimens collected at Arusha, Tanzania, on unspecified substrate. No additional specimens were collected in the present study.

**World distribution.** Tanzania.

## *Typhlodromus (Anthoseius) auratus* Ueckermann & Loots

(Fig. 6)

*Typhlodromus (Anthoseius) auratus* Ueckermann & Loots, 1988: 28; Moraes *et al.*, 2004: 311; Chant & McMurtry, 2007: 152.

*Amblydromella (Aphanoseia) aurata*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype and 7 paratypes). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 320 (307–337) [315] long and 166 (158–172) [166] wide; strongly reticulate. With 5 pairs of solenostomes but not arranged as in fig. 6 but as described for *T. (A.) acaciae*. Setae j1 20 (18–23) [21], j3 20 (19–21) [20], j4 14 (13–15) [15], j5 14 (12–15) [15], j6 16 (14–18) [15], J2 18 (16–21) [18], J5 9 (8–10) [9], z2 18 (16–20) [17], z3 23 (21–25) [24], z4 22 (21–24) [22], z5 16 (15–18) [18], Z4 34 (28–37) [37], Z5 57 (52–61) [61], s4 26 (24–27) [24], s6 26 (24–28) [26], S2 27 (25–30) [27], S4 25 (22–26) [26], S5 22 (20–24) [22], r3 24 (20–27) [27], R1 21 (19–24) [21]. Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae; ST3 on separate shields; posterior margin with a median lobe; distances between ST1–ST3 56 (54–59) [54], ST2–ST2 50 (48–51) [51]. Genital shield smooth; distance between ST5–ST5 50 (49–52) [51]. Ventrianal shield reticulate, pentagonal, with anterior margin convex, 107 (100–112) [106] long, 83 (77–86) [82] wide at level of ZV2, 71 (69–73) [69] wide at level of anus, with 4 pairs of pre-anal setae; round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 26 (24–27) [26] long, with 1 tooth; fixed digit 27 (26–28) [27] long, with 4 teeth.

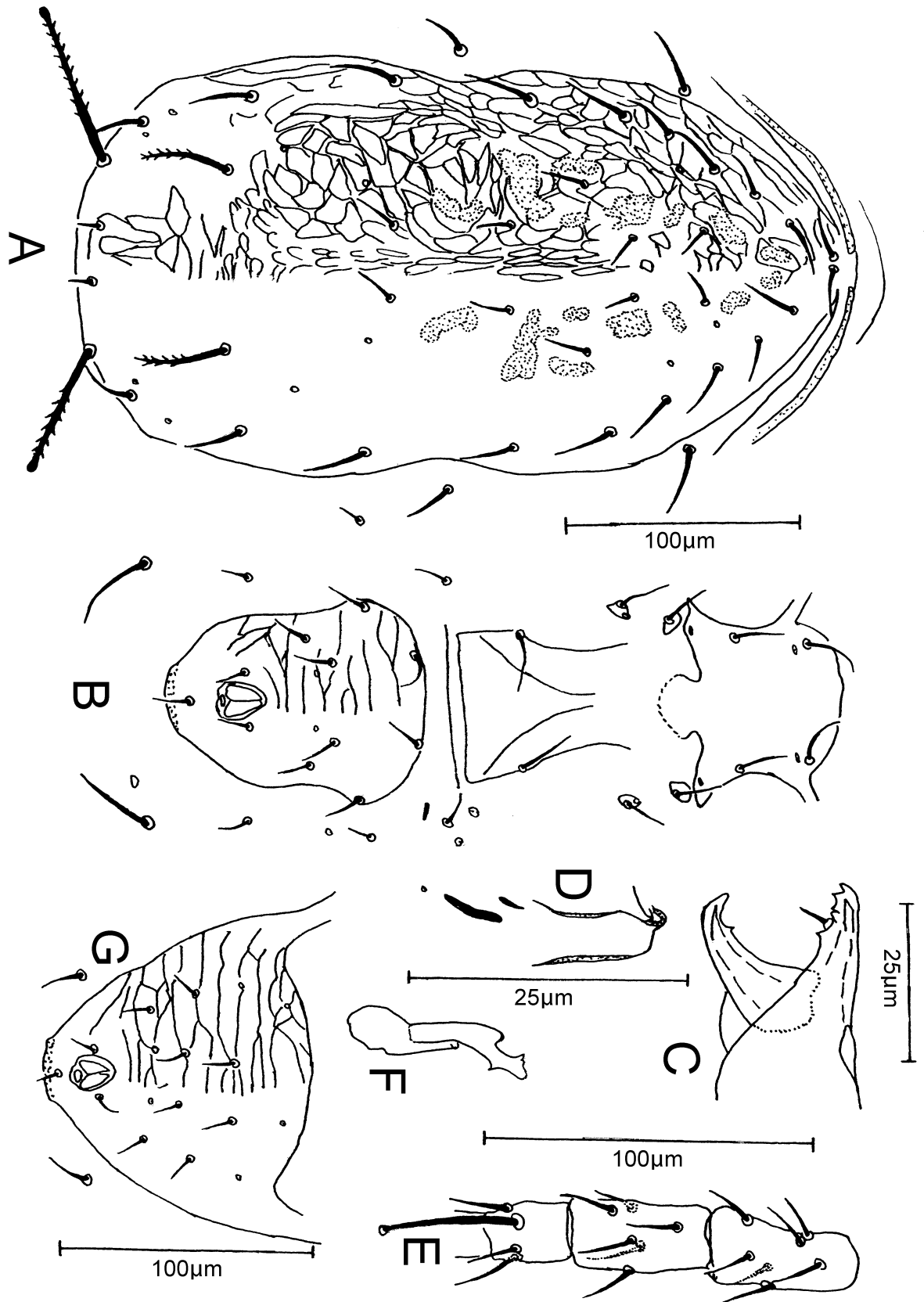
Spermatheca. Calyx a broad tube, 11 (9–12) [9] long; atrium nodular.

Legs. Macroseta knobbed; St IV 35 (32–36) [34]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured – South Africa: 4 paratypes)

Dorsum. Dorsal shield pattern and setae as in female, 258 (254–261) long and 149 (135–159) wide. Setae j1 16 (15–18), j3 17 (15–18), j4 12 (10–13), j5 12 (11–12), j6 12 (11–13), J2 13 (12–14), J5 9 (8–10), z2 13 (11–14), z3 15 (14–17), z4 17 (16–18), z5 11 (10–13), Z4 21 (20–23), Z5 34 (30–37), s4 18 (16–20), s6 19 (18–20), S2 18 (15–19), S4 17 (16–18), S5 14 (12–16), r3 19 (18–19), R1 15 (13–16).

Peritreme. Extending to level of j1.



**FIGURE 6.** *Typhlodromus (Anthoseius) auratus* Ueckermann & Loots: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

Venter. Ventrianal shield subtriangular, reticulate, fused with peritrematal shields, 107 (102–111) long, 135 (128–141) wide at the anterior corners; with 4 pairs of pre-anal setae and 2 distinguishable pairs of lyrifissures (1 anterior to JV1 and 1 lateral and transversally aligned with JV1); round pre-anal pores posterior and vertically aligned with JV2.

Spermatodactyl. Bends distally and ends in a truncate fashion, shaft 21 (20–22) long.

Legs. Macroseta knobbed; St IV 26 (25–27). Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype and 1 paratype female, Free State Province, Golden Gate National Park, on an unidentified plant, 11-II-1982, E.A. Ueckermann; 1 paratype female, Free State Province, Golden Gate National Park, on *Geranium canescens*, 11-II-1982, E. A. Ueckermann; 1 paratype female, Free State Province, Golden Gate National Park, on *Rhus dentata*, 8-II-1982, E.A. Ueckermann; 1 paratype female and 1 paratype male, Kwazulu/Natal Province, Giant's Castle, on *Myrsine africana*, 4-II-1982, E.A. Ueckermann; 2 paratype females and 1 paratype male, Kwazulu/Natal Province, Giant's Castle, on *Senecio subrubriflorus*, 4-II-1982, E.A. Ueckermann; 1 paratype female and 2 paratype males Kwazulu/Natal Province, Giant's Castle, on *Buchenroedea cytisoides*, 3-II-1982, E.A. Ueckermann.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) balanites* El-Badry

*Typhlodromus balanites* El-Badry, 1967a: 469.

*Amblydromella (Amblydromella) balanites*, Denmark & Welbourn, 2002: 307.

*Typhlodromus (Anthoseius) balanites*, Moraes *et al.*, 2004: 313; Chant & McMurtry, 2007: 152.

**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield strongly reticulate; all dorsal setae smooth and sharp-tipped; setae Z5 on distinct tubercles; setae r3 and R1 inserted on integument; seta ST3 inserted on sternal shield; posterior margin of sternal shield concave; ventrianal shield pentagonal, with 4 pairs of pre-anal setae; calyx of spermatheca bell-shaped; peritreme extending anteriorly to level of j1; fixed and movable cheliceral digits toothless; with a single and sharp-tipped macroseta on basitarsus of leg IV. Described from specimens collected at Shambat, Khartoum, Sudan, on *Balanites aegyptiaca*. No additional specimens were collected in the present study.

**World distribution.** Sudan and Egypt.

### *Typhlodromus (Anthoseius) bergi* Moraes & McMurtry

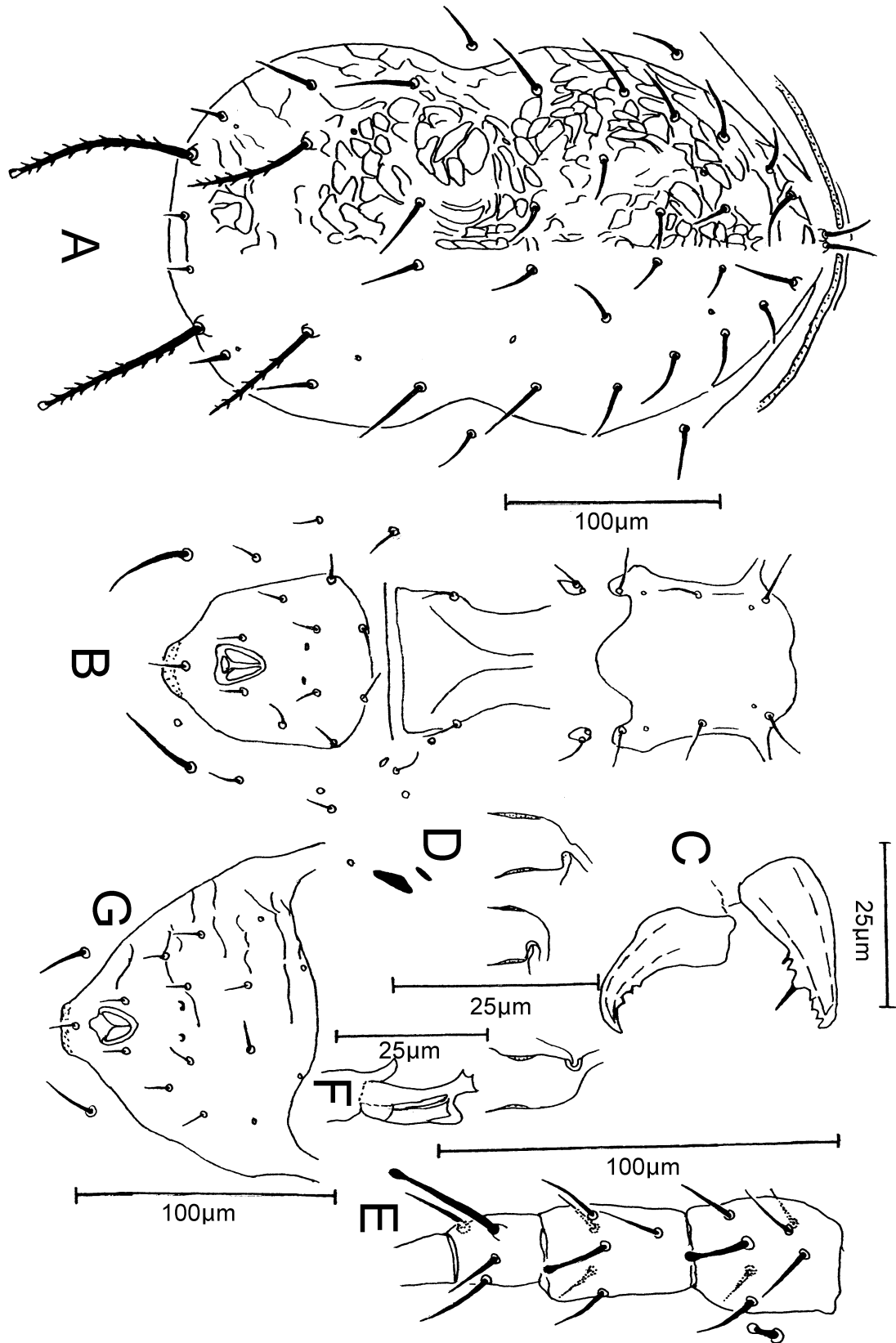
*Typhlodromus bergi* Moraes & McMurtry, 1988: 17.

*Amblydromella (Amblydromella) bergi*, Denmark & Welbourn, 2002: 307.

*Typhlodromus (Anthoseius) bergi*, Moraes *et al.*, 2004: 313; Chant & McMurtry, 2007: 152.

**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield mostly smooth, with few anterolateral striae; dorsal setae smooth and sharp-tipped, except Z4 and Z5, serrate; setae r3 and R1 inserted on integument; seta ST3 inserted on sternal shield; posterior margin of sternal shield indistinct; ventrianal shield subquadrate, with 4 pairs of pre-anal setae (seta JV3 present); calyx of spermatheca funnel-shaped; peritreme extending to level of j1; fixed cheliceral digit apparently with 4 teeth and movable digit apparently with 2 teeth; with sharp-tipped macroseta on basitarsus of leg IV. Described from specimens collected at Margarini, Kenya, on *Digitaria argyrotricha*. No additional specimens were collected in the present study.

**World distribution.** Kenya.



**FIGURE 7.** *Typhlodromus (Anthoseius) buccalis* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

***Typhlodromus (Anthoseius) buccalis* Van der Merwe**

(Fig. 7)

*Typhlodromus (Anthoseius) buccalis* Van der Merwe, 1968: 55; Moraes *et al.*, 2004: 314; Chant & McMurtry, 2007: 152.  
*Amblydromella buccalis*, Moraes *et al.*, 1986: 157.

*Amblydromella (Amblydromella) buccalis*, Denmark & Welbourn, 2002: 307.

FEMALE. (Specimens measured—South Africa: holotype, 2 paratypes and 4 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 316 (288–355) [295] long and 185 (167–198) [167] wide; reticulate. With 5 pairs of solenostomes, gd4 omitted from fig. 7A. Setae j1 22 (20–23) [22], j3 26 (21–28) [25], j4 18 (16–19) [17], j5 19 (17–21) [19], j6 22 (20–24) [22], J2 28 (26–30) [28], J5 11 (10–12) [12], z2 19 (15–22) [18], z3 25 (21–30) [25], z4 26 (23–29) [25], z5 21 (19–23) [21], Z4 52 (44–63) [55], Z5 73 (66–80) [77], s4 28 (24–31) [26], s6 33 (27–37) [32], S2 35 (31–40) [36], S4 31 (25–36) [27], S5 16 (14–17) [16], r3 23 (20–26) [24], R1 23 (20–27) [20]. Setae smooth, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a median lobe; distances between ST1–ST3 58 (54–60) [59], ST2–ST2 54 (52–56) [52]. Genital shield smooth; distance between ST5–ST5 58 (52–64) [52]. Ventrianal shield smooth, pentagonal, with anterior margin convex, 102 (90–114) [90] long, 84 (76–95) [76] wide at level of ZV2 and 75 (65–85) [65] wide at level of anus, with 4 pairs of pre-anal setae; elliptical pre-anal pores slightly posterior to and mesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 26 (25–27) [25] long, with 3 teeth; fixed digit 23 (20–25) [20] long, with 5 teeth.

Spermatheca. Calyx a short, broad tube, 9 (7–12) [7] long; atrium small incorporated in calyx.

Legs. Macrosetae knobbed; Sge IV 11 (5–16) [16], Sti IV 19 (18–19) [18], St IV 29 (26–31) [31]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimen measured – South Africa: 1)

Dorsum. Dorsal shield pattern and setae as in female, 251 long and 159 wide. Setae j1 17, j3 17, j4 12, j5 15, j6 15, J2 21, J5 11, z2 15, z3 15, z4 16, z5 14, Z4 29, Z5 45, s4 19, s6 21, S2 23, S4 20, S5 13, r3 16; R1 broken.

Peritreme. Extending almost to level of j1.

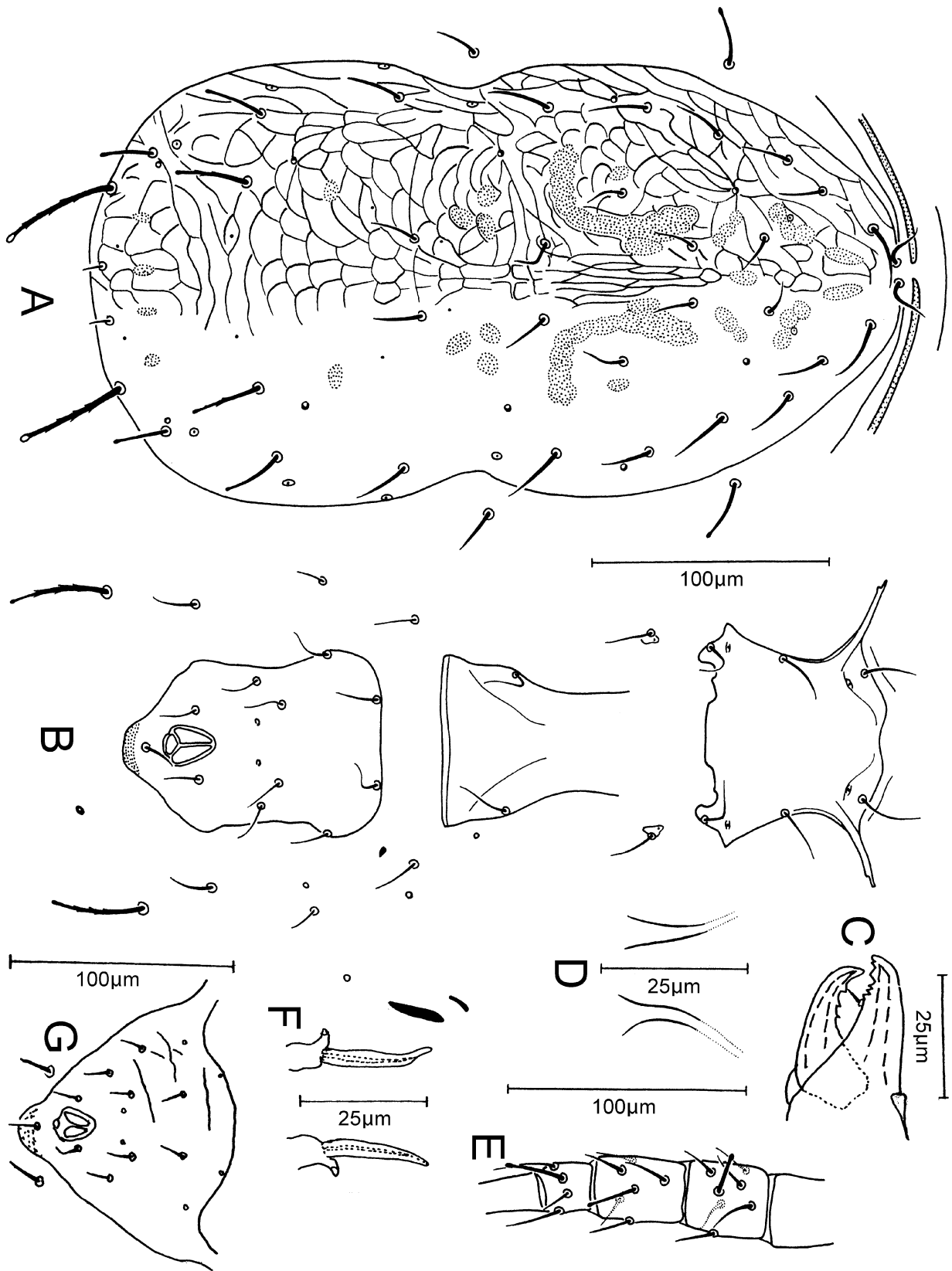
Venter. Ventrianal shield subtriangular, with few striae, fused with peritrematal shields, 98 long, 128 wide at the anterior corners; with 4 pairs of pre-anal setae and 2 distinguishable pairs of lyrifissures (1 anterior to JV1 and 1 lateral transversally aligned with JV1); elliptical pre-anal pores almost transversally aligned with JV2.

Spermatodactyl. Broad narrows distally and slightly bent ending rather truncate; shaft 23 long.

Legs. Macrosetae knobbed; Sge 6, Sti IV 15, St IV 21. Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype and 1 paratype females, Eastern Cape Province, Storms River Mouth, Tsitsikamma National Park, on an unidentified plant, 20-I-1965, M.K.P. Smith Meyer; 1 paratype female, Eastern Cape Province, Tsitsikamma, on *Curtisia dentata*, 19-I-1965, G.G. van der Merwe; 1 paratype female, Eastern Cape Province, Bloukrans Pass on *C. dentata*, 21-I-1965, M.K.P. Smith Meyer; 1 female, Western Cape Province, Oranje Kloof, Cape Town, on *Grewia* sp., 14-II-1996, J. Midgley; 1 female, Kwazulu/Natal Province, Rietspruit Pongola, on *Spirostachys africana*, 8-VIII-1980, E.A. Ueckermann; 1 female and 1 male Kwazulu/Natal Province, 25 km from Jozini to Naingwavuma, on *Maytenus senegalensis*, 19-IX-1972, F.W. Schultz; Limpopo Province, Vurhami, Kruger National Park, 1-X-1963, G.G. van der Merwe.

**World distribution.** South Africa.



**FIGURE 8.** *Typhlodromus (Anthoseius) bullatus* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

***Typhlodromus (Anthoseius) bullatus* Van der Merwe**

(Fig. 8)

*Typhlodromus (Anthoseius) bullatus* Van der Merwe, 1968: 44; Moraes *et al.*, 2004: 315; Chant & McMurtry, 2007: 152.  
*Amblydromella bullata*, Moraes *et al.*, 1986: 157.  
*Typhlodromus bullatus*, El-Banhawy, 2002: 189.

**FEMALE.** (Specimens measured—Kenya: 1; South Africa: holotype and 4 additional specimens). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield 350 (327–360) [260] long and 188 (175–196) [196] wide, reticulate. With 5 pairs of solenostomes. Setae j1 20 (17–22) [21], j3 24 (22–29) [29], j4 14 (14–15) [15], j5 17 (15–18) [18], j6 17 (16–19) [19], J2 20 (18–23) [23], J5 11 (10–11) [10], z2 19 (18–21) [21], z3 21 (20–23) [23], z4 22 (18–26) [26], z5 17 (15–19) [19], Z4 27 (25–31) [31], Z5 46 (41–50) [50], s4 23 (22–25) [25], s6 24 (21–28) [28], S2 24 (20–28) [28], S4 24 (22–27) [27], S5 21 (19–24) [24], r3 24 (21–27) [27], R1 18 (15–19) [19]. Setae smooth and sharp-tipped, except Z4 and Z5, serrate and knobbed, S4, S5 and r3, smooth and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with small protuberance; distances between ST1–ST3 63 (60–64) [64], ST2–ST2 61 (59–64) [63]. Genital shield smooth; distance between ST5–ST5 57 (55–61) [57]. Ventrianal shield smooth, pentagonal, with anterior margin slightly concave, 111 (106–119) [119] long, 79 (75–82) [80] wide at level of ZV2, 72 [78] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present), round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Cau-doventral setae smooth and sharp-tipped, except JV5, slightly serrate and knobbed.

Chelicera. Movable digit 29 (28–31) [29] long, with 3 teeth; fixed digit 25 (24–27) [25] long, with 5 teeth.

Spermatheca. Calyx a very long and slender tube, gradually flaring toward vesicle, [71]; only portion next to vesicle is visible in specimen from Kenya, 26 long; atrium kidney-shaped.

Legs. Macrosetae knobbed; Sge IV 18 (18–19) [19], Sti IV 18 (17–19) [19], St IV 26 (24–27) [25]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

**MALE.** (Specimen measured—South Africa: 1)

Dorsum. Dorsal shield pattern and setae as in female, 253 long and 156 wide. Setae j1 16, j3 23, j4 15, j5 15, j6 16, J2 17, J5 13, z2 17, z3 21, z4 23, z5 14, Z4 24, Z5 36, s4 23, s6 20, S2 22, S4 21, S5 17, r3 broken, R1 15.

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, with few striae, fused with peritrematal shields, 95 long, 123 wide at the anterior corners; with 4 pairs of pre-anal setae and 2 distinguishable pairs of lyrifissures (1 anterior to JV1, 1 lateral and transversally aligned with JV1); round pre-anal pores posteromesad of JV2.

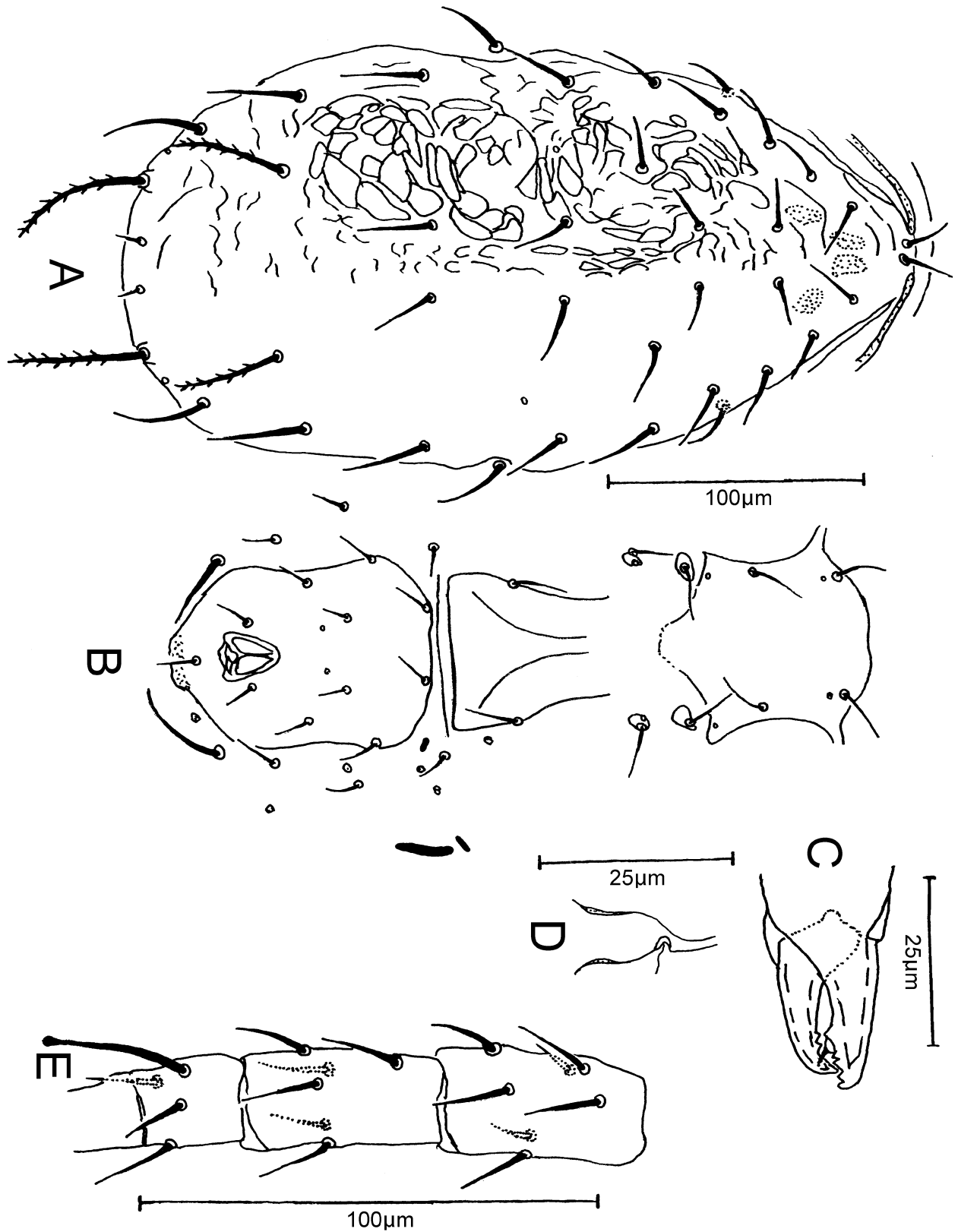
Spermatodactyl. Straight or slightly bent, tapered distally, shaft 22 long.

Legs. Macrosetae knobbed on tarsus and slightly knobbed on genu and tibia; Sge IV 14, Sti IV 15, St IV 18. Chaetotaxy of genua II and III as in female.

**Specimens examined.** **Kenya:** 1 female, Sondu, Nyanza Province, on *Ficus sycomorus*, 3-XII-1989, J.S. Yaninek. **South Africa:** Holotype female, Limpopo Province, Mlambane, Kruger National Park, on *F. sycomorus*, 4-X-1953, M.K.P. Smith Meyer; 4 females, Mpumalanga Province, 15 km from Swaziland border to Amanxale, on *F. sycomorus*, 5-II-1985, E.A. Ueckermann. 1 male, Kwazulu/Natal Province, Pongola River near Golela, on *F. sycomorus*, 19-VIII-1980, E.A. Ueckermann.

**Remarks.** The single specimen collected from Kenya has JV5 slightly serrate and macrosetae only on genu and tarsus of leg IV; specimens from South Africa have JV5 smooth, and have in addition to the macrosetae on genu and tibia of leg IV, a knobbed seta (slightly shorter than the macroseta) on each of those segments.

**World distribution.** Kenya, Lesotho and South Africa.



**FIGURE 9.** *Typhlodromus (Anthoseius) capparidis* Van der Merwe (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.



***Typhlodromus (Anthoseius) capparidis* Van der Merwe**

(Fig. 9)

*Typhlodromus (Anthoseius) capparidis* Van der Merwe, 1968: 26; Moraes *et al.*, 2004: 315; Chant & McMurtry, 2007: 152.

*Amblydromella capparidis*, Moraes *et al.*, 1986: 157.

*Amblydromella (Aphanoseia) capparidis*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 3 paratypes and 4 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 309 (289–323) [302] long and 171 (148–184) [148] wide; striate between j1–j4, reticulate between j4–z4 and striate posteriorly. With 5 pairs of solenostomes. Setae j1 20 (16–22) [21], j3 26 (22–31) [23], j4 19 (15–25) [16], j5 20 (16–28) [18], j6 24 (17–31) [25], J2 30 (26–42) [28], J5 11 (10–15) [10], z2 22 (17–28) [20], z3 26 (20–33) [20], z4 28 (24–35) [26], z5 22 (19–27) [20], Z4 39 (30–44) [41], Z5 50 (45–58) [52], s4 30 (24–36) [28], s6 33 (24–39) [31], S2 35 (28–41) [33], S4 36 (28–44) [33], S5 34 (30–37) [35], r3 27 (24–31) [23], R1 27 (23–34) [27]. Setae smooth and sharp-tipped, except Z4 and Z5, serrate.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 inserted on separate shields); posterior margin with a median lobe; distances between ST1–ST3 57 (54–62) [55], ST2–ST2 49 (44–52) [50]. Genital shield smooth; distance between ST5–ST5 49 (43–54) [51]. Ventrianal shield smooth, pentagonal, with anterior margin slightly convex, 103 (94–111) [109] long, 78 (73–85) [74] wide at level of ZV2, 75 (70–83) [72] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 24 (21–25) long, with 2 teeth; fixed digit 21 (20–22) long, with 4 teeth.

Spermatheca. Calyx bell-shaped, 11 (10–13) [11] long; atrium small, incorporated in calyx.

Legs. Macroseta knobbed; St IV 24 (22–26) [23]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined.** **South Africa:** Holotype and 2 paratype females, Eastern Cape Province, Addo Elephant National Park, on *Capparis citrifolia*, 11-I-1965, G.G. van der Merwe; 1 paratype female, Eastern Cape Province, Grahamstown, on *Malva* sp., 9-I-1956, P.A.J. Ryke; 1 female, Northern Cape Province, Hondeklipbaai, on *Protasparagus capensis*, 18-IX-1983, E.A. Ueckermann; two females, Eastern Cape Province, Mount Zebra National Park, on *Ballota africana*, 4-III-1986; 1 female, Eastern Cape Province, Tsitsikamma Sea Coast National Park, on *Helichrysum odoratissimum*, 10-III-1986, E.A. Ueckermann.

**World distribution.** South Africa.

***Typhlodromus (Anthoseius) celastrus* Ueckermann & Loots**

(Fig. 10)

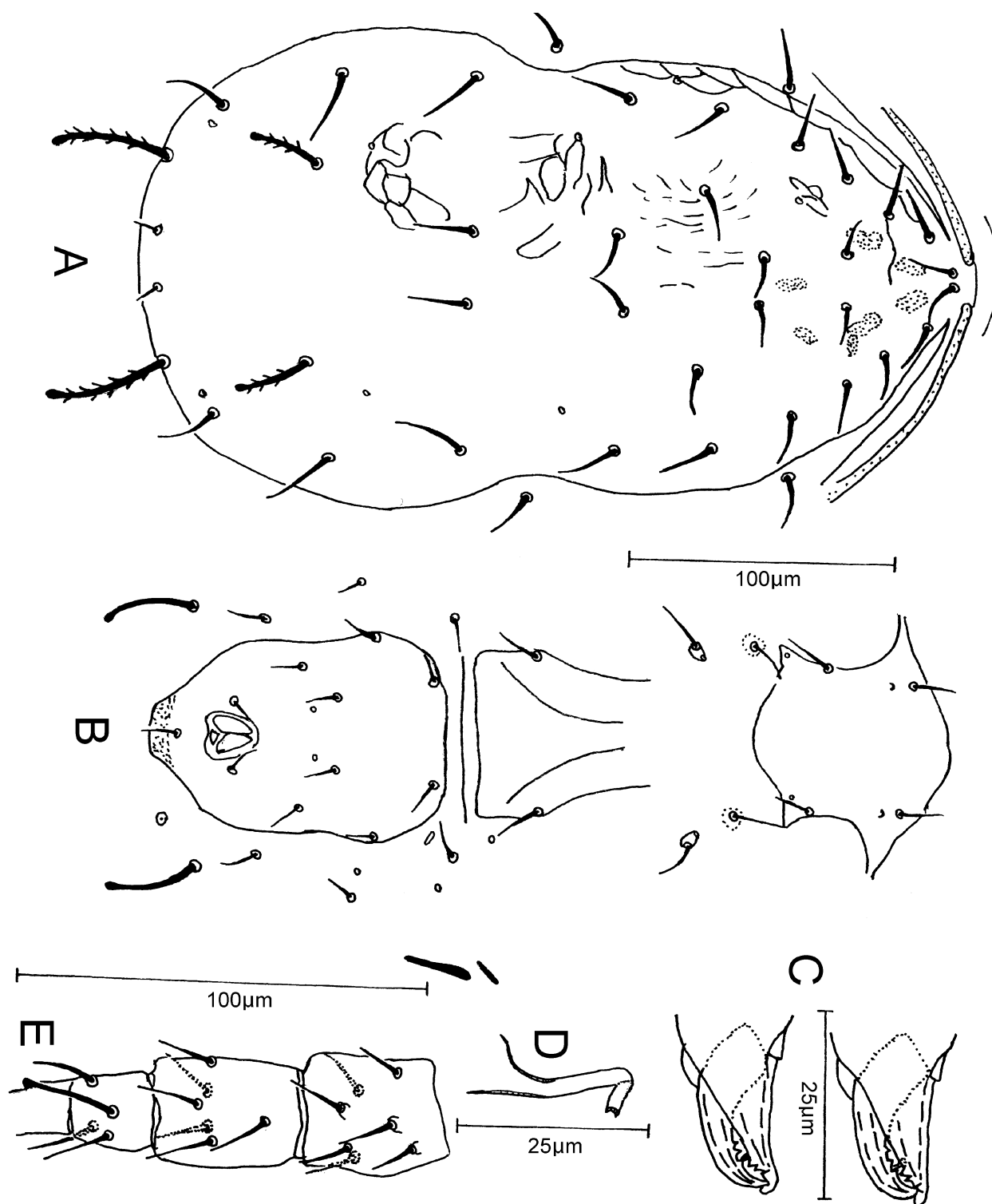
*Typhlodromus (Anthoseius) celastrus* Ueckermann & Loots, 1988: 23; Moraes *et al.*, 2004: 217; Chant & McMurtry, 2007: 152.

*Amblydromella (Aphanoseia) celastra*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype and 3 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 313 (307–323) [311] long and 163 (157–166) [157] wide; mostly smooth, with few anterolateral and median reticulations. With 5 pairs of solenostomes. Setae j1 19 (18–20) [18], j3 20 (18–20) [18], j4 15 (14–16) [14], j5 16 (15–17) [16], j6 20 (18–21) [18], J2 25 (23–28) [24], J5 9 (7–10) [9], z2 16 (14–18) [16], z3 19 (16–20) [16], z4 19 (16–21) [18], z5 18 (16–20) [16], Z4 29 (27–31) [27], Z5 44 (42–46) [42], s4 21 (19–24) [21], s6 23 (21–24) [21], S2 28 (26–31) [27], S4 28 (27–29) [27], S5 25 (23–26) [25], r3

20 (18–23) [18], R1 20 (17–23) [17]. Setae smooth and sharp-tipped, except Z4 and Z5, serrate and knobbed. Peritreme. Extending to level of j1.



**FIGURE 10.** *Typhlodromus (Anthoseius) celsastrus* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin convex; distances between ST1-ST3 59 (57–61) [57], ST2-ST2 50 (49–51) [50]. Genital shield smooth; distance between ST5-ST5 56 (55–57) [55]. Ventrianal shield smooth, pentagonal, with anterior margin almost

straight, 107 (101–111) [109] long, 77 (75–79) [78] wide at level of ZV2, 71 (67–75) [67] wide at level of anus; round pre-anal pores posteromesad of JV2, with 4 pairs of pre-anal setae (seta JV3 present). With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5 knobbed.

Chelicera. Movable digit 23 long, with 3 teeth; fixed digit 22 long, with 3 teeth.

Spermatheca. Calyx tubular, flaring toward vesicle, 21 (20–23) [20] long; atrium indistinct.

Legs. Macroseta knobbed; St IV 21 (20–23) [23]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female, Kwazulu/Natal Province, 16 km north-east of Hluhluwe, on *Maytenus heterophylla*, 21-VIII-1980, E.A. Ueckermann; 1 female, Kwazulu/Natal Province, Ramsgate, on *Ficus sur*, 6-IX-1990, E.A. Ueckermann; 1 female, Kwazulu/Natal Province, Ramsgate, *Citrus limon*, 6-IX-1990, E.A. Ueckermann; 1 female, Kwazulu/Natal Province, Ramsgate, on *Brumfelsia exima*, 7-IX-1990, E.A. Ueckermann.

**World distribution.** South Africa.

### ***Typhlodromus (Anthoseius) cephalochaitosus* Moraes, Oliveira & Zannou**

*Typhlodromus (Anthoseius) cephalochaitosus* Moraes *et al.*, 2001a: 8; Moraes *et al.*, 2004: 317; Chant & McMurtry 2007: 152.

**Remarks.** Female with idiosomal setal pattern 11D:8A/JV:ZV; dorsal shield with scattered reticulations; dorsal setae smooth and knobbed, except Z5, serrate, and J5, sharp-tipped; setae r3 and R1 inserted on integument; seta z3 absent; sternal shield with 3 pairs of setae; posterior margin of sternal shield indistinct; ventrianal shield subquadrate, with 4 pairs of pre-anal setae (seta JV3 present); calyx of spermatheca funnel-shaped; peritreme extending to level between j1 and j3; fixed cheliceral digit with 2 teeth; movable cheliceral digit with 2 teeth; with knobbed macrosetae only on genu and basitarsus of leg IV. Described from specimens collected 3 km N of Lunga-Lunga, Coast, Kenya, on *Ficus* sp. No additional specimens were collected in the present study.

**World distribution.** Kenya.

### ***Typhlodromus (Anthoseius) combretum* McMurtry & Moraes**

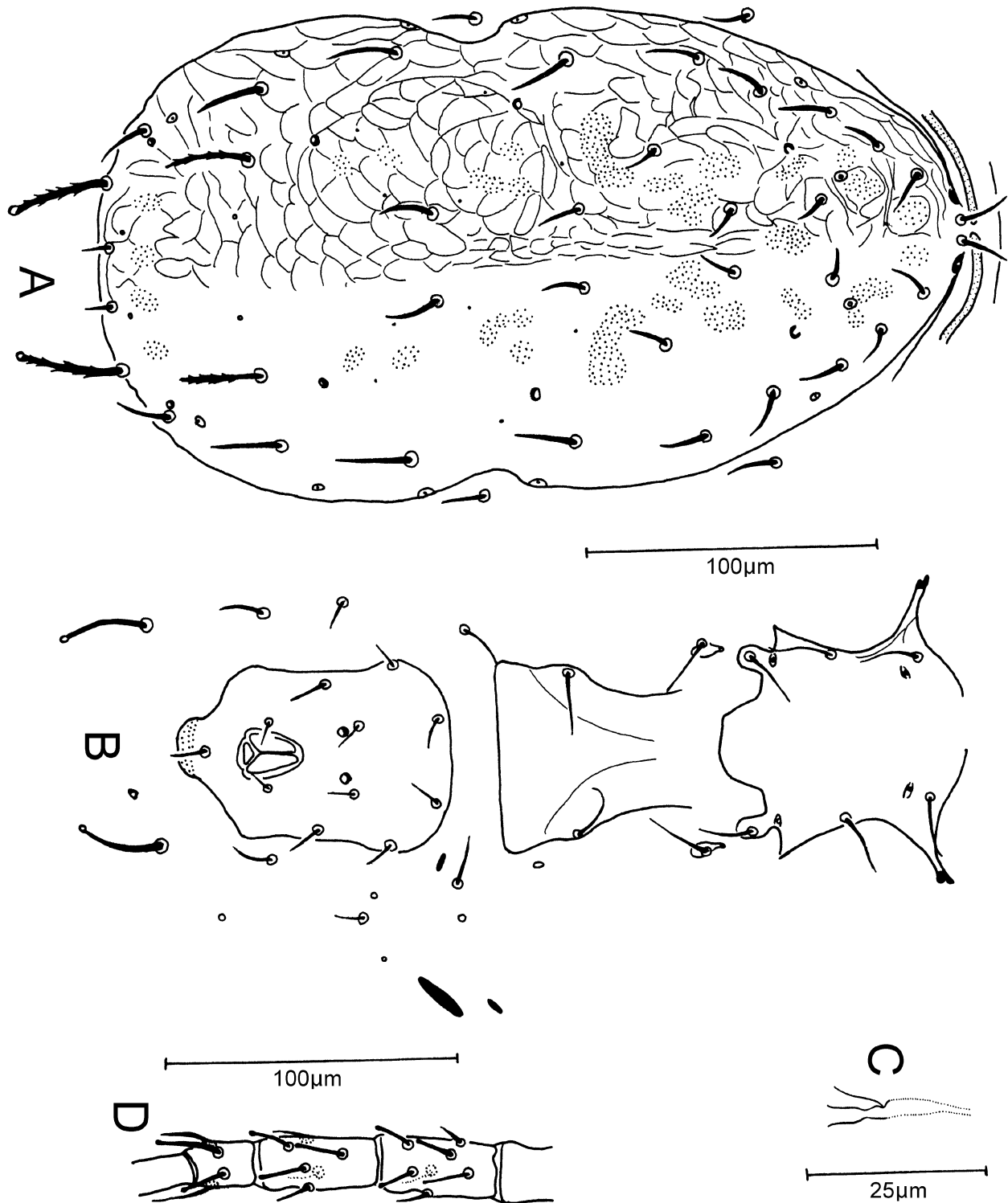
*Typhlodromus combretum* McMurtry & Moraes, 1991: 23.

*Amblydromella (Aphanoseia) combretum*, Denmark & Welbourn, 2002: 308.

*Typhlodromus (Anthoseius) combretum*, Moraes *et al.*, 2004: 318; Chant & McMurtry, 2007: 152.

**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield reticulate; dorsal setae stout and slightly serrate; setae r3 and R1 inserted on integument; sternal shield indistinct; ventrianal shield subquadrate, with 4 pairs of pre-anal setae (seta JV3 present); calyx of spermatheca saccular, constricted next to vesicle; peritreme extending to level of j1; fixed cheliceral digit apparently with 4 teeth and movable digit apparently with 1 to 2 teeth; with knobbed macrosetae only on genu, tibia and basitarsus of leg IV. Described from specimens collected from Huange National Park, Zimbabwe, on *Combretum* sp. No additional specimens were collected in the present study.

**World distribution.** Zimbabwe.



**FIGURE 11.** *Typhlodromus (Anthoseius) constrictus* Zannou, Moraes & Oliveira, n. sp. (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

*Typhlodromus (Anthoseius) constrictus* Zannou, Moraes & Oliveira, n. sp.  
(Fig. 11)

**Diagnosis.** This species is characterized by having dorsal shield reticulate, dorsal setae slightly thickened; setae Z4 serrate, Z5 serrate and knobbed; posterior margin of sternal shield with a trapezoidal median projec-

tion; ventrianal shield with 4 pairs of pre-anal setae (seta JV3 present); caudoventral seta JV5 smooth and knobbed; calyx of spermatheca bell-shaped, constricted near atrium, then flaring near atrium; portion of major duct close to atrium at least as wide as calyx; one macroseta on basitarsus of leg IV.

FEMALE. (4 specimens measured). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield 305 (296–318) long and 171 (165–178) wide, strongly reticulate. With 5 pairs of solenostomes. Setae j1 20 (19–21), j3 19 (19–20), j4 13 (13–14), j5 14 (14–15), j6 16 (16–17), J2 20 (20–21), J5 9 (8–10), z2 16 (15–17), z3 18 (18–19), z4 19 (18–20), z5 15 (14–15), Z4 29 (29–30), Z5 36 (35–39), s4 20 (20–21), s6 22 (22–23), S2 24 (24–25), S4 26 (25–26), S5 18 (17–20), r3 17 (16–19), R1 16 (16–17). Setae smooth and sharp-tipped, except Z4, serrate, and Z5, serrate and knobbed. None of these setae set on tubercles.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a trapezoidal median projection; distances between ST1–ST3 61 (59–64), ST2–ST2 56. Genital shield smooth; distance between ST5–ST5 57 (56–59). Ventrianal shield smooth, pentagonal, with anterior margin convex, 97 (93–99) long, 70 (68–73) wide at level of ZV2, 59 (55–63) wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except for JV5, knobbed.

Chelicera. Movable digit 27 (27–28) long, with 3 teeth; fixed digit 25 long, with 4–5 teeth.

Spermatheca. Calyx tubular, abruptly constricted near atrium, 8 long; atrium distinct.

Legs. Macroseta knobbed: St IV 22. Genu, tibia and tarsus of leg IV with 4, 3 and 1 (in the latter, in addition to the macroseta) knobbed setae, respectively. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype and 2 paratype females from *Parkia biglobosa*, Djougou, Département de l'Atacora, Benin, 30-VI-1992, A. Onzo, deposited at ESALQ-USP; 1 paratype female from the same plant and location, 2-IX-1992, B. Eklou, deposited at IITAIM.

**Etymology.** The name *constrictus* refers to the constriction of the calyx of the spermatheca of this species.

**Remarks.** *Typhlodromus* (*A.*) *crassus* Van der Merwe differs by having setae J2, Z4, Z5, S2 and S4 inserted on tubercles and by having a macroseta on genu of leg IV. *Typhlodromus* (*A.*) *acaciae*, *T. (A.) gutierrezii* Blommers and *T. (A.) apoxys* also differ by not having calyx of spermatheca constricted near atrium, by having major duct narrower than calyx, and by lacking knobbed setae on leg IV in addition of the macroseta.

### *Typhlodromus* (*Anthoseius*) *crassus* Van der Merwe (Fig. 12)

*Typhlodromus* (*Anthoseius*) *crassus* Van der Merwe, 1968: 50; Moraes *et al.*, 2004: 320; Chant & McMurtry, 2007: 152.

*Typhlodromus* (*Typhlodromus*) *crassus*, Tseng, 1983: 67.

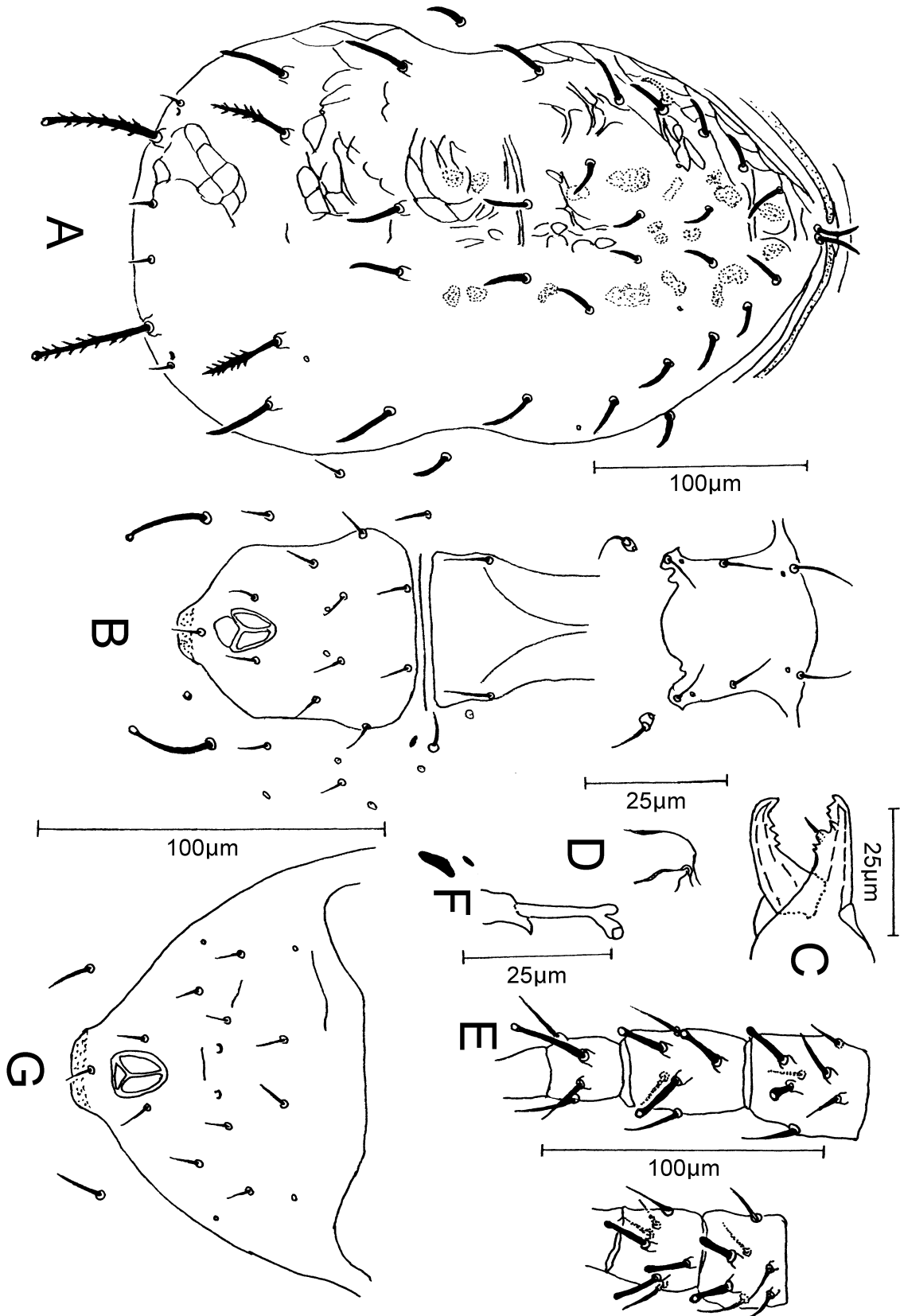
*Amblydromella crassa*, Moraes *et al.*, 1986: 160.

*Amblydromella* (*Amblydromella*) *crassa*, Denmark & Welbourn, 2002: 307.

FEMALE. (Specimens measured—South Africa: holotype, 3 paratypes and 5 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 328 (309–353) [325] long and 192 (173–205) [195] wide, lightly reticulate. With 5 pairs of solenostomes. Setae j1 19 (17–22) [21], j3 19 (17–21) [19], j4 14 (12–16) [15], j5 16 (13–18) [17], j6 17 (14–21) [18], J2 21 (18–23) [21], J5 10 (9–11) [9], z2 16 (13–20) [20], z3 18 (16–21) [19], z4 19 (15–22) [22], z5 16 (14–19) [16], Z4 33 (28–40) [30], Z5 59 (50–64) [52], s4 20 (17–23) [22], s6 24 (21–28) [25], S2 26 (20–32) [25], S4 28 (20–35) [24], S5 15 (11–19) [19], r3 16 (15–20) [20], R1 16 (15–20) [19]. Setae smooth, stout and sharp-tipped, except Z4, serrate, and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.



**FIGURE 12.** *Typhlodromus (Anthoseius) crassus* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin convex; distances between ST1-ST3 56 (52–62) [55], ST2-ST2 56 (51–62) [53]. Genital shield smooth; distance between ST5-ST5 60 (54–65) [58]. Ventrianal shield smooth, pentagonal, with anterior margin straight, 107 (97–119) [103] long, 92 (84–103) [84] wide at level of ZV2, 81 (74–89) [86] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 25 (21–29) [25] long, with 3 teeth; fixed digit 24 (21–29) [22] long, with 5 teeth. Spermatheca. Calyx cup-shaped, short and broad, 9 (8–10) long; atrium small.

Legs. Macrosetae generally knobbed (sometimes sharp-tipped); Sge IV 12 (6–18), St IV 27 (24–31) [24]. Genu (in addition to macroseta) and tibia of leg IV and genu of leg III with 1, 2 and 2 knobbed setae, respectively. In some specimens, those setae on genua III and IV are sharp-tipped but longer than other setae on these segments. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 2)

Dorsum. Dorsal shield pattern and setae as in female, 241 (235–246) long and 139 (134–143) wide. Setae j1 13 (12–14), j3 15, j4 10, j5 12 (11–12), j6 14 (13–14), J2 16 (15–16), J5 10 (9–10), z2 14 (13–14), z3 15, z4 14, z5 13 (12–13), Z4 25 (24–26), Z5 40 (39–41), s4 15 (14–15), s6 17 (16–17), S2 18 (17–19), S4 18 (17–19), S5 11 (10–11), r3 14, R1 15.

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular; mostly smooth, with few striae, fused with peritrematal shields; 90 (87–92) long, 124 (121–126) wide at the anterior corners; with 4 pairs of pre-anal setae and 2 distinguishable pairs of lyrifissures (1 anterior to JV1, 1 lateral and posterior to ZV2); round pre-anal pores slightly posterior and mesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Forked distally, with one member of fork knobbed, shaft 18 (17–19) long.

Legs. Macrosetae blunt on leg III and knobbed on leg IV; Sti III 14, 11 (10–12), Sge IV 10, Sti IV 14, St IV 18 (17–19). Chaetotaxy of genua II and III as in female.

**Specimens examined.** **South Africa:** Holotype female, Kwazulu/Natal Province, Munster, on *Phoenix reclinata*, 14-IV-1955, M.K.P. Smith Meyer; 2 paratype females, Kwazulu/Natal Province, Shelly Beach, on a plant species of the family Compositae, 13-V-1965, M.K.P. Smith Meyer; 1 paratype female from Kwazulu/Natal Province, Richards Bay, on unidentified plant, 29-XI-1962, G.G. van der Merwe; 1 female and 2 males, Kwazulu/Natal Province, Giant's Castle Nature Reserve, on *Myrsine africana*, 3-II-1982, M.K.P. Smith Meyer; 1 female, Free State Province, Golden Gate National Park, on *Pyrus* sp., 10-II-1982, E.A. Uecker-mann; 1 female, Kwazulu/Natal Province, Loteni Nature Reserve, on *Kiggelaria africana*, 17-I-1991, S. Nesor; 1 female, Kwazulu/Natal, Mkhomazi State Forest, on *Malus* sp., 19-I-1991, M.K.P. Smith Meyer; 1 female, Kwazulu/Natal, Ramsgate, on *Chromolaena odorata*, 3-IX-1990, E.A. Uecker-mann.

**World distribution.** South Africa.

***Typhlodromus (Anthoseius) daresalaami* El-Banhawy & Abou-Awad**  
(Fig. 13)

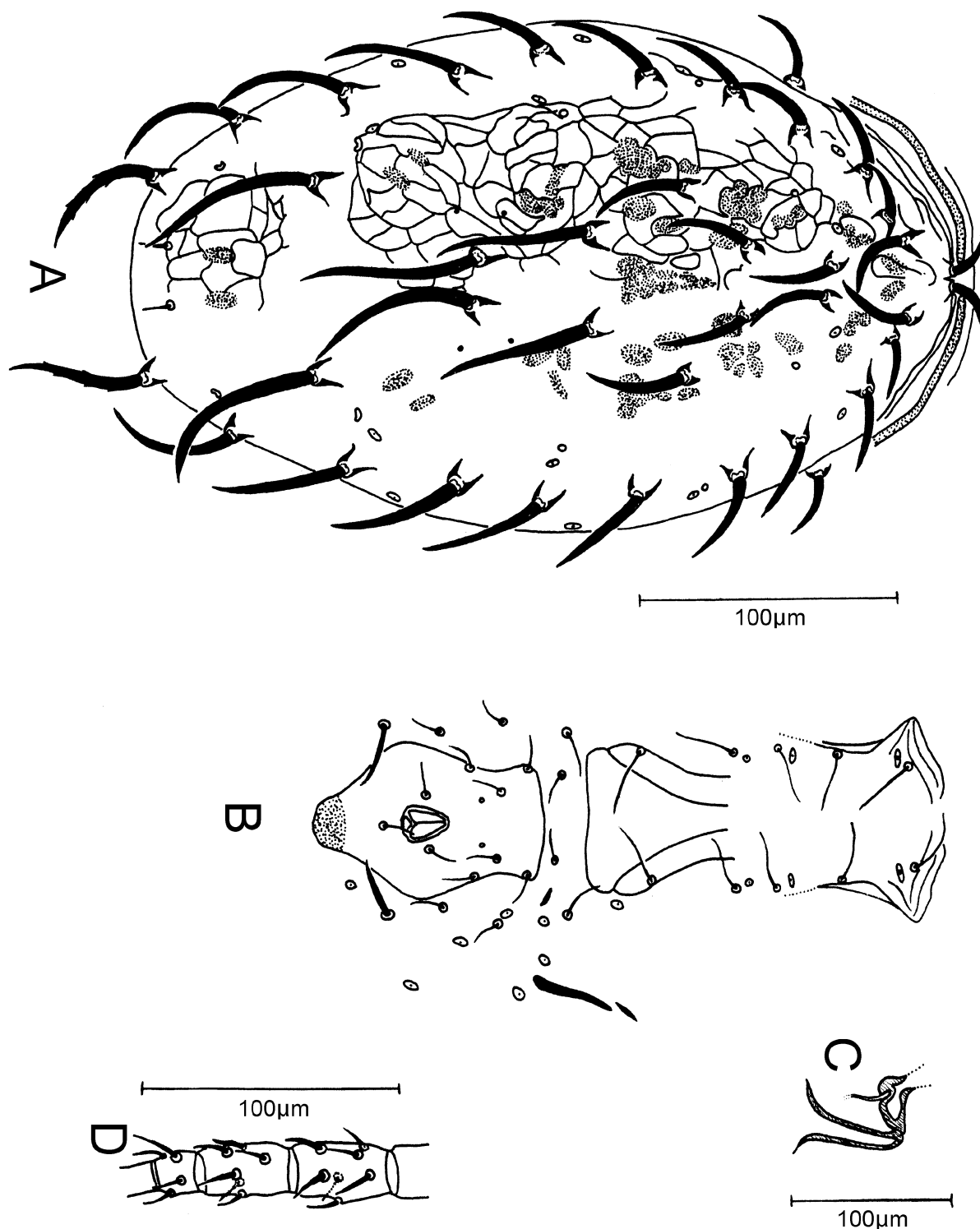
*Typhlodromus daresalaami* El-Banhawy & Abou-Awad, 1991: 219.

*Typhlodromus (Anthoseius) daresalaami*, Chant & McMurtry, 1994: 252; Moraes *et al.*, 2004: 320; Chant & McMurtry, 2007: 152.

FEMALE. (Specimen measured—Burundi: 3; Malawi: 1). Idiosomal setal pattern: 12A:8A/JV: ZV.

Dorsum. Dorsal shield 311 (304–315) long and 172 (163–182) wide, reticulate centrally. With 5 pairs of solenostomes. Setae j1 20 (18–22), j3 28 (24–30), j4 32, j5 36 (35–37), j6 54 (51–56), J2 65 (64–67), J5 13 (11–16), z2 24 (22–26), z3 33 (32–37), z4 34 (32–36), z5 38 (37–40), Z4 73 (70–74), Z5 50 (46–54), s4 37

(34–41), s6 40 (37–45), S2 49 (45–54), S4 52 (50–54), S5 47 (45–51), r3 31 (29–35), R1 39 (37–45). Setae thorn-like, smooth and inserted on tubercles, except J5, short and setiform, and Z5, serrate.



**FIGURE 13.** *Typhlodromus (Anthoseius) daresalaami* El-Banhawy & Abou-Awad (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

Peritreme. Extending to level of j1.

Venter. Sternal shield mostly smooth, with few anterolateral striae and 3 pairs of setae, posterior margin indistinct; distances between ST1–ST3 56 (54–56), ST2–ST2 48 (46–50). Genital shield smooth; distance between ST5–ST5 50 (46–51). Ventrianal shield smooth, vase-shaped, with anterior margin slightly convex,



81 (77–85) long, 41 (40–42) wide at level of ZV2, 54 (51–59) wide at level of anus, with 3 pairs of pre-anal setae (seta JV1 on integument; seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Position renders examination impossible.

Spermatheca. Calyx funnel-shaped, 22 (19–25) long; atrium bulbous, vacuolate.

Legs. Macroseta sharp-tipped: St IV 18 (16–22). Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Specimens examined. Malawi:** 1 female from *Ficus exasperata*, 10 km SSE Chiweta, Northern Province, 6-V-2000, B. Eklou. **Burundi:** 3 females from unknown locality and substrate.

**Remarks.** Differently from what is mentioned in the original description of this species, the specimens examined in this work have j3 slightly longer than j1.

**World distribution.** Burundi, Malawi and Tanzania.

### *Typhlodromus (Anthoseius) denheyeri* Zannou, Moraes & Oliveira, n. sp.

(Fig. 14)

**Diagnosis.** This species is distinct by having dorsal shield reticulate; dorsal setae smooth and sharp-tipped, except Z4 and Z5, lanceolate and serrate, and Z5 knobbed; seta Z4 as long as distance between its base and the base of S4; seta S5 about half as long as S4; sternal shield with 3 pairs of setae and with a convex posterior margin; a single and knobbed macroseta on basitarsus of leg IV.

FEMALE. (7 specimens measured). Idiosomal setal pattern: 12A:8A/JV: ZV.

Dorsum. Dorsal shield 303 (293–323) long and 180 (168–186) wide, reticulate. With 5 pairs of solenostomes. Setae j1 18 (14–22), j3 21 (19–27), j4 17 (14–19), j5 16 (14–21), j6 21 (18–24), J2 23 (19–27), J5 10 (8–11), z2 18 (16–19), z3 20 (18–22), z4 22 (19–24), z5 19 (16–22), Z4 36 (30–42), Z5 46 (40–51), s4 24 (22–27), s6 26 (24–29), S2 28 (26–30), S4 29 (27–32), S5 15 (13–18), r3 19 (16–21), R1 19 (16–21). Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

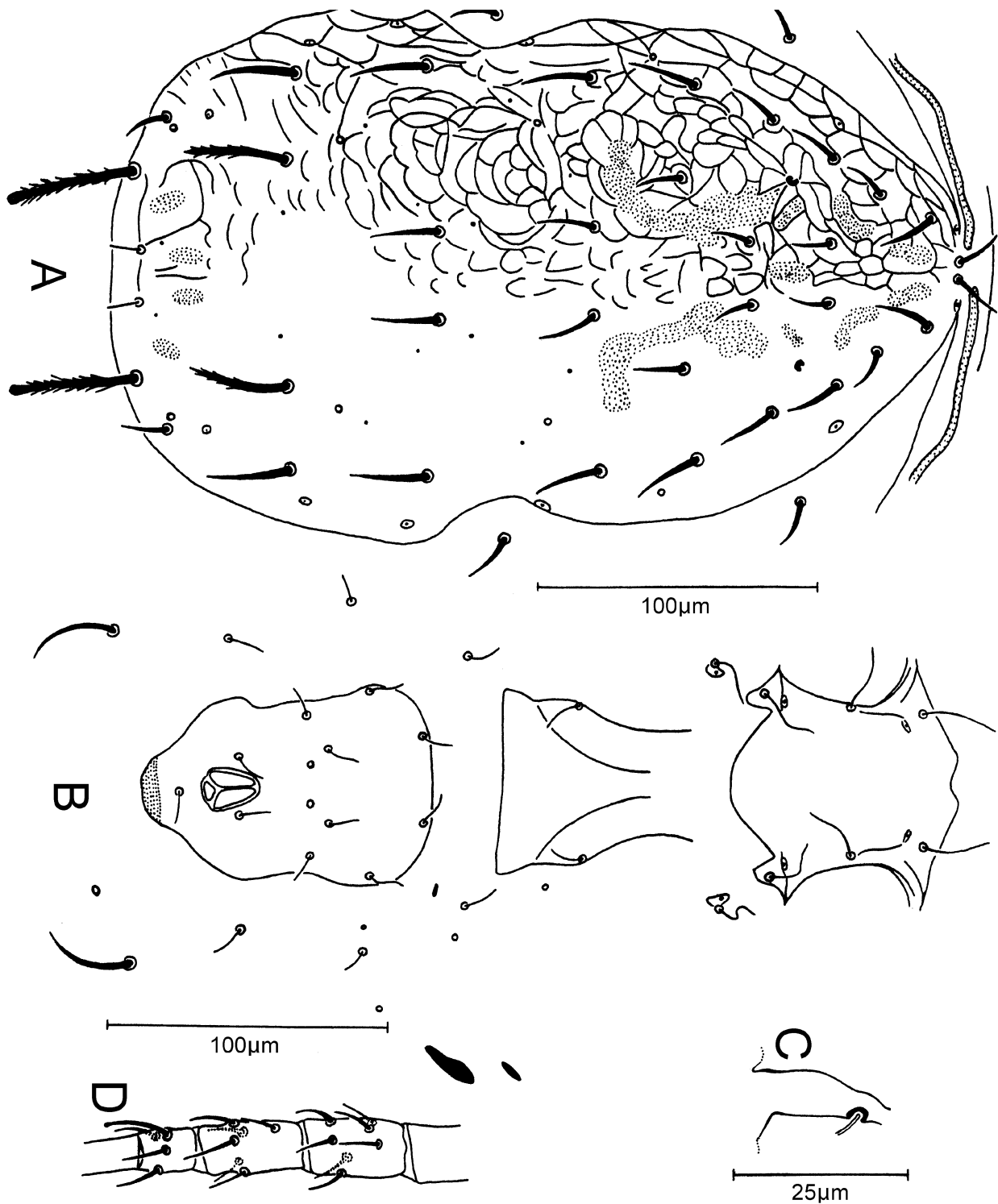
Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin apparently convex; distances between ST1–ST3 55 (53–58), ST2–ST2 52 (51–54). Genital shield smooth; distance between ST5–ST5 57 (54–59). Ventrianal shield smooth, pentagonal anterior margin slightly convex, 100 (91–112) long, 73 (64–83) wide at level of ZV2, 67 (59–74) wide at level of anus, with 4 pairs of pre-anal setae (JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except for JV5 that in some specimens is slightly knobbed.

Chelicera. Movable digit 22 long, with 3 teeth; fixed digit 22 long, with 5–6 teeth.

Spermatheca. Calyx saccular, 13 (13–14) long; atrium distinct.

Legs. Macroseta knobbed: St IV 24 (22–27). Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female from unknown plant, 25 km NE Gitega, Préfecture de Karuzi, Burundi, 12-XII-1989, J.S. Yaninek, deposited at ESALQ-USP; 1 paratype female from *Euphorbia tirucalli*, 16 km NW Bujumbura, Burundi, 11-XII-1989, J.S. Yaninek, deposited at ESALQ-USP; 1 paratype female from *Croton floribundus*, 84 km NE Bujumbura, Burundi, 12-XII-1989, J.S. Yaninek, deposited at IITAIM; 4 paratype females from *Lantana camara*, 19 km S Kisumu, Nyanza Province, Kenya, 3-XII-1989, J.S. Yaninek, deposited at IITAIM; 1 paratype female from *Cassia* sp., 19 km S Kisumu, Nyanza Province, Kenya, 3-XII-1989, J.S. Yaninek, deposited at ESALQ-USP; 2 paratype females from *Greewillea robusta*, ISAR Station, Karama, Rwanda, 9-XII-1989, J.S. Yaninek, deposited at ESALQ-USP; 1 paratype female from *Jacaranda mimosifolia*, ISAR Station, Karama, Rwanda, 9-XII-1989, J.S. Yaninek, deposited at ESALQ-USP; 1 paratype female from unknown plant, Moyamba, Gbangbama 10 miles, Sierra-Leone, 17-I-1992, M.M. Bocharie, deposited at IITAIM; 1 paratype female from *Ficus exasperata*, 4 km SE Kafu River, Luwero, Uganda, 13-X-1990, J.S. Yaninek, deposited at IITAIM.



**FIGURE 14.** *Typhlodromus (Anthoseius) denheyeri* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

**Etymology.** This species is named in honor of the eminent South African acarologist Jacob Den Heyer.

**Remarks.** Specimens from Kenya, Sierra-Leone and Uganda have seta JV5 moderately knobbed, whereas this seta is sharp-tipped in specimens from Rwanda and in 2 of specimens from Burundi. *Typhlodromus (A.) persianus* McMurtry differs from this species by having Z4 as long as the distance between its base and the base of S5, the latter about 0.7 as long as S4, 2 pairs of setae on sternal shield (ST3 on integument)

and 4 teeth on the fixed cheliceral digit. *Typhlodromus (A.) gutierrezii* Blommers differs from the new species by having posterior margin of sternal shield almost straight, calyx of spermatheca half as long as in the new species and by having macrosetae on genu and tibia of leg IV. *Typhlodromus (A.) wrenschae* Ueckermann & Loots also differs from the new species by having seta Z4 0.7 times as long as the distance between its base and the base of S4 and by having ST3 inserted on integument.

***Typhlodromus (Anthoseius) drymis* Ueckermann & Loots**

(Fig. 15)

*Typhlodromus (Anthoseius) drymis* Ueckermann & Loots, 1988: 48; Moraes *et al.*, 2004: 322; Chant & McMurtry, 2007: 152.

*Amblydromella (Aphanoseia) drymis*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 2 paratypes and 2 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV

Dorsum. Dorsal shield 355 (343–368) [358] long and 194 (171–206) [206] wide; reticulate. With 5 pairs of solenostomes. Setae j1 26 (23–27) [27], j3 23 (21–25) [25], j4 16 (13–17) [13], j5 16 (14–19) [17], j6 19 (17–22) [18], J2 22 (19–27) [23], J5 11 (10–12) [10], z2 17 (15–21) [17], z3 22 (20–26) [21], z4 23 (21–26) [22], z5 17 (15–20) [17], Z4 35 (30–40) [35], Z5 57 (53–67) [56], s4 25 (24–27) [25], s6 27 (25–29) [27], S2 28 (26–34) [28], S4 30 (27–38) [29], S5 18 (15–20) [18], r3 23 (23–25) [22], R1 21 (19–23) [21]. Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin indistinct; distances between ST1–ST3 63 (59–66) [64], ST2–ST2 60 (56–64) [63]. Genital shield smooth; distance between ST5–ST5 58 (54–61) [61]. Ventrianal shield smooth, pentagonal, with anterior margin slightly convex, 112 (104–119) [119] long, 89 (82–100) [100] wide at level of ZV2, 80 (75–83) [83] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, blunt.

Chelicera. Movable digit 27 (24–29) long, with 3 teeth; fixed digit 29 (27–30) long, with 6 teeth.

Spermatheca. Calyx cup-shaped, short and broad, 11 (10–12) [12] long, atrium incorporated in calyx.

Legs. Macrosetae knobbed; Sge IV 20 (19–22) [20], Sti IV 23 (22–25) [25], St IV, 37 (32–44) [44]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 1)

Dorsum. Dorsal shield pattern and setae as in female, 250 long and 125 wide. Setae j1 16, j3 20, j4 13, j5 16, j6 16, J2 21, J5 10, z2 18, z3 18, z4 19, z5 15, Z4 27, Z5 41, s4 18, s6 22, S2 25, S4 22, S5 12, r3 20, R1 17.

Peritreme. Extending almost to level of j1.

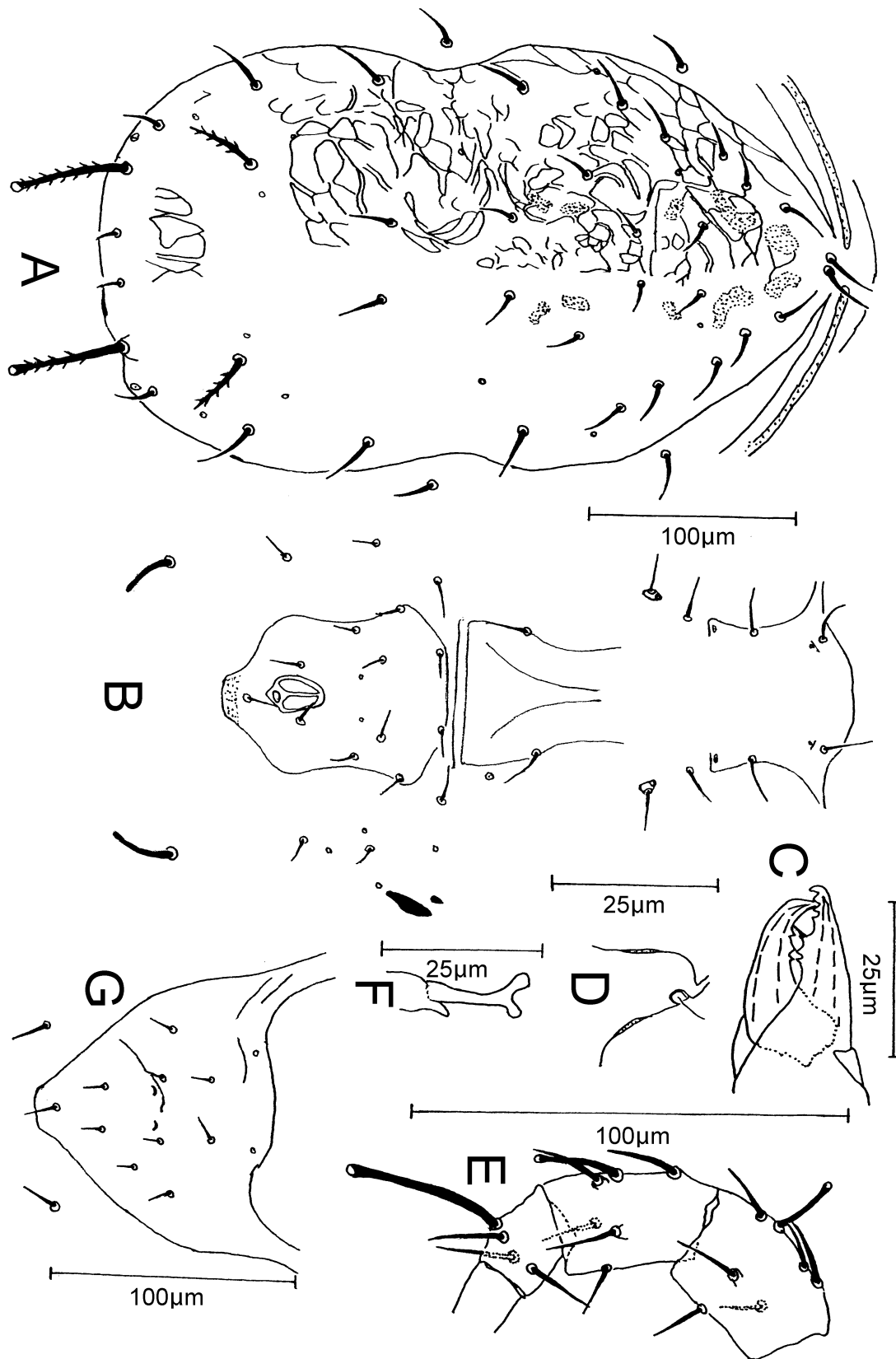
Venter. Ventrianal shield subtriangular, mostly smooth, with few striae, fused with peritrematal shields, 101 long, 120 wide at anterior corners; with 4 pairs of pre-anal setae and 1 distinguishable pair of lyrifissures (anterior to JV1); round pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Forked distally, both members of fork knobbed, shaft 16 long.

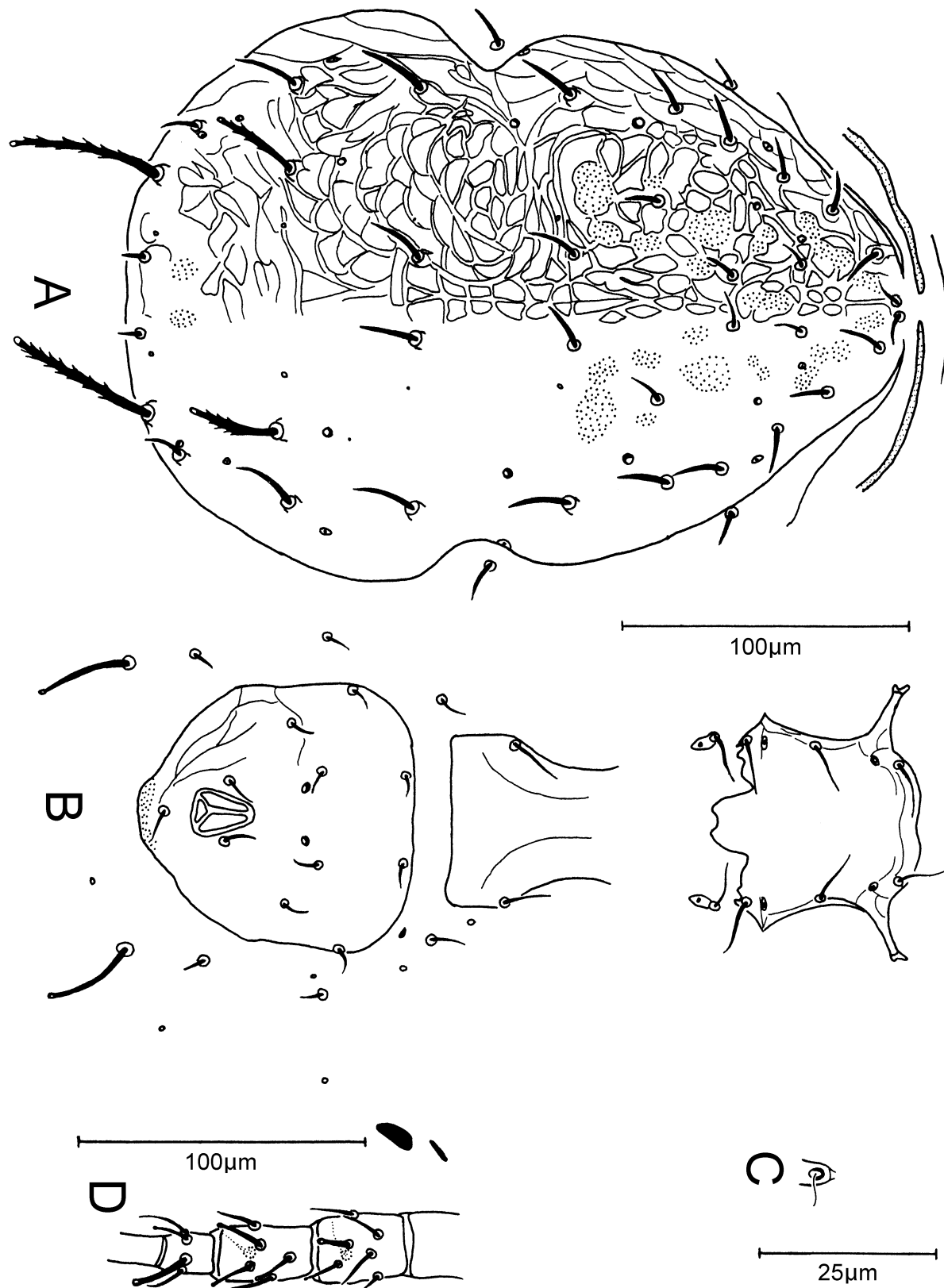
Legs. Macrosetae knobbed; Sge IV 13, Sti IV 17, St IV 24. Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female, Western Cape Province, Libanon Forestry, on *Stoebe plumosa*, 9-III-1983, S. Cruickshank; 1 paratype female, Western Cape Province, Silvermine Nature Reserve near Cape Town, on *Pinus* sp., 8-III-1983, D.P. Keetch; 1 paratype female from Western Cape Province, Houwhoek Pass, on unidentified plant, 9-III-1983, D.P. Keetch; 1 female, Western Cape Province, Cape Point Nature Reserve, on *Plectostachys serpyllifolia*, 4-III-1976, M.K.P. Smith Meyer; 1 female and 1 male,

**World distribution.** South Africa.



**FIGURE 15.** *Typhlodromus (Anthoseius) drymis* Ueckermann & Loots: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.



**FIGURE 16.** *Typhlodromus (Anthoseius) elaeis* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

***Typhlodromus (Anthoseius) elaeis* Zannou, Moraes & Oliveira, n. sp.**

(Fig. 16)

**Diagnosis.** This species is distinct by having dorsal shield strongly reticulate, setae Z4 and Z5 serrate and knobbed; setae J2, Z4, Z5, s6, S2, S4 and S5 inserted on small tubercles; sternal shield with 3 pairs of setae; ventrianal shield quadrate, with lateral margins almost straight, as long as wide; calyx of spermatheca cup-shaped and very short.

FEMALE. (1 specimen measured). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield, 268 long and 187 wide, strongly reticulate. With 5 pairs of solenostomes. Setae j1 14, j3 16, j4 13, j5 13, j6 19, J2 22, J5 10, z2 17, z3 18, z4 19, z5 16, Z4 31, Z5 54, s4 19, s6 23, S2 25, S4 23, S5 14, r3 12, R1 16. Setae smooth, except for Z4 and Z5, serrate and knobbed. Setae J2, Z4, Z5, s6, S2, S4 and S5 inserted on small tubercles.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae (ST4 on separate shields); posterior margin with a bi-dentate median protuberance; distances between ST1-ST3 52, ST2-ST2 50. Genital shield smooth; distance between ST5-ST5 56. Ventrianal shield pentagonal, mostly smooth, with some striae around anus, with anterior margin straight, 95 long, 96 wide at level of ZV2, 91 wide at level of anus, with 4 pairs of pre-anal setae (JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 23 long; fixed digit 21 long; position did not allow counting number of teeth on either digit.

Spermatheca. Calyx cup-shaped, 3 long; atrium small, incorporated to calyx.

Legs. Macrosetae knobbed: Sge III 8, Sge IV 12, St IV 22. Tibia III as well as genu, tibia and tarsus IV have 2, 1, 3 and 1 knobbed setae, respectively, in addition to macrosetae. Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female from *Elaeis guineensis*, 27 km SW Ngoulemakong, Cameroon, 6-II-1991, L. Louis.

**Etymology.** The name *elaeis* refers to the genus of the plant from which the holotype of this species was collected.

**Remarks.** *Typhlodromus (A.) crassus* differs from this species by having seta Z4 sharp-tipped, ventrianal shield pentagonal, longer than wide and calyx of the spermatheca 3 times longer than in the new species.

***Typhlodromus (Anthoseius) eremicus* Meyer & Ueckermann**

(Fig. 17)

*Typhlodromus eremicus* Meyer & Ueckermann, 1989: 3.

*Amblydromella (Prasadoseia) eremica*, Denmark & Welbourn, 2002: 297.

*Typhlodromus (Anthoseius) eremicus*, Moraes *et al.*, 2004: 323; Chant & McMurtry, 2007: 152.

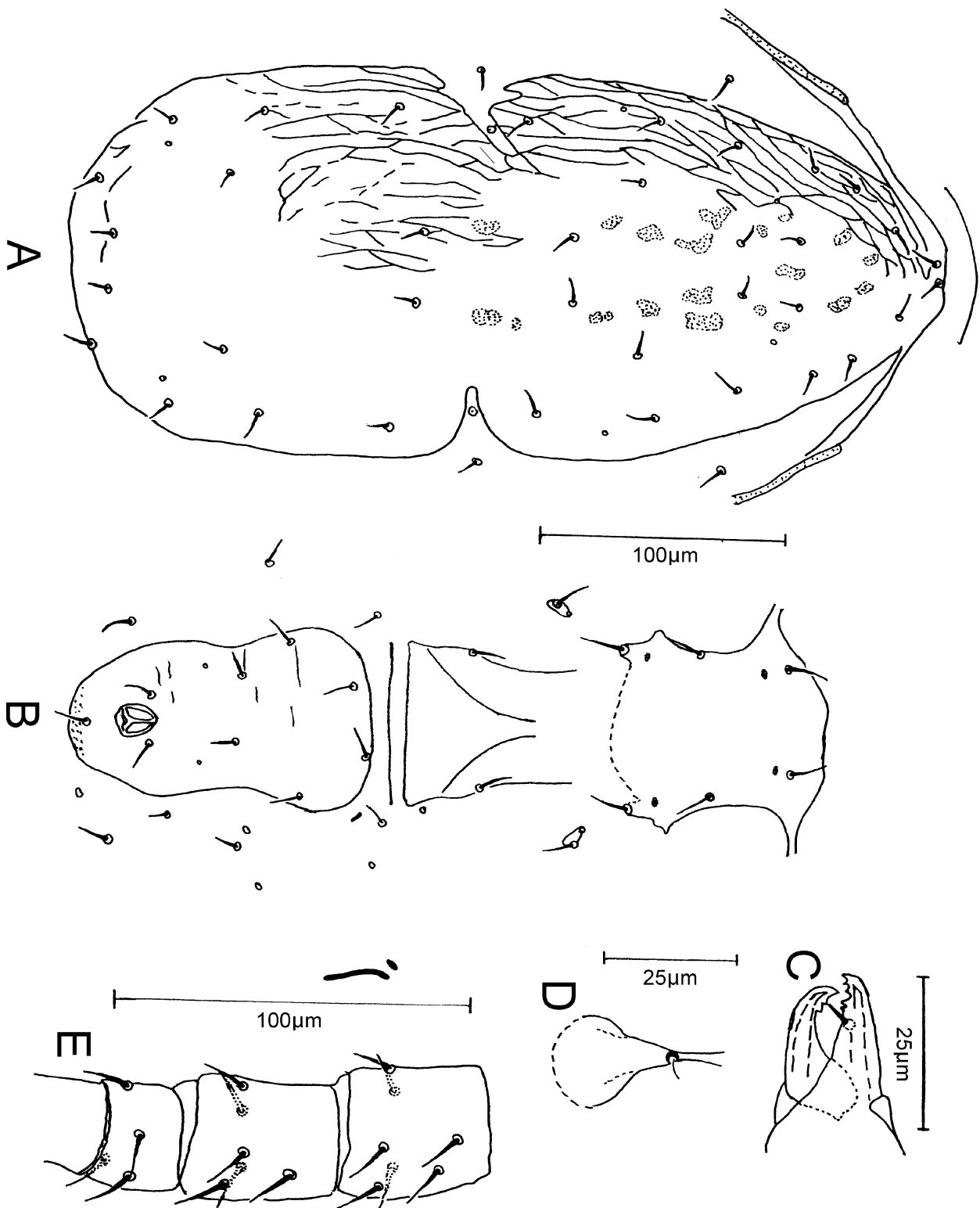
FEMALE. (Specimens measured—South Africa: holotype). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Schizodorsal shield 358 long and 164 wide; laterally reticulate from seta j1 to level of seta R1 and completely reticulate from the level of R1 to seta S2. With 5 pairs of solenostomes gd6 not indicated in fig. 17A. Setae j1 11, j3 11, j4 19, j5 9, j6 9, J2 9, J5 8, z2 12, z3 11, z4 13, z5 10, Z4 10, Z5 15, s4 11, s6 13, S2 10, S4 9, S5 10, r3 11, R1 9. All setae very short, smooth and sharp-tipped.

Peritreme. Extending almost to level of z2.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin convex; distances between ST1-ST3 66, ST2-ST2 57. Genital shield smooth; distance between ST5-ST5 53. Ventrianal shield smooth, slightly

waisted and rectangular, with anterior margin convex, 123 long, 76 wide at level of ZV2, 64 wide at level of anus; with 3 pairs of pre-anal setae (seta JV3 absent); round pre-anal pores posterolaterad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth.



**FIGURE 17.** *Typhlodromus (Anthoseius) eremicus* Meyer & Ueckermann (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

Chelicera. Movable digit 22 long, with 2 teeth; fixed digit 21 long, with 4 teeth.

Spermatheca. Calyx funnel-shaped, wrongly depicted by Smith Meyer & Ueckermann (1989), 15 long.

Legs. Leg IV without macrosetae. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female, Northern Cape Province, Dune road to Eland, Kgalagadi Gemsbok National Park, on an unidentified herb, 6-II-1987, M.K.P. Smith Meyer.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) februs* Van der Merwe

(Fig. 18)

*Typhlodromus (Anthoseius) februs* Van der Merwe 1968: 37; Moraes *et al.*, 2004: 323; Chant & McMurtry, 2007: 152.

*Amblydromella febra*, Moraes *et al.*, 1986: 161.

*Amblydromella (Aphanoseia) febra*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 3 paratypes and 1 additional specimen). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 346 (333–361) [361] long and 206 (202–212) [206] wide; reticulate medially between j1 and Z4 and striate elsewhere. With 5 pairs of solenostomes not indicated in Fig. 18A. Setae j1 17 (16–18) [17], j3 19 (17–21) [21], j4 14 (12–16) [16], j5 14 (11–16) [16], j6 18 (16–20) [20], J2 21 (20–23) [23], J5 11 (10–12) [11], z2 17 (17–18) [18], z3 19 (17–20) [19], z4 20 (18–21) [20], z5 16 (14–17) [17], Z4 25 (24–25) [25], Z5 45 (43–46) [46], s4 21 (19–22) [22], s6 23 (22–25) [23], S2 24 (24–25) [25], S4 27 (24–29) [29], S5 25 (24–28) [28], r3 20 (19–21) [21], R1 17 (16–19) [19]. Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate, narrowing distally but ending bluntly; J2, Z4, Z5, R1 and most of lateral setae inserted on tubercles.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a wedge-shaped median protuberance; distances between ST1–ST3 60 (57–67), ST2–ST2 45 (44–47). Genital shield smooth, distance between ST5–ST5 53 (51–54). Ventrianal shield mostly smooth, with scattered striae posteriorly to JV2, pentagonal, with anterior margin almost straight, 106 (103–108) [103] long, 85 (83–88) [86] wide at level of ZV2, 84 (81–86) [83] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 21 (20–22) [22] long, with 1 tooth; fixed digit 24 (21–26) [25] long, with 3 teeth.

Spermatheca. Calyx a broad tube, 13 (12–15) long, atrium indistinctly separated.

Legs. Macroseta sharp-tipped; St IV 20 (18–23) [22]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female and 2 paratype females, Limpopo Province, Pafuri, Kruger National Park, on *Acacia xanthophlea*, 9-I-1964, M.K.P. Smith Meyer; 1 paratype female, Limpopo Province, Shingwedzi, Kruger National Park, on *A. xanthophlea*, 13-I-1964, M.K.P. Smith Meyer; 1 female, Kwazulu/Natal Province, Hluhluwe, on *A. xanthophlea*, 21-VIII-1980 M.K.P. Smith Meyer.

**World distribution.** South Africa.

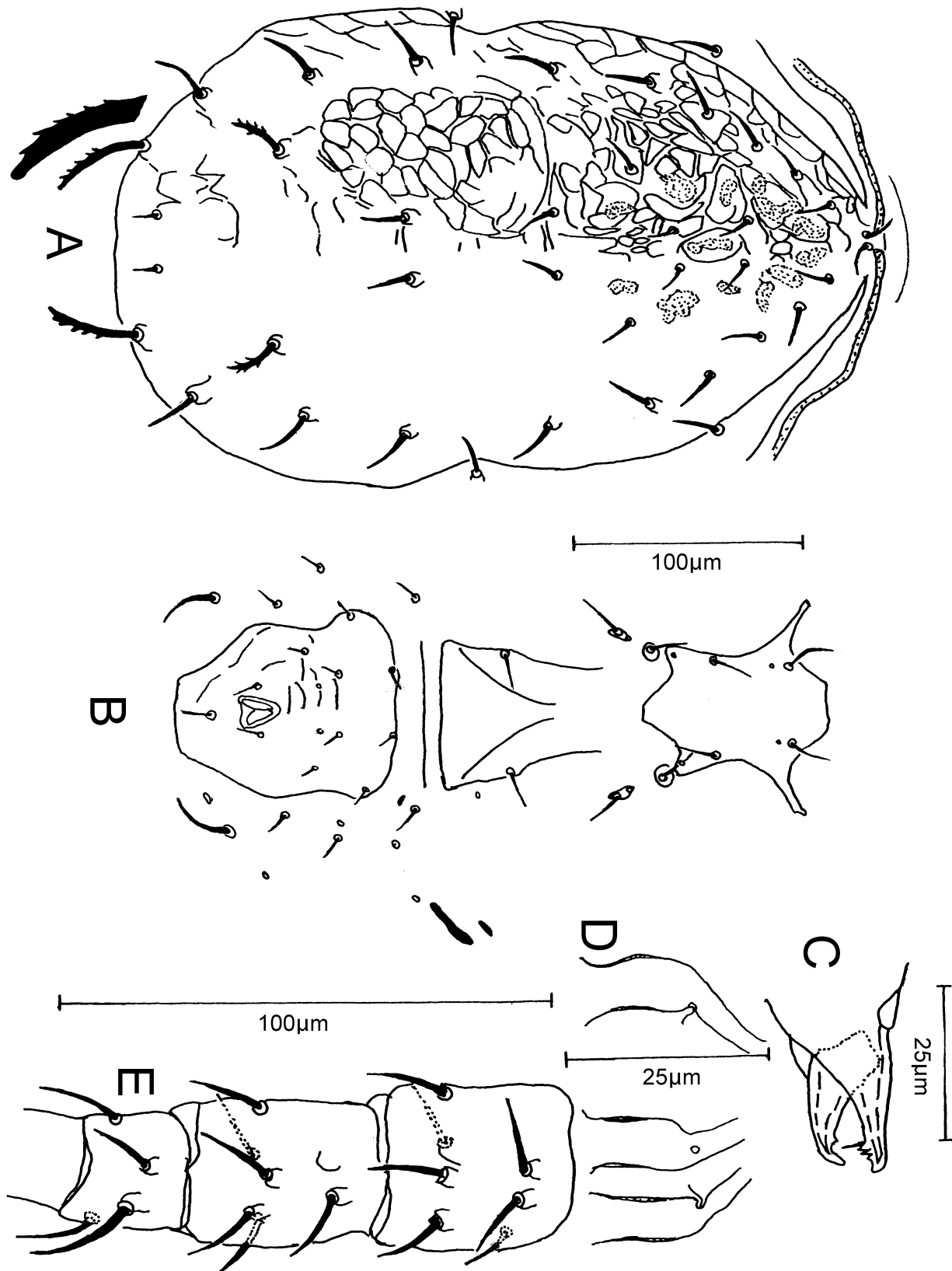
### *Typhlodromus (Anthoseius) galpinii* Ueckermann, Zannou & Moraes, n. sp.

(Fig. 19)

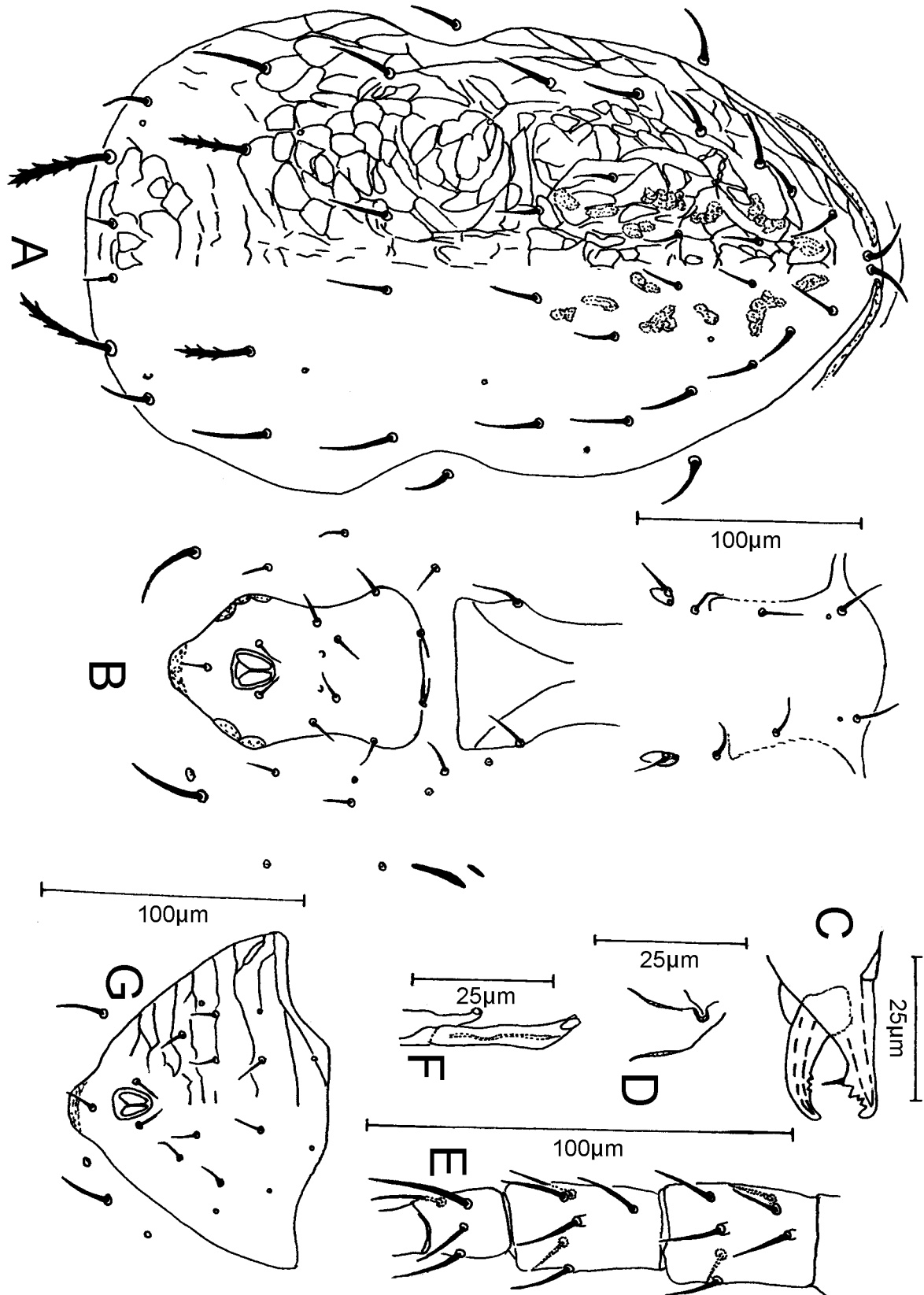
**Diagnosis.** This species is characterized by having dorsal shield reticulate; seta Z4 shorter than the distance



between its base and the base of S5; setae Z4 and Z5 serrate and sharp-tipped; seta S5 about 0.7 times as long as S4; seta S2 about 0.6 time as long as the distance between its base and the base of S4; seta JV5 smooth and sharp-tipped; a single and sharp-tipped macroseta on basitarsus of leg IV.



**FIGURE 18.** *Typhlodromus (Anthoseius) februs* Van der Merwe (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.



**FIGURE 19.** *Typhlodromus (Anthoseius) galpinii* Ueckermann, Zannou & Moraes, n. sp.: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

FEMALE. (5 specimens measured). Idiosomal setal pattern 12A:8A/JV: ZV.

Dorsum. Dorsal shield 348 (338–355) [354] long and 192 (183–199) [194] wide; reticulated. With 5 pairs of solenostomes. Setae j1 21 (19–23) [20], j3 23 (22–23) [23], j4 16 (15–18) [18], j5 17 (16–19) [16], j6 20 (19–21) [19], J2 25 (24–27) [25], J5 11 (11–12) [11], z2 18 (17–20) [18], z3 22 (21–22) [21], z4 22 (22–23) [23], z5 18 (17–19) [19], Z4 33 (31–34) [34], Z5 44 (43–46) [46], s4 24 (23–26) [25], s6 27 (25–28) [28], S2 29 (27–31) [31], S4 32 (31–33) [33], S5 22 (20–23) [23], r3 23 (21–24) [21], R1 22 (21–24) [21]. Setae smooth and sharp-tipped, except Z4 and Z5, serrate.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin partially indistinct; distances between ST1–ST3 60 (57–62) [62], ST2–ST2 50 (49–50) [50]. Genital shield smooth; distance between ST5–ST5 56 (53–59) [58]. Ventrianal shield smooth, pentagonal, with anterior margin straight, 113 (108–116) [116] long, 71 (68–74) [73] wide at level of ZV2 and 68 (65–71) [71] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 24 (23–24) [24] long, with 3 teeth; fixed digit 23 (21–25) [21] long, with 4 teeth.

Spermatheca. Calyx cup-shaped, short, broad, 9 (8–10) [8] long, atrium indistinctly separated.

Legs. Macroseta sharp-tipped; St IV 23. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (3 specimens measured)

Dorsum. Dorsal shield pattern and setae as in female, 264 (259–268) long and 160 (155–164) wide. Setae j1 19 (18–20), j3 16 (15–17), j4 13 (12–14), j5 14 (13–15), j6 16 (15–16), J2 17 (16–18), J5 9 (8–11), z2 16 (15–16), z3 16 (16–17), z4 17 (16–17), z5 15 (14–16), Z4 21 (20–22), Z5 28 (27–30), s4 20 (19–22), s6 19 (18–19), S2 21 (20–22), S4 21 (20–22), S5 16 (15–17), r3 19 (19–20), R1 19 (18–19).

Peritreme. Extending to level between j1 and j3.

Venter. Ventrianal shield subtriangular, reticulate, free from peritrematal shields, 100 (96–104) long, 132 (131–133) wide at the anterior corners; with 4 pairs of pre-anal setae and 3 distinguishable pairs of lyrifissures (1 anterior to JV1, 1 sublateral and almost transversally aligned with JV1, 1 lateral and slightly posterior to ZV2); elliptical pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Straight for most of its extent, slightly bent distally, shaft 26 (25–27) long.

Legs. Macroseta sharp-tipped; St IV 20 (19–22). Chaetotaxy of genua II and III as in female.

**Locality and type material.** Holotype female, 3 paratype females and 2 paratype males, from *Bauhinia galpinii*, Limpopo Province, Die Eiland near Gravelotte, **South Africa**, 25-V-1983, M.K.P. Smith Meyer, deposited at NCA-PPRI; 1 paratype female and one paratype male, from *B. galpinii*, Limpopo Province, Gravelotte River, **South Africa**, 25-V-1983, E. A. Ueckermann, deposited at NCA-PPRI.

**Etymology.** The name *galpinii* refers to the host plant on which the types of this species were found.

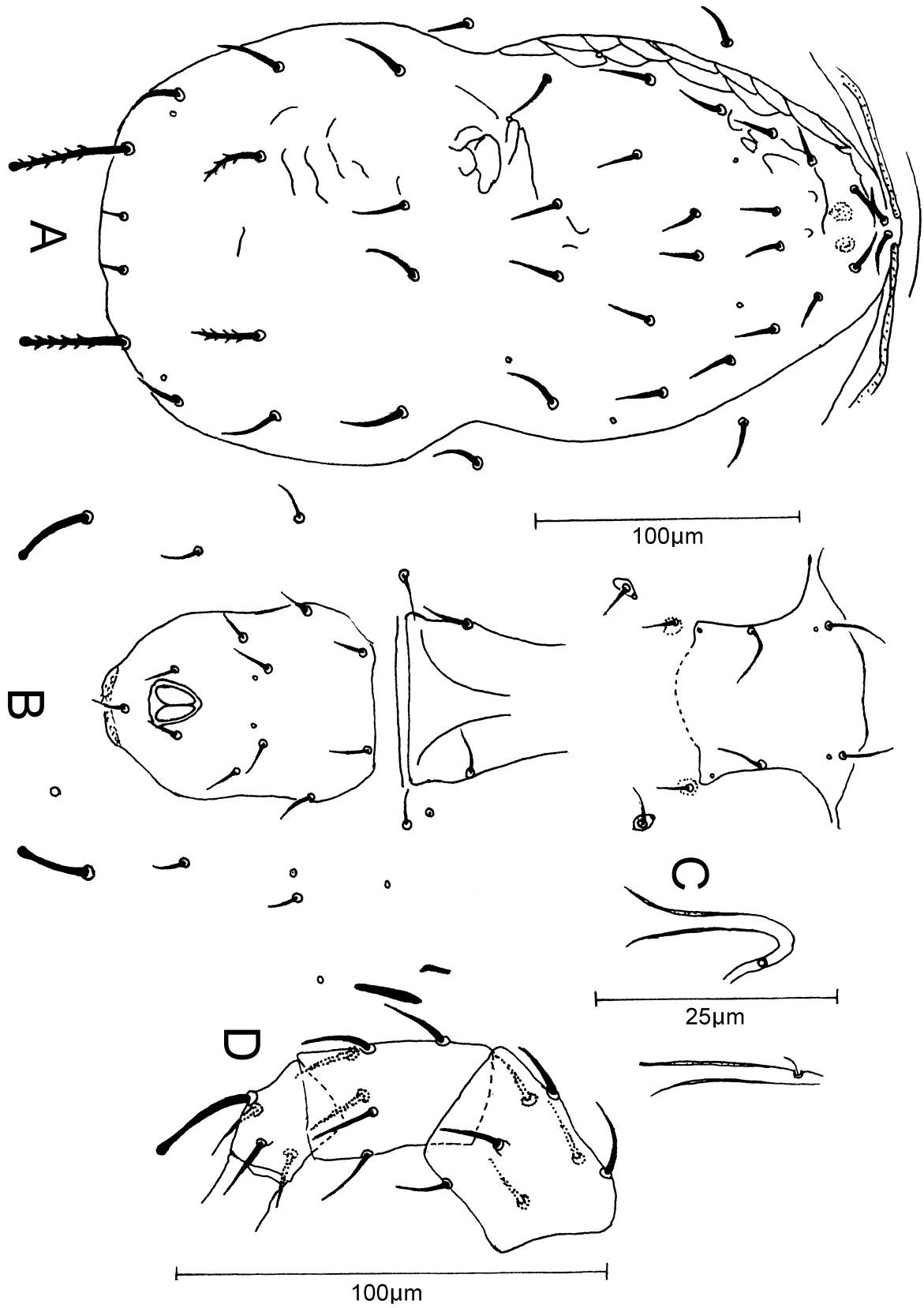
**Remarks.** *Typhlodromus (A.) persianus* (McMurtry) and *T. (A.) theroni* Ueckermann & Loots differ from this new species by having seta Z4 at least as long as the distance between its base and the base on S5 and macroseta on basitarsus of leg IV knobbed. Furthermore, *T. (A.) persianus* has seta Z5 knobbed. *Typhlodromus (A.) wrenschae* Ueckermann & Loots also differs from this new species by having seta S2 0.4 times as long as the distance between its base and the base of S4; setae Z5, JV5 and StIV knobbed.

### ***Typhlodromus (Anthoseius) gardeniae* Schultz** (Fig. 20)

*Typhlodromus (Anthoseius) gardeniae* Schultz, 1973: 98; Moraes *et al.*, 2004: 325; Chant & McMurtry, 2007: 152.

*Amblydromella gardeniae*, Moraes *et al.*, 1986: 162.

*Amblydromella (Aphanoseia) gardeniae*, Denmark & Welbourn, 2002: 308.



**FIGURE 20.** *Typhlodromus (Anthoseius) gardeniae* Schultz (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

FEMALE. (Specimens measured—South Africa: holotype). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 302 long and 150 wide; mostly smooth, with anterolateral reticulations and faint median reticulations between setae z5 and Z4. With 5 pairs of solenostomes, gd8 not indicated in fig 20A. Setae j1 16, j3 19, j4 14, j5 16, j6 18, J2 21, J5 7, z2 14, z3 16, z4 18, z5 15, Z4 24, Z5 42, s4 19, s6 21, S2 24, S4 25, S5 20, r3 17, R1 17. Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin apparently convex; distances between ST1-ST3 55, ST2-ST2 48. Genital shield smooth; distance between ST5-ST5 53. Ventrianal shield smooth, pentagonal, with anterior margin straight, 104 long, 75 wide at level of ZV2, 72 wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shield. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 21 long, position renders teeth counting impossible; fixed digit 22 long, with 3-5 teeth.

Spermatheca. Calyx tubular, flaring gradually toward vesicle, 21 long.

Legs. Macroseta knobbed; St IV 20. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female, Limpopo Province, Blouberg, on *Gardenia* sp., 11-II-1966, L. Erasmus.

**Remarks.** The paratype female described with the holotype is not *T. (A.) gardeniae* but a *Paraseiulus* sp.

**World distribution.** South Africa.

### ***Typhlodromus (Anthoseius) ghanaensis* Zannou, Moraes & Oliveira, n. sp.**

(Fig. 21)

**Diagnosis.** Characterized by having dorsal shield mostly smooth, with lateral and sparse dorsocentral striae; dorsal setae smooth and knobbed, except Z4 and Z5, serrate, and j1, j4-j6, J5 and z5 sharp-tipped; ventrianal shield mostly smooth, with some reticulations around anus; setae JV5 smooth and knobbed; calyx of spermatheca tubular.

FEMALE. (1 specimen measured). Idiosomal setal pattern: 12A:8A/JV: ZV.

Dorsum. Dorsal shield, 272 long and 150 wide; mostly smooth, with lateral and sparse dorsocentral striae. With 5 pairs of solenostomes. Setae j1 13, j3 16, j4 16, j5 14, j6 19, J2 19, J5 10, z2 14, z3 16, z4 18, z5 16, Z4 26, Z5 38, s4 19, s6 19, S2 22, S4 22, S5 19, r3 16, R1 16. Setae j1, j4, j5, j6, Z4 and Z5 smooth and knobbed, except for Z4 and Z5, serrate; j1, j4-j6, J5 and z5, sharp-tipped.

Peritreme. Extending to level of j1.

Venter. Sternal shield too lightly sclerotized to be illustrated; distances between ST1-ST3 58, ST2-ST2 53. Genital shield smooth; distance between ST5-ST5 51. Ventrianal shield mostly smooth, with some reticulations around anus, pentagonal, with anterior margin slightly concave, 96 long, 80 wide at level of ZV2, 74 wide at level of anus, with 4 pairs of pre-anal setae (JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped except for JV5, knobbed.

Chelicera. Position renders measurement of digits and count of teeth impossible.

Spermatheca. Calyx tubular, 19 long; atrium small, incorporated in calyx.

Legs. Macrosetae knobbed; Sg IV 11; Sti IV 13, St IV 21. Tibia IV with 2 knobbed setae in addition to the macroseta. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female from unknown plant, Cape Coast, Ghana, 12-XI-1989, J.S. Yaninek, deposited at ESALQ-USP.

**Etymology.** The name *ghanaensis* refers to the country where the holotype of this species was found (Ghana).

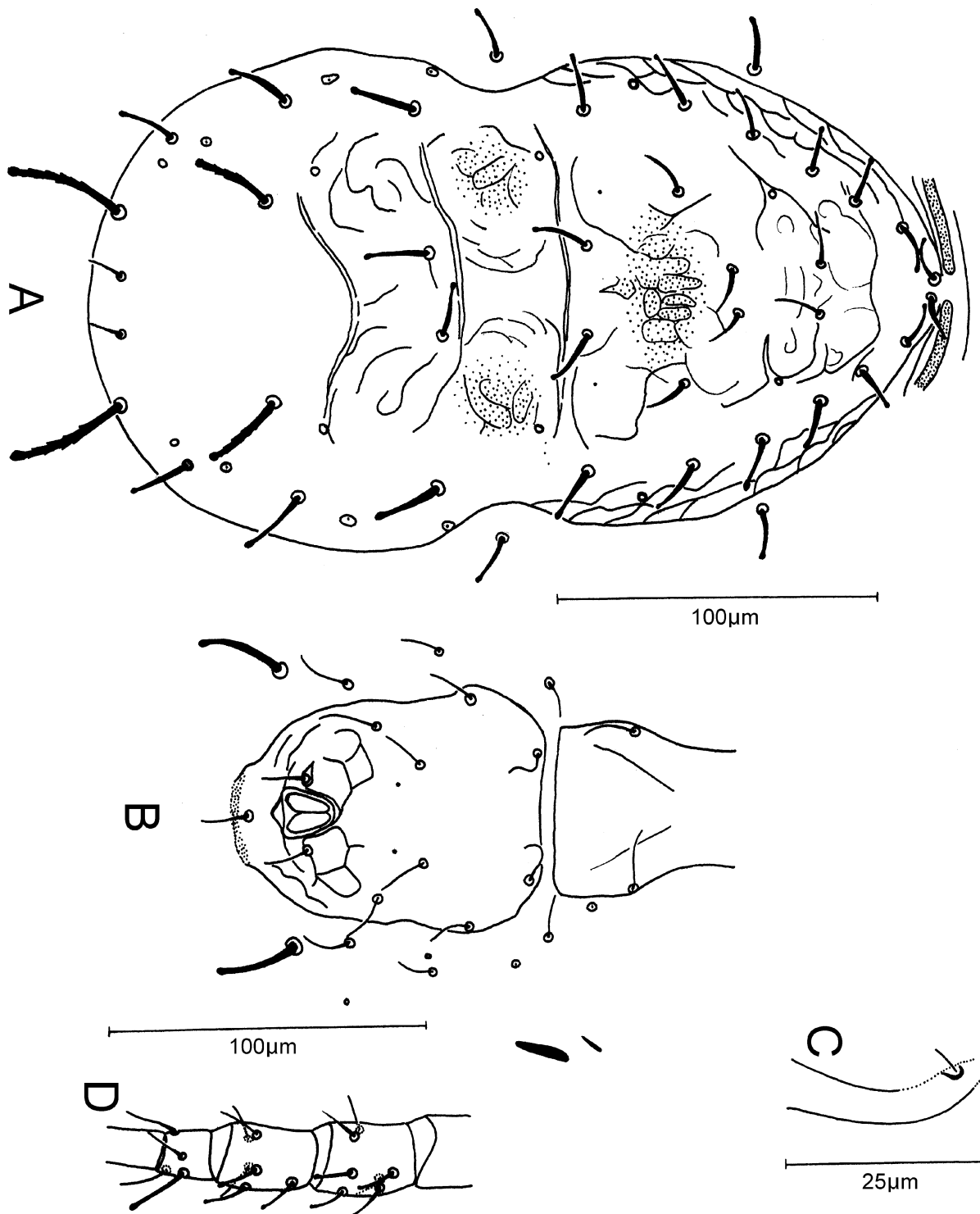
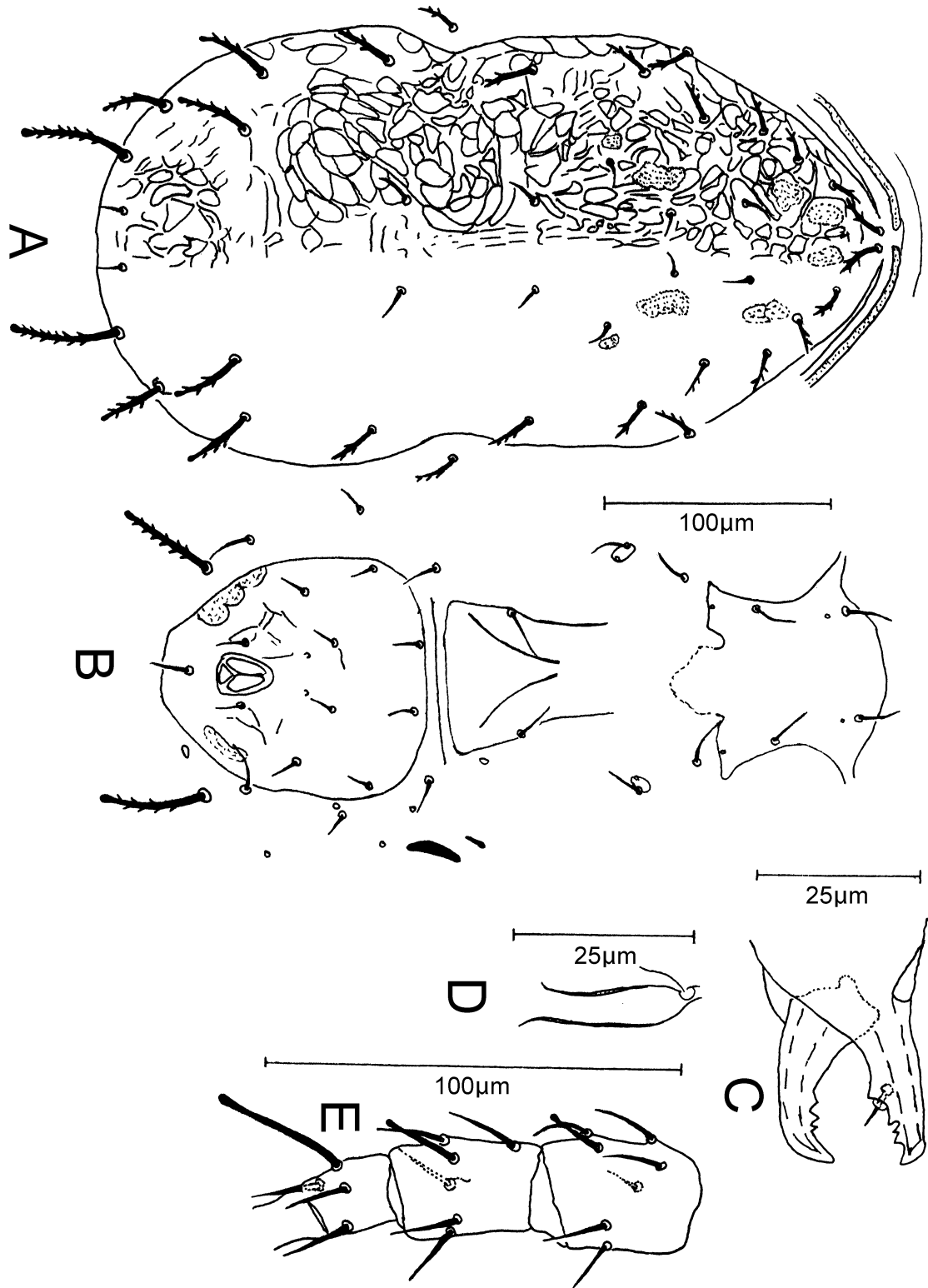


FIGURE 21. *Typhlodromus (Anthoseius) ghanaensis* Zannou, Moraes & Oliveira, n. sp. (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

**Remarks.** *Typhlodromus (A.) cephalochaitosus* differs from this species by having all the dorsal setae knobbed, except j1 and J5, sharp-tipped, and by lacking z3. *Typhlodromus (A.) hartlandrowei* Evans and *Typhlodromus (A.) transvaalensis* (Nesbitt) differ from the new species by having most of dorsal setae serrate and much longer as well as by lacking seta JV3.



**FIGURE 22.** *Typhlodromus (Anthoseius) grastis* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

***Typhlodromus (Anthoseius) grastis* Ueckermann & Loots**

(Fig. 22)

*Typhlodromus (Anthoseius) grastis* Ueckermann & Loots, 1988: 21; Moraes *et al.*, 2004: 326; Chant & McMurtry, 2007: 152.

*Amblydromella (Aphanoseia) grastis*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 6 paratypes and 1 additional specimen). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 353 (343–364) [353] long and 183 (173–206) [181] wide; strongly reticulate. With 5 pairs of solenostomes, not indicated in fig 22A. Setae j1 21 (20–23) [21], j3 17 (16–19) [17], j4 12 (11–13) [13], j5 11 (11–12) [11], j6 13 (11–15) [15], J2 15 (14–18) [14], J5 10 (9–11) [11], z2 14 (12–16) [15], z3 16 (14–17) [17], z4 17 (15–19) [18], z5 12 (11–15) [13], Z4 28 (26–31) [31], Z5 46 (43–48) [47], s4 19 (16–22) [19], s6 22 (19–24) [23], S2 24 (22–26) [26], S4 29 (26–31) [31], S5 25 (26–31) [30], r3 18 (15–19) [19], R1 18 (17–19) [19]. Setae serrate and sharp-tipped, except j4–J5 and z5, smooth; and Z4, Z5, S4 and S5, knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin with a wedge-shaped median projection; distances between ST1–ST3 66 (59–69) [69], ST2–ST2 55 (53–58) [53]. Genital shield smooth; distance between ST5–ST5 53 (50–59) [52]. Ventrianal shield with few striations around anus, broadly oval, with anterior margin almost straight, 120 (115–125) [122] long, 107 (99–119) [109] wide at level of ZV2, 93 (87–96) [92] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate and knobbed.

Chelicera. Movable digit 30 (27–31) [30] long, with 3 teeth; fixed digit 29 (28–31) [28] long, with 4 teeth.

Spermatheca. Calyx a broad tube, 20 (16–22) [21] long.

Legs. Macrosetae knobbed; Sge IV 16 (15–17) [15], Sti IV 21 (19–22) [21], St IV 32 (30–35) [34]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. Paratype male damaged, unsuitable for description.

**Specimens examined. South Africa:** Holotype female and 4 paratype females, North-West Province, Rustenburg Nature Reserve, on grass, 11-XII-1979, E.A. Ueckermann; 1 paratype female, Mpumalanga Province, Marble Hall, on *Eragrostis superba*, 8-IV-1975, M.K.P. Smith Meyer; 1 female, Gauteng Province, Roodeplaat near Pretoria, on grass, 15-I-1980, A.S. Dippenaar-Schoeman. **Zimbabwe:** 1 paratype female, Hartley, on *Rotboellia mosambicensis*, 21-III-1969, M.K.P. Smith Meyer.

**World distribution.** South Africa and Zimbabwe.

***Typhlodromus (Anthoseius) grewiae* Zannou, Moraes & Oliveira, n. sp.**

(Fig. 23)

**Diagnosis.** This species is characterized by having dorsal shield reticulate; dorsal shield setae lanceolate, strongly serrate and inserted on small tubercles, except J5, smooth, setiform and sharp-tipped; ventrianal shield smooth, subtriangular, with 3 pairs of pre-anal setae (JV3 absent); caudoventral seta JV5 lanceolate and serrate; calyx of spermatheca saccular; a single and knobbed macroseta, on tarsus of leg IV.

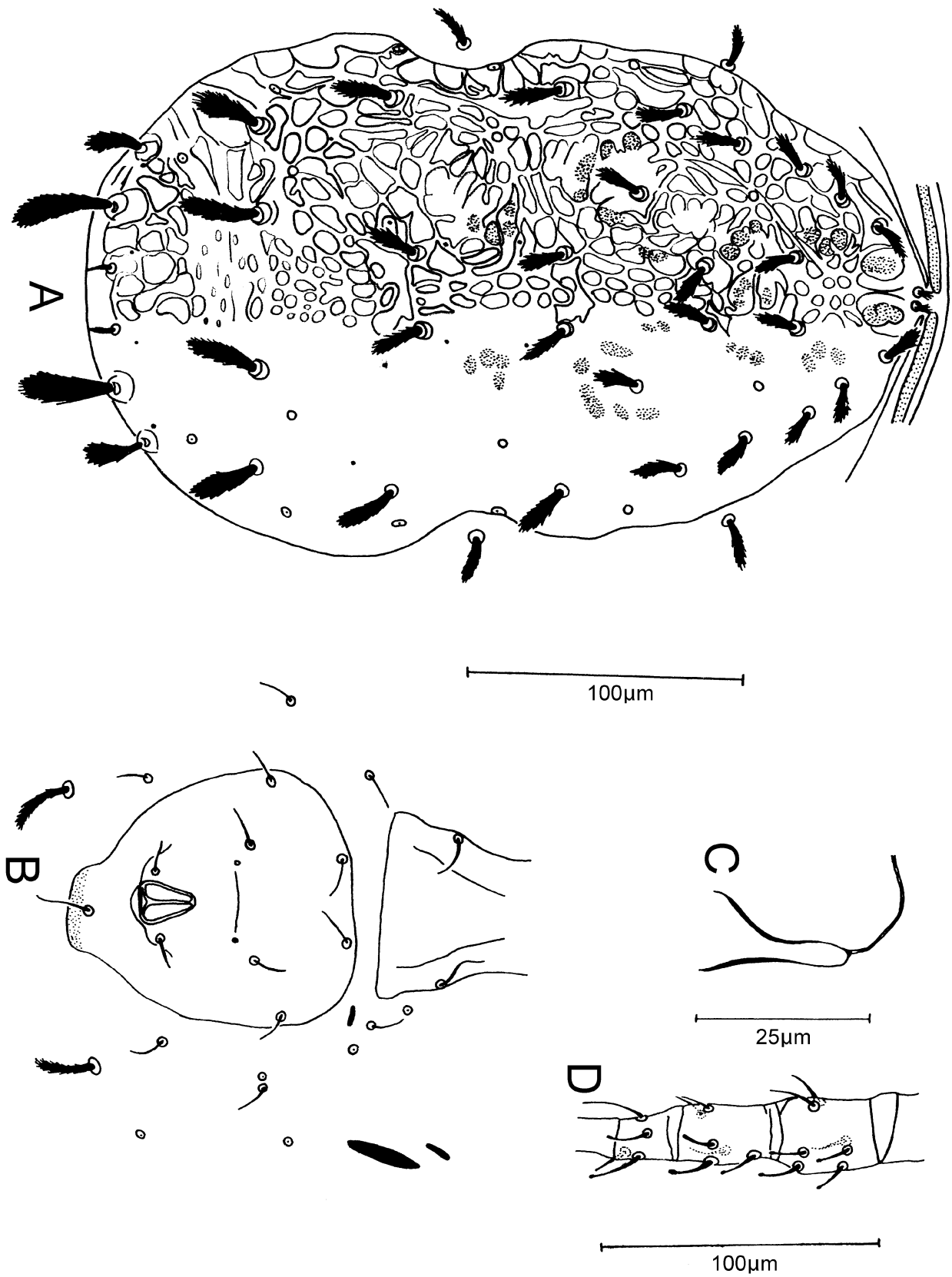
FEMALE. (1 specimen measured). Idiosomal setal pattern: 12A:8A/JV-3:ZV.

Dorsum. Dorsal shield, 298 long and 179 wide, rugose. With 5 pairs of solenostomes. Setae j1 (not in a good position to be measured), j3 16, j4 16, j5 16, j6 19, J2 22, J5 10, z2 14, z3 14, z4 18, z5 18, Z4 29, Z5 35, s4 19, s6 22, S2 24, S4 27, S5 22, r3 16, R1 16. Setae lanceolate, strongly serrate and inserted on small tuber-



cles, except J5, smooth, setiform and sharp-tipped.

Peritreme. Extending to level of j1.



**FIGURE 23.** *Typhlodromus (Anthoseius) grewiae* Zannou, Moraes & Oliveira, n. sp. (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

Venter. Sternal shield too lightly sclerotized to be illustrated; distances between ST1-ST3 58, ST2-ST2 61. Genital shield smooth; distance between ST5-ST5 53. Ventrianal shield smooth, subtriangular, with anterior margin convex, 99 long, 90 wide at level of ZV2, with 3 pairs of pre-anal setae (JV3 absent); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth, setiform and sharp-tipped except JV5, lanceolate and serrate.

Chelicera. Movable digit 25 long, with 2 teeth; fixed digit 23 long, apparently with 3 – 4 teeth.

Spermatheca. Calyx saccular, slightly constrict before flaring towards vesicle, 14 long; atrium very small and nodular.

Legs. Macroseta knobbed: St IV 18 plus an additional knob seta. With the following numbers of knobbed setae, in addition to the macroseta on tarsus IV: tarsus IV one; genu IV 4; genu III, 4; tibia IV 3; tibia III, 3, tarsus III, 2; tibia IV, 2. Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female from *Grewia* sp., 25 km S. Malindi, Coastal Province, Kenya, 1-XII-1989, J.S. Yaninek, deposited at ESALQ-USP.

**Etymology.** The name *grewiae* refers to the genus of the plant on which the type of this species was collected.

**Remarks.** *Typhlodromus* (A.) *combretum*, *T. (A.) michaeli*, *T. (A.) coryphus* Wu, *T. (A.) machaon* (Wainstein) and *T. (A.) serratus* (Chaudhri) differ from this species by having 4 pairs of pre-anal setae (JV3 present). *Typhlodromus* (A.) *hartlandrowei* Evans and *T. (A.) transvaalensis* Nesbitt differ from the new species by having most of the dorsal setae longer than in the new species, knobbed and not lanceolate.

### ***Typhlodromus (Anthoseius) hartlandrowei* Evans**

(Fig. 24)

*Typhlodromus (Typhlodromus) hartlandrowei* Evans, 1958: 580.

*Clavidromus hartlandrowei*, Muma, 1961: 296.

*Typhlodromus (Neoseiulus) hartlandrowei*, Pritchard & Baker, 1962: 222.

*Typhlodromus (Anthoseius) hartlandrowei*, Moraes *et al.* 2004: 328; Chant & McMurtry, 2007: 155.

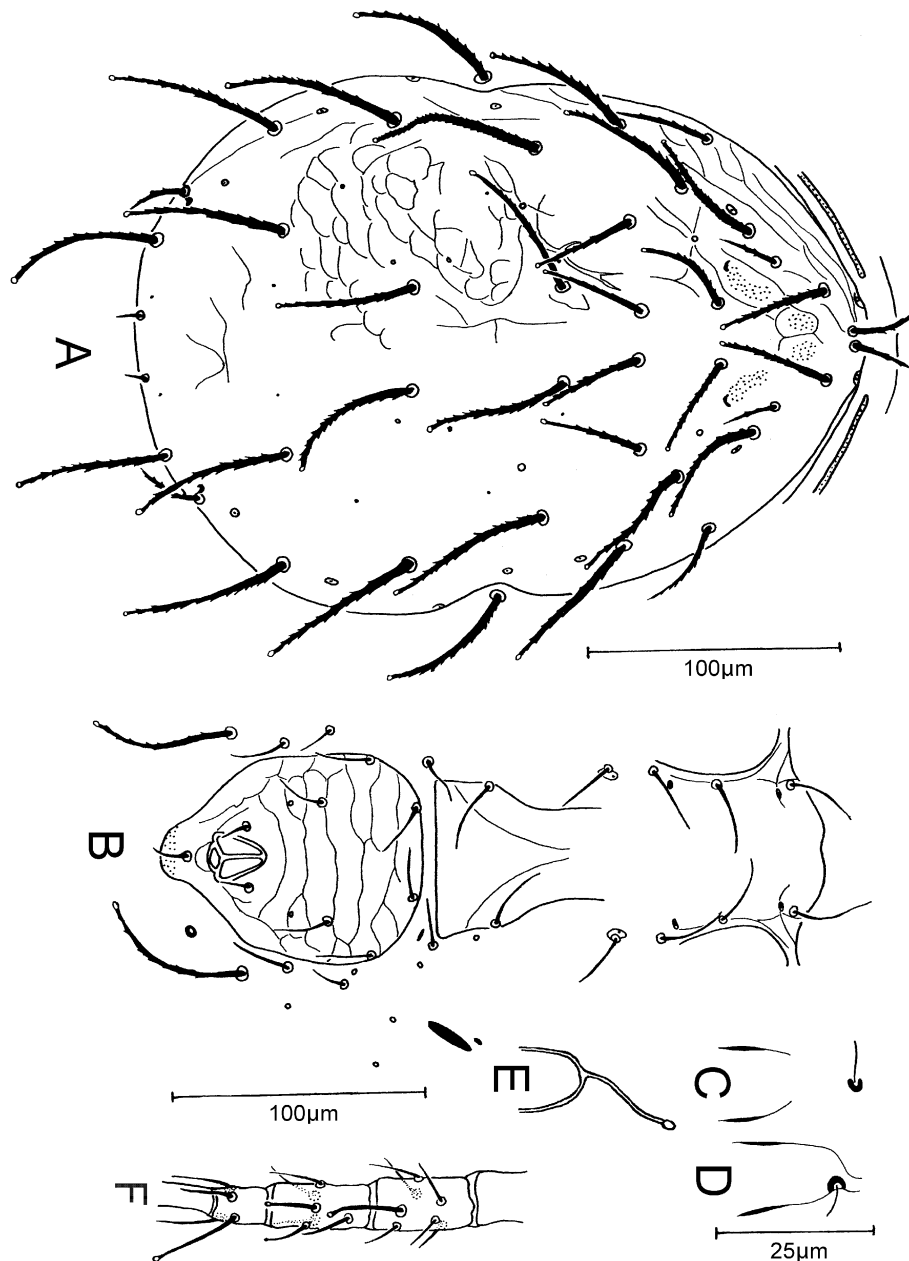
FEMALE. (Specimens measured—Democratic Republic of Congo: 1; Nigeria: 1; Uganda: 1 and holotype). Idiosomal setal pattern: 12A:8A/JV-3:ZV.

Dorsum. Dorsal shield 290 (285–295) [295] long and 206 (200–215) [190] wide, striate anterior to J5 and reticulate between j6 and Z4. Apparently also with 5 pairs of solenostomes. Setae j1 26 (25–27), j3 43 (40–45) [48], j4 40 (37–41) [44], j5 40 (36–44) [43], j6 55 (50–59) [57], J2 53 (50–55) [56], J5 10 [9], z2 24 (23–25) [23], z3 51 (50–51) [53], z4 56 (54–57) [58], z5 38 (35–40) [38], Z4 63 (62–64) [62], Z5 64 (63–66) [63], s4 61 (60–62) [63], s6 65 (65–66) [67], S2 69 (68–71) [71], S4 70 (70–71) [71], S5 22 (19–24) [17], r3 40 (38–43) [44], R1 59 (58–60) [60]. Setae serrate and knobbed, except for j1, z2, S5 and r3, sharp-tipped; and J5, smooth and sharp-tipped. Most setae longer than distances between their bases and bases of setae following next behind.

Peritreme. Extending to level between j1 and j3.

Venter. Sternal shield mostly smooth, with few lateral striae and 2 pairs of setae (ST3 on integument); posterior margin indistinct; distances between ST1–ST3 55 (52–57) [59], ST2–ST2 55 (54–56) [50]. Genital shield smooth; distance between ST5–ST5 55 (53–57) [55]. Ventrianal shield reticulate, subtriangular, with anterior margin convex, 102 (98–104) [97] long, 89 (84–96) [85] wide at level of ZV2, with 3 pairs of pre-anal setae (seta JV3 absent); round pre-anal pores posterior to and vertically aligned with JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate and knobbed.

Chelicera. Movable digit 27 long, with 1 tooth; fixed digit 24 long, with 2 teeth.



**FIGURE 24.** *Typhlodromus (Anthoseius) hartlandrowei* Evans (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca of the female collected from Nigeria in the present study; D. Spermatheca of female from Democratic Republic of Congo; E Spermatheca of a female collected from Nigeria, on *Musa* sp. and identified as *T. (A.) hartlandrowei* by Matthyse & Denmark (1981); F. Leg IV.

Spermatheca. Calyx variable in shape (see remarks), 14 (11–17) long; atrium small, sometime incorporated in calyx.

Legs. Macrosetae knobbed: Sge III 22 (21–22) [20], Sti III 18 (17–19) [19], Sge IV 32 (31–32) [32], Sti IV 22 (21–24) [23], St IV 40 (37–42) [43]. Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Specimens examined. Democratic Republic of Congo:** 1 female, 34 km E Matadi, Bas-Congo, on *Andropogon guyanus*, 11-VII-1991, A. Onzo. **Nigeria:** 1 female, 1 km S Odukpan, on *Elaeis guineensis*, 16-IV-1992, A. Onzo. **Uganda:** Holotype female was collected, near Kampala, in nest of social spider, 1957, G.O. Evans; one female, 25 km N Bundibugyo, on *E. guineensis*, 9-X-1990, J.S. Yaninek.

**Remarks.** The spermatheca was not illustrated or described in the original description of this species. One of the authors (GJM) examined the female collected from Ibadan, Nigeria, on *Musa* sp. by Matthyse & Den-

mark (1981) and reported as *Clavidromus hartlandrowei*, and illustrated its spermatheca (Fig. 24E); the calyx is distally bell-shaped on ca. 40% and distally slender on 60% of its length; the atrium is undifferentiated. The calyx of a specimen recently collected from Uganda is similar to that of the female reported from Nigeria by Matthyse & Denmark (1981). However, in the specimen from Nigeria, collected during the recent surveys, the proximal half of the calyx is bell-shaped and the distal half constricted (constricted portion not distinct) (Fig. 24C). The specimen from the Democratic Republic of Congo has the calyx of the spermatheca saccular (Fig. 24D). The latter 2 specimens have the atrium distinct and small.

**World distribution.** Democratic Republic of Congo, Nigeria and Uganda.

***Typhlodromus (Anthoseius) incisivus* Van der Merwe**  
(Fig. 25)

*Typhlodromus (Anthoseius) incisivus* Van der Merwe, 1968: 35; Moraes *et al.*, 2004: 330; Chant & McMurtry, 2007: 155.  
*Amblydromella incisiva*, Moraes *et al.*, 1986: 164.  
*Amblydromella (Aphanoseia) incisiva*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 3 paratype and 9 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 363 (347–372) [358] long and 211 (196–231) [212] wide; reticulate between j1 and Z4 and striate posteriorly to Z4. With 5 pairs of solenostomes, not all indicated in fig 25A. Setae j1 20 (19–22) [19], j3 19 (17–20) [18], j4 13 (12–15) [13], j5 13 (12–14) [13], j6 17 (15–19) [18], J2 19 (17–23) [19], J5 10 (8–11) [9], z2 16 (14–19) [15], z3 17 (15–19) [17], z4 19 (17–22) [19], z5 15 (12–16) [16], Z4 31 (26–37) [29], Z5 49 (44–52) [47], s4 22 (16–24) [21], s6 23 (19–27) [27], S2 25 (22–27) [24], S4 22 (19–25) [22], S5 20 (15–20) [21], r3 18 (15–20) [19], R1 18 (15–19) [18]. Setae smooth and sharp-tipped, except Z5, serrate and blunt.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a median lobe; distances between ST1–ST3 61 (58–65) [60], ST2–ST2 50 (46–53) [49]. Genital shield smooth; distance between ST5–ST5 60 (54–65) [59]. Ventrianal shield smooth, pentagonal, with anterior margin straight, 117 (112–126) [114] long, 80 (75–92) [80] wide at level of ZV2, 75 (66–81) [73] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 25 (24–26) [25] long, with 2 teeth; fixed digit 25 (20–28) [27] long, with 2 teeth.

Spermatheca. Calyx a broad tube, 17 (14–18) [17] long; atrium small.

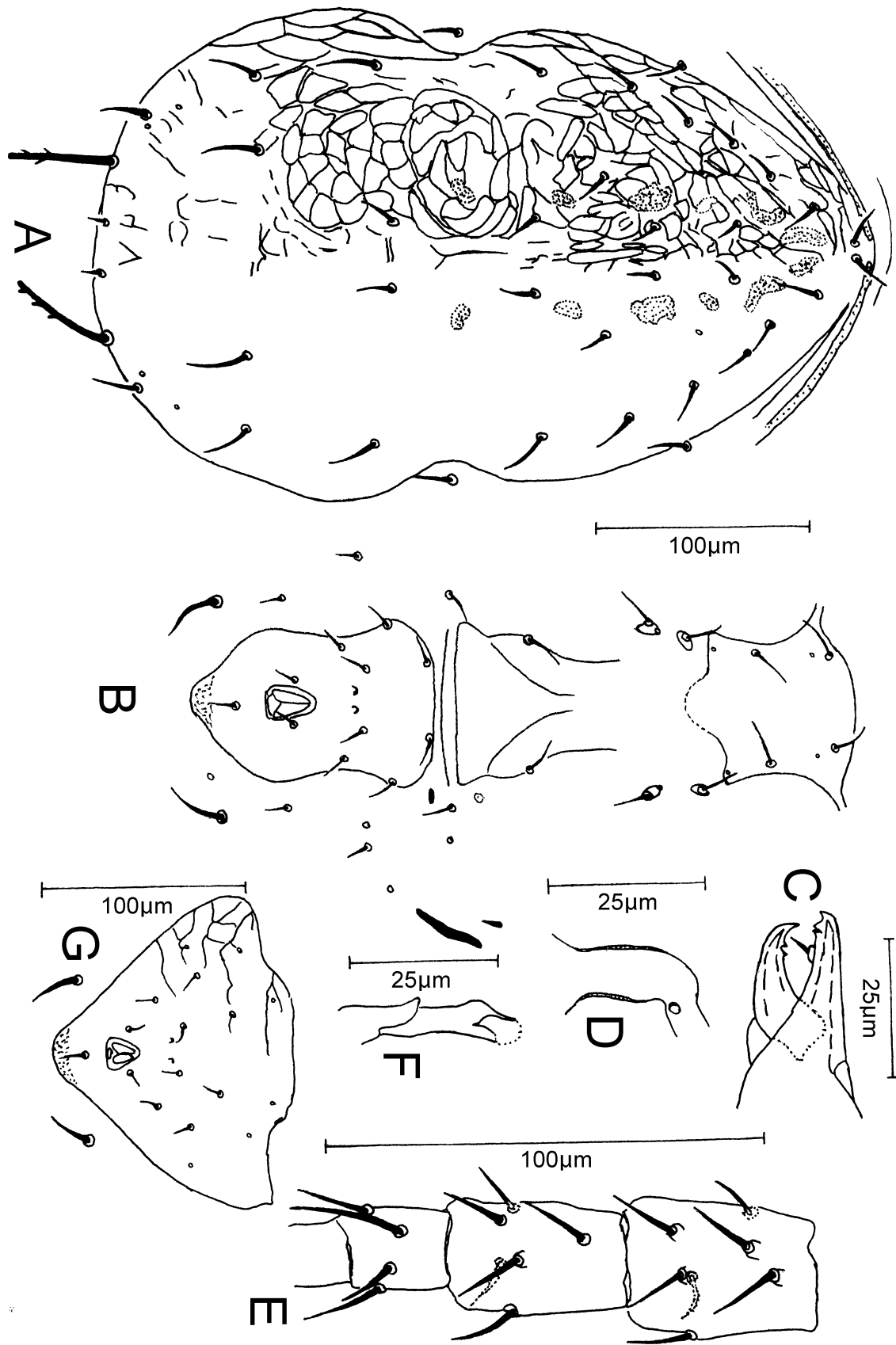
Legs. Macroseta sharp-tipped; St IV, 25 (22–28) [25]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 3)

Dorsum. Dorsal shield pattern and setae as in female, 271 (252–284) long and 176 (166–183) wide. Setae j1 15 (14–16), j3 15 (14–16), j4 11 (9–12), j5 10 (9–11), j6 14 (13–14), J2 13 (11–15), J5 9 (7–10), z2 13, z3 13 (11–14), z4 15 (13–16), z5 12 (11–12), Z4 24 (23–25), Z5 33 (31–34), s4 17 (16–18), s6 17 (17–18), S2 17, S4 16 (15–16), S5 13 (12–15), r3 14 (13–16), R1 14 (13–15).

Peritreme. Extending almost to level of j1.

Venter. Ventrianal shield subtriangular, mostly smooth, with lateral reticulation and sparse median striae anteriorly to JV3, free from peritrematal shields, 114 (110–116) long, 142 (138–148) wide at anterior corners; with 4 pairs of pre-anal setae and 3 pairs of lyrifissures (1 anterior to JV1, 1 sublateral and anterior to JV1 and 1 lateral and almost transversally aligned with ZV2); elliptical pre-anal pores posteromesad of JV2.



**FIGURE 25.** *Typhlodromus (Anthoseius) incisivus* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

Spermatodactyl. Straight, shaft 23 (21–26) long.

Legs. Macroseta sharp-tipped; St IV 24.21 (16–25). Chaetotaxy of genera II and III as in female.

**Specimens examined. South Africa:** Holotype female and 2 paratype females, Eastern Cape Province, Mountain Zebra National Park, on *Dodonaea viscosa*, 28-I-1965, M.K.P. Smith Meyer; 1 paratype female, Eastern Cape Province, Soutkloof, Addo, on *Atriplex vestita*, 2-II-1965, M.K.P. Smith Meyer; 1 female from Eastern Cape Province, 34 km from Willomore to Uniondale, on a plant of the family Mesembryanthemaceae, 25-IX-1988, J.C.S. Barnard; 1 female and 1 male, Free State Province, 10 km from Bethulie to Venterstad, on, *Lightfootia albens*, 3-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Langkloof River between Aliwal North and Burgersdorp, on *Melolobium canescens*, 12-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Mountain Zebra National Park, on *Pegolettia retrofracta*, 6-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Mountain Zebra National Park, on *Trachonanthus camphoratus*, 6-III-1986, E.A. Ueckermann; 1 female, Eastern Cape Province, Mountain Zebra National Park, on *Walafriida saxatilis*, 6-III-1986, M.K.P. Smith Meyer; 1 female and 1 male, Northern Cape Province, 10 km from Colesberg to Norvalspont, on *Pentzia globosa*, 4-III-1986, M.K.P. Smith Meyer; 1 female, Free State Province, 4 km from Bethulie to Burgersdorp, on *Chrysocoma tenuifolia*, 3-III-1986, M.K.P. Smith Meyer; 1 male, Eastern Cape Province, Mountain Zebra National Park, on *Diospyros austroafricana*, 5-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Mountain Zebra National Park, on *Lotononis divaricata*, 4-III-1986, E.A. Ueckermann.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) johannae* Ueckermann & Loots

(Fig. 26)

*Typhlodromus (Anthoseius) johannae* Ueckermann & Loots, 1988: 24; Moraes *et al.*, 2004: 332; Chant & McMurtry, 2007: 155.

*Amblydromella (Aphanoseia) johannae*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 4 paratypes and 1 additional specimen). Idiosomal setal pattern 12A:8A/JV:ZV.

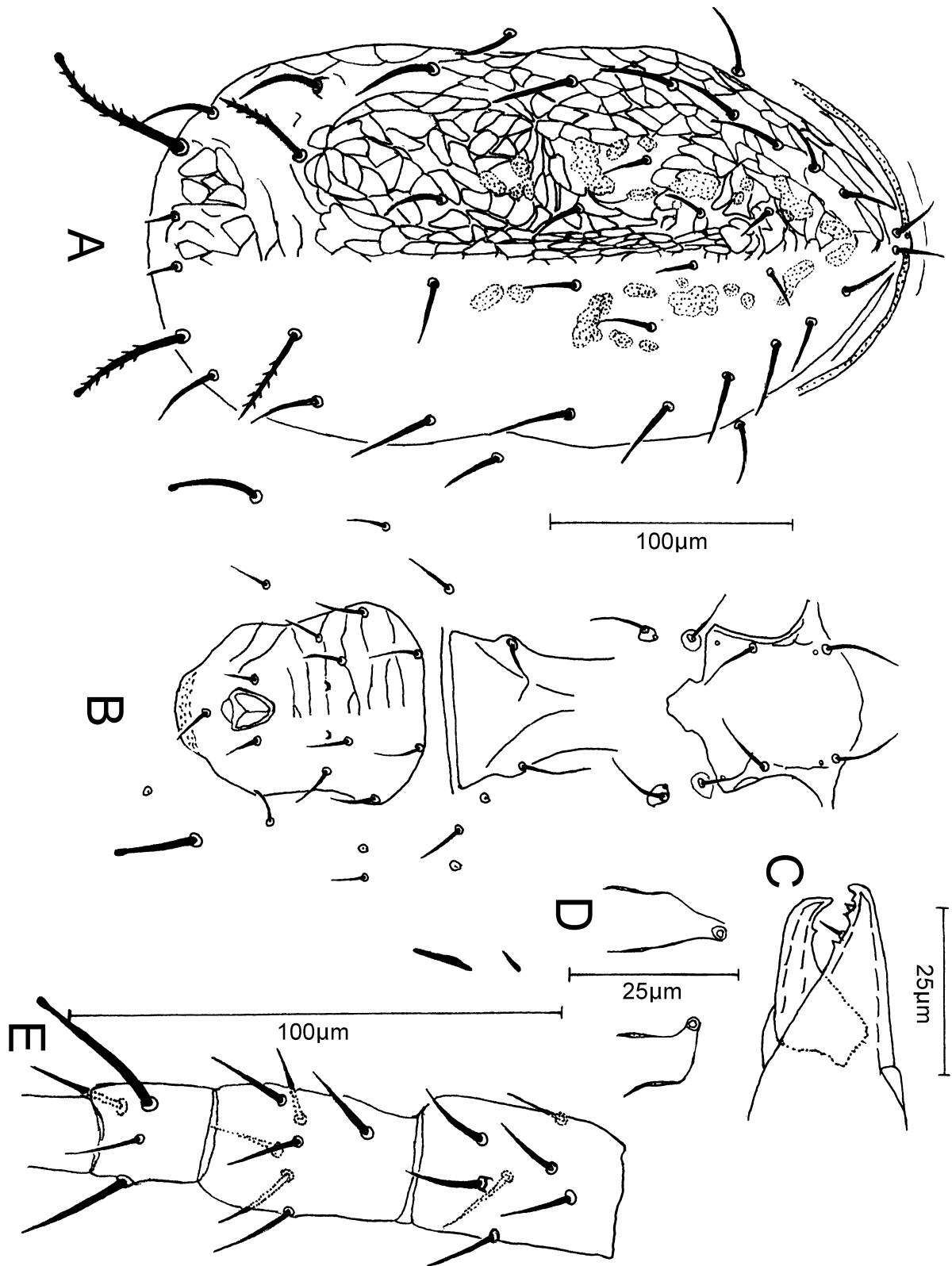
Dorsum. Dorsal shield 311 (300–325) [316] long and 172 (164–184) [171] wide, strongly reticulate. With 5 pairs of solenostomes, not indicated in fig 26A. Setae j1 22 (20–23) [23], j3 27 (22–29) [26], j4 17 (15–17) [17], j5 17 (16–20) [19], j6 23 (19–24) [24], J2 28 (21–33) [30], J5 12 (10–13) [13], z2 22 (19–23) [23], z3 29 (23–32) [32], z4 30 (23–34) [30], z5 21 (18–23) [22], Z4 41 (36–45) [42], Z5 61 (55–65) [63], s4 31 (26–35) [32], s6 33 (28–35) [35], S2 35 (31–37) [35], S4 30 (28–32) [32], S5 28 (23–32) [32], r3 30 (27–31) [30], R1 25 (21–28) [26]. Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a wedge-shaped median lobe; distances between ST1–ST3 55 (51–58) [54], ST2–ST2 48 (46–50) [48]. Genital shield smooth; distance between ST5–ST5 49 (45–53) [50]. Ventrianal shield reticulate, pentagonal, with anterior margin slightly convex, 105 (99–109) [105] long, 82 (77–91) [86] wide at level of ZV2, 71 (65–74) [74] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 26 (25–27) [25] long, with 1 tooth; fixed digit 26 (25–27) [25] long, with 4 teeth.

Spermatheca. Calyx cup-shaped near vesicle, short and broad, immediately narrows adjacent to atrium, 14 (10–20) [12] long.



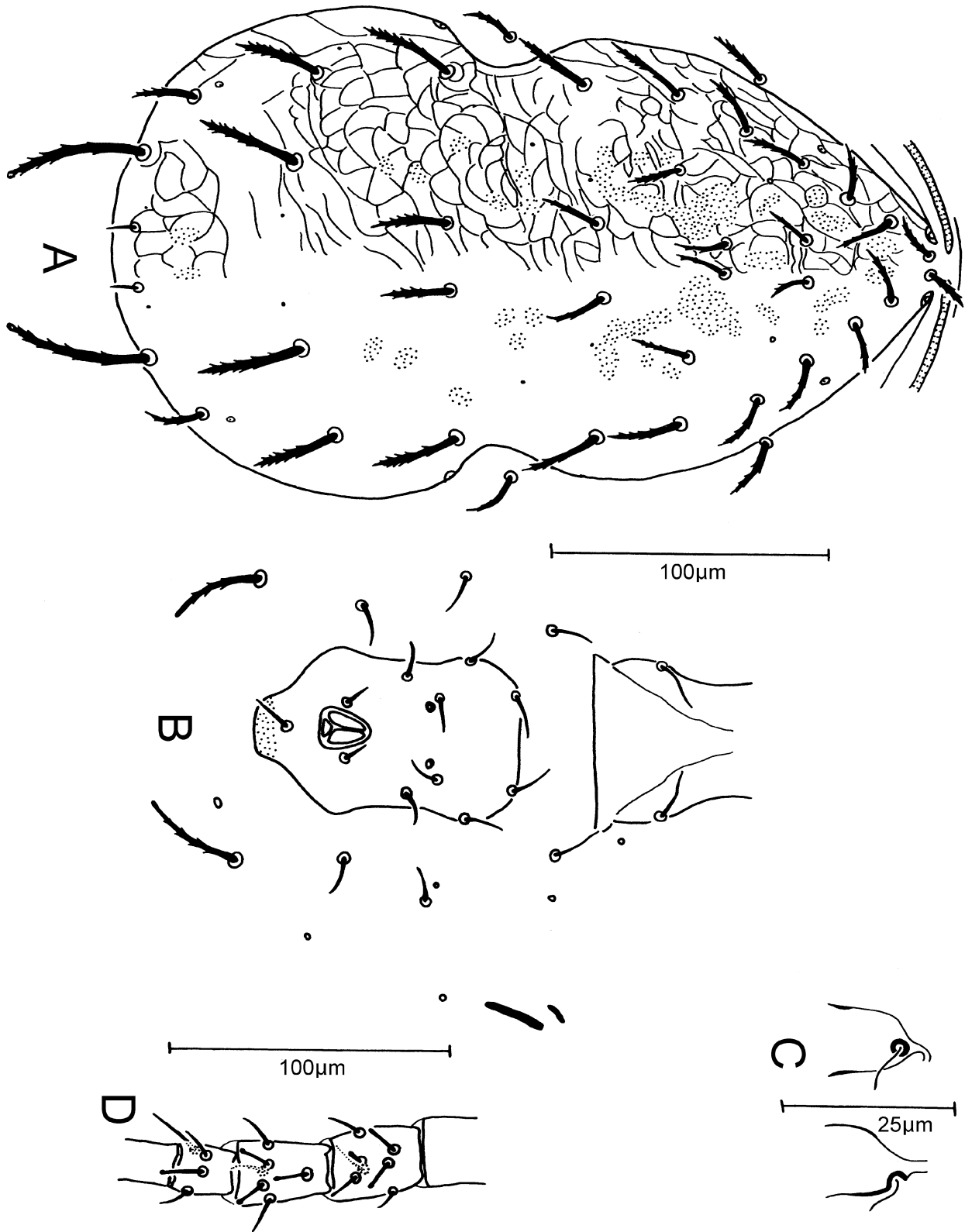
**FIGURE 26.** *Typhlodromus (Anthoseius) johannae* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

Legs. Macroseta knobbed; St IV 30 (28–35) [30]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1. Tibia IV with 6 or 7 setae.

**Specimens examined. South Africa:** Holotype female and 4 paratype females, Mpumalanga Province,

Blyde River Canyon Nature Reserve, on *Hemizygia transvaalensis*, 23-II-1978, E.A. Ueckermann; 1 female, Kwazulu/Natal Province, Loteni Nature Reserve, on *Diospyros* sp., 17-I-1991, E.A. Ueckermann.

**World distribution.** South Africa.



**FIGURE 27.** *Typhlodromus (Anthoseius) kenyaе* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.



***Typhlodromus (Anthoseius) kenyae* Zannou, Moraes & Oliveira, n. sp.**

(Fig. 27)

**Diagnosis.** This species is characterized by having all dorsal setae serrate, except J5, smooth; Seta z2 closer to j3 than to z3; ventrianal shield pentagonal; seta JV5 serrate and knobbed; calyx of spermatheca bell-shaped; atrium small, incorporated in calyx.

FEMALE. (2 specimens measured). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield, 282 (277–288) long and 156 (152–160) wide, reticulate. Apparently with 5 pairs of solenostomes. Setae j1 17 (14–19), j3 22 (21–24), j4 17 (16–18), j5 18, j6 23 (22–24), J2 26 (24–27), J5 9 (8–10), z2 19, z3 24, z4 25 (24–26), z5 20 (19–21), Z4 34 (32–37), Z5 50 (46–53), s4 26 (26–27), s6 27 (26–29), S2 32 (30–34), S4 30 (27–32), S5 20 (18–22), r3 23 (21–26), R1 22 (21–24). Setae serrate and sharp-tipped, except J5, smooth; and Z5, knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield too weakly sclerotized to be illustrated and described; distances between ST1–ST3 53, ST2–ST2 51. Genital shield smooth; distance between ST5–ST5 50 (48–51). Ventrianal shield smooth, pentagonal, with anterior margin straight, 94 long, 67 (59–75) wide at level of ZV2, 60 (56–64) wide at level of anus, with 4 pairs of pre-anal setae (JV3 present); elliptical pre-anal pores slightly posterior and mesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth; except JV5, serrate and knobbed.

Chelicera. Movable digit 24 long, with 2 teeth; fixed digit 22 long, apparently with 3 to 4 teeth.

Spermatheca. Calyx bell-shaped, 13 (11–14) long, 10 in diameter; atrium small, incorporated in calyx.

Legs. Macroseta knobbed: Sge IV 6, Sti IV 13, St IV 16. Leg IV with 4 and 3 knobbed setae on genu and tibia. Chaetotaxy: genu II: 2-2/1, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype and 2 paratype females from *Acacia brevispica*, 25 km S. Malindi, Coastal Province, Kenya, 1-XII-1989, J.S. Yaninek, deposited at ESALQ-USP; 2 paratype females from *Mangifera indica*, 5 km N. Mtwapa, Coastal Province, Kenya, 30-XI-1989, J.S. Yaninek, deposited at IITAIM.

**Etymology.** The name *kenyae* refers to the country where the types of this species were collected.

**Remarks.** *Typhlodromus (A.) combretum*, *T. (A.) michaeli*, *T. (A.) coryphus* and *T. (A.) machaon* differ from this new species by having ventrianal shield subquadrangle, with lateral margins straight and at most 1.2 times as long as wide instead of pentagonal and at least 1.4 times as long as wide in the new species. Furthermore, *T. (A.) combretum*, *T. (A.) coryphus*, *T. (A.) machaon* have seta JV5 sharp-tipped, *T. (A.) michaeli* has relatively longer dorsal setae and z2 inserted mid-way between z3 and j3, and *T. (A.) machaon* has calyx a long tube flaring towards vesicle.

***Typhlodromus (Anthoseius) kikuyuensis* Swirski & Ragusa**

(Fig. 28)

*Typhlodromus kikuyuensis* Swirski & Ragusa, 1978: 406.

*Amblydromella kikuyuensis*, Moraes *et al.*, 1986: 166.

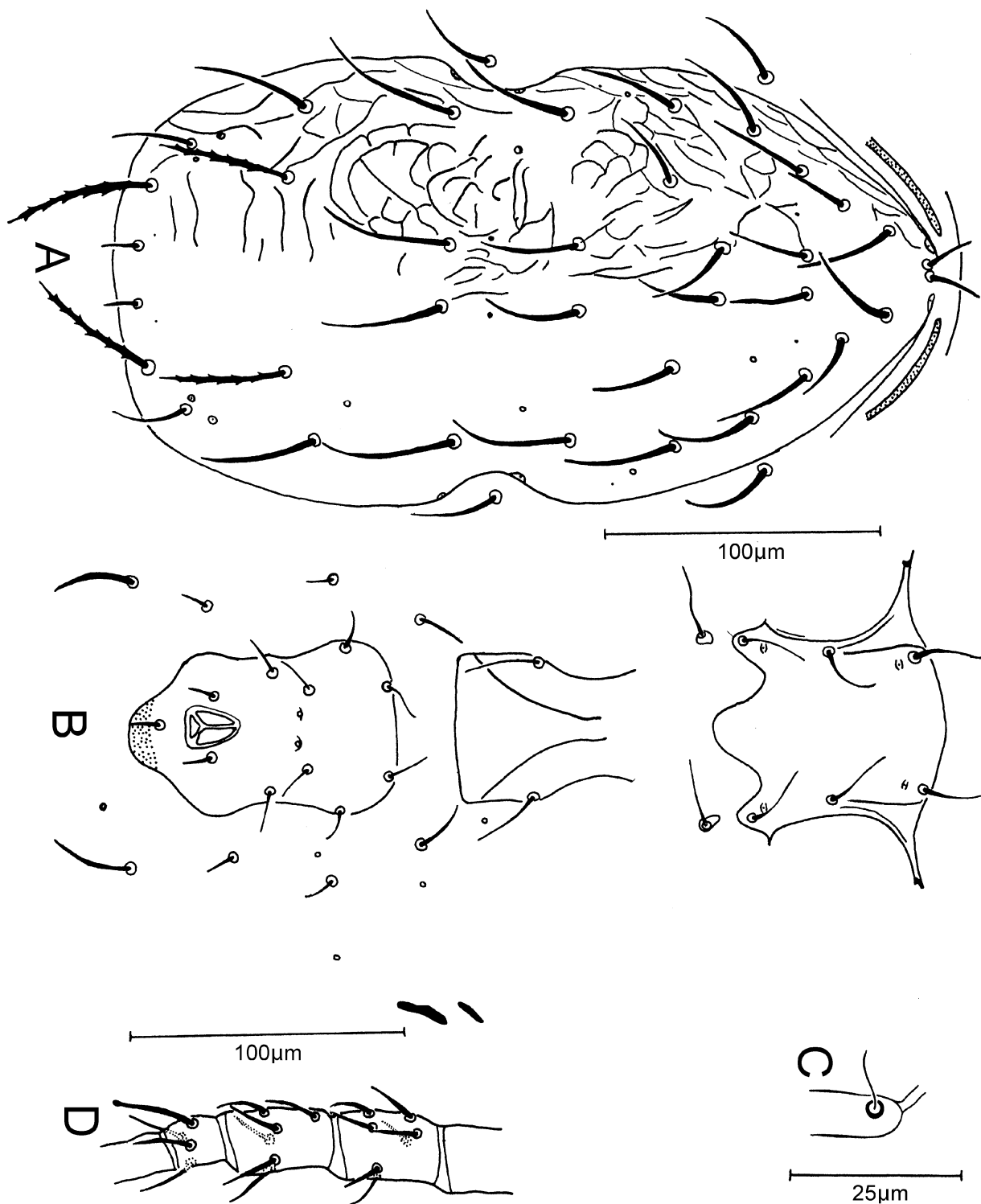
*Amblydromella (Amblydromella) kikuyuensis*, Denmark & Welbourn, 2002: 307.

*Typhlodromus (Anthoseius) kikuyuensis*, Moraes *et al.*, 2004: 334; Chant & McMurtry, 2007: 155.

FEMALE. (Specimen measured—Burundi: 2; Kenya: 2; Rwanda: 4; Uganda: 1). Idiosomal setal pattern: 12A:8A/JV: ZV.

Dorsum. Dorsal shield 293 (264–312) long and 165 (144–192) wide, faintly reticulate. With 5 pairs of solenostomes. Setae j1 19 (14–24), j3 25 (22–29), j4 20 (18–24), j5 21 (16–24), j6 29 (24–34), J2 35 (29–40), J5 10 (8–11), z2 19 (16–26), z3 27 (24–30), z4 29 (26–32), z5 24 (21–27), Z4 43 (35–48), Z5 52 (42–59), s4

31 (27–34), s6 36 (32–40), S2 41 (35–45), S4 34 (27–38), S5 25 (19–35), r3 26 (22–29), R1 25 (21–30). Setae smooth, except Z4 and Z5, serrate.



**FIGURE 28.** *Typhlodromus (Anthoseius) kikuyuensis* Swirski & Ragusa (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a median lobe; distances between ST1–ST3 60 (58–61), ST2–ST2 53 (50–58). Genital shield smooth; distance between ST5–ST5 51

(45–56). Ventrianal shield smooth, with anterior margin slightly convex, 97 (80–120) long, 66 (50–82) wide at level of ZV2, 59 (48–72) wide at level of anus, with 4 pairs of pre-anal setae (JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 23 (23–24) long, with 3 teeth; fixed digit 23 long, apparently with 5–7 teeth.

Spermatheca. Calyx bell-shaped, 12 (10–14) long; atrium small, incorporated in calyx.

Legs. Macroseta knobbed: St IV 36 (26–48). Chaetotaxy: genu II: 2-2/1, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Specimens examined. Burundi:** 1 female, Bujumbura, on unknown plant, 11-XII-1989, J.S. Yaninek; 1 female, Rumonge, Prefecture de Bururi, on *Citrus* sp., 14-XII-1989, J.S. Yaninek. **Kenya:** 1 female, Kisumu, Nyanza Province, on unknown plant, 3-XII-1989, J.S. Yaninek; 2 females, Katumani, on *Solanum incanum*, 30-IX-1990, J.S. Yaninek. **Rwanda:** 3 females, ISAR Station, Rubena, on *Commelina benghalensis*, 6-XII-1989, J.S. Yaninek; 4 females, Ruhengeri, on *Lantana camara*, 8-XII-1989, J.S. Yaninek; 3 females, Ruhengeri, on unknown plant, 8-XII-1989, J.S. Yaninek. **Uganda:** 1 female, 16 km E Busheni Kakunyo, on *Citrus* sp., 7-X-1990, B. Odoungo.

**Remarks.** Lengths of dorsal setae of specimens examined in this study vary within and between countries. The specimens from Burundi and Kenya have shorter dorsal setae than the ones from Rwanda and Uganda.

**World distribution.** Burundi, Kenya, Rwanda and Uganda.

### *Typhlodromus (Anthoseius) lobatus* Zannou, Moraes & Oliveira, n. sp.

(Fig. 29)

**Diagnosis.** Characterized by having dorsal shield mostly smooth, with anterolateral and sparse dorsocentral striae, roundish and elongate elements; dorsal setae smooth and sharp-tipped, except Z4, serrate and often knobbed, and Z5, serrate and always knobbed; sternal shield with 3 pairs of setae and a wedge-shaped median projection on posterior margin; ventrianal shield mostly smooth, with scarce transverse striae between setae JV2 and pre-anal pores; seta JV5 lightly serrate and knobbed; calyx of spermatheca funnel-shaped, atrium undifferentiated; with a single macroseta, on tarsus of leg IV.

FEMALE. (7 specimens measured). Idiosomal setal pattern: 12A:8A/JV: ZV.

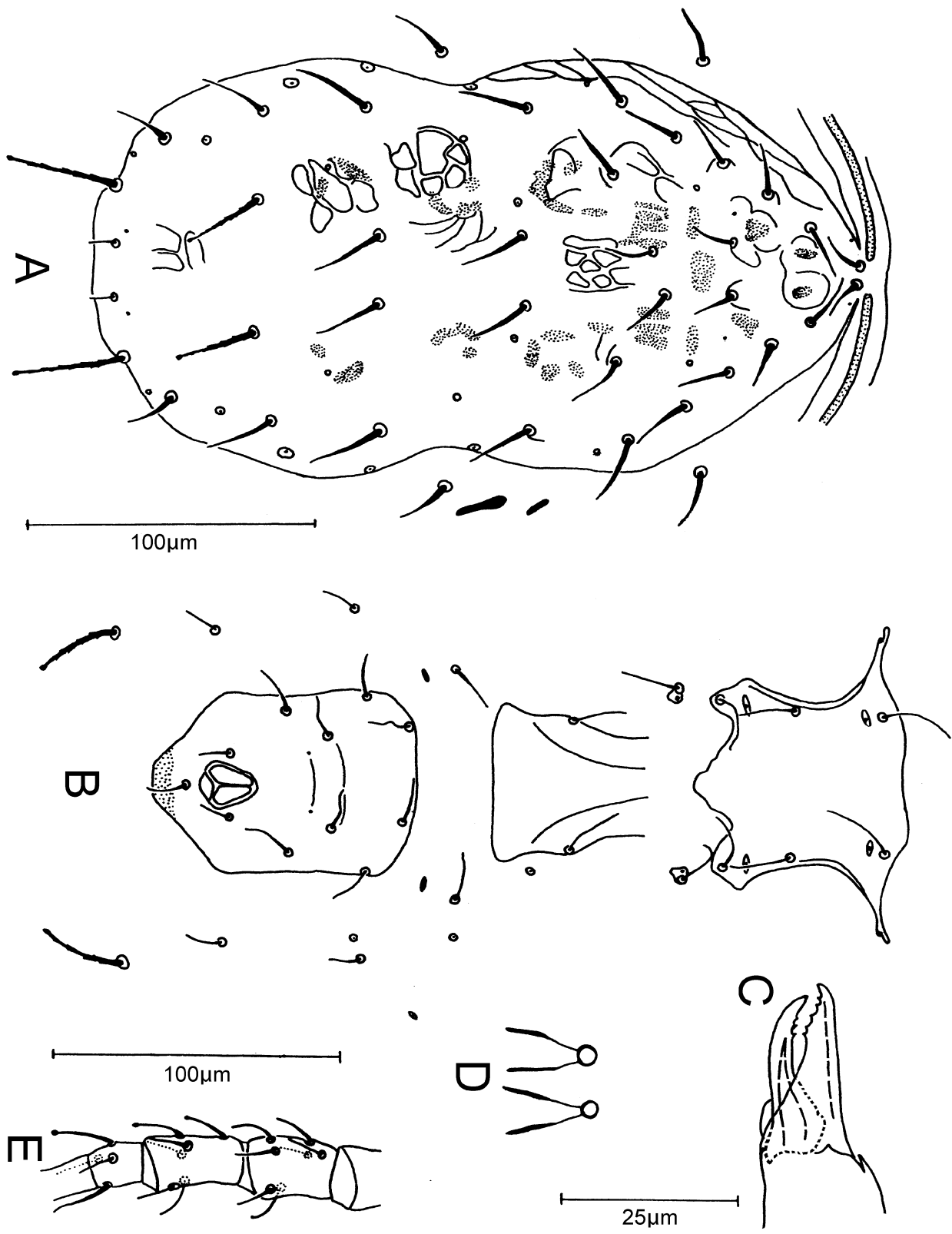
Dorsum. Dorsal shield, 264 (256–283) long and 142 (134–158) wide; striate anterolaterally and lightly reticulate dorsocentrally. With 5 pairs of solenostomes. Setae j1 14 (13–16), j3 18 (16–22), j4 16 (16–18), j5 17 (16–18), j6 24 (22–24), J2 26 (26–27), J5 9 (8–10), z2 17 (16–19), z3 21, z4 21 (21–22), z5 20 (18–22), Z4 30 (27–34), Z5 40 (34–48), s4 24 (19–27), s6 26 (24–27), S2 29 (26–34), S4 26 (24–34), S5 19 (16–21), r3 21 (19–22), R1 21 (19–24). Setae smooth and sharp-tipped; except Z4, serrate and often knobbed; and Z5, serrate and always knobbed. The specimens from Cameroon and one specimen from Kenya have seta Z4 sharp-tipped.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a median lobe; distances between ST1–ST3 55 (53–56), ST2–ST2 49 (48–50). Genital shield smooth; distance between ST5–ST5 48 (43–58). Ventrianal shield smooth, subquadrate, with anterior margin slightly convex, 86 (82–96) long, 62 (58–67) wide at level of ZV2, 59 (58–61) wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores, posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped; except for JV5, serrate and knobbed.

Chelicera. Movable digit 22 (21–22) long, with 3 teeth; fixed digit 21 (20–21) long, with 5 teeth.

Spermatheca. Calyx funnel-shaped, 10 (6–14) long; atrium undifferentiated.



**FIGURE 29.** *Typhlodromus (Anthoseius) lobatus* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

Legs. Macroseta knobbed: St IV 23 (21–27). Tibia of leg IV with 2 knobbed setae. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female from *Tridax procumbens*, Somanya, Ghana, 13-XI-1989,

G.J. Moraes, deposited at ESALQ-USP; 1 paratype female from unknown plant, 25 km S Tarkwa, Western Region, Ghana, 11-XI-1989, J.S. Yaninek, deposited at ESALQ-USP; 2 paratype females from *Chromolaena odorata*, Beposo, Central Region, Ghana, 12-XI-1989, J.S. Yaninek, deposited at IITAIM; 1 paratype female from unknown plant, Gangnigon, Département du Plateau, Benin, 4-VI-1991, J.S. Yaninek, deposited at IITAIM; 1 paratype female from unknown plant, Gangnigon, Département du Plateau, Benin, 25-VI-1991, B. Eklou, deposited at IITAIM; 1 paratype female from *Manihot esculenta*, International Institute of Tropical Agriculture Station, Abomey-Calvi, Département de l'Atlantique, Benin, 14-IX-1990, I.D. Zannou, deposited at ESALQ-USP; 1 paratype female from unknown plant, Gangnigon, Département du Plateau, Benin, 3-XII-1991, B. Eklou, deposited at ESALQ-USP.

**Etymology.** The name *lobatus* refers to the median lobe present on the posterior margin of the sternal shield of this species.

**Remarks.** *Typhlodromus* (A.) *crassus* differs from this new species by having setae J2, Z4, Z5, S2 and S4 inserted on tubercles and by having macroseta on genu of leg IV. *Typhlodromus* (A.) *gutierrezii*, *T. (A.) paganus* Van der Merwe and *T. (A.) vescus* Van der Merwe also differ by lacking knobbed setae on leg IV in addition to the macrosetae. Furthermore, *T. (A.) gutierrezii* and *T. (A.) paganus* have dorsal shield reticulate, *T. (A.) gutierrezii* has posterior margin of sternal shield almost straight and calyx of spermatheca of *T. (A.) paganus* is a long tube.

### ***Typhlodromus (Anthoseius) lootsi* Schultz**

(Fig. 30)

*Typhlodromus (Anthoseius) lootsi* Schultz, 1972: 17; Moraes *et al.*, 2004: 335; Chant & McMurtry, 2007: 155.

*Amblydromella lootsi*, Moraes *et al.*, 1986: 166.

*Amblydromella (Aphanoseia) lootsi*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 11 paratype females and 13 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV

Dorsum. Dorsal shield 357 (331–393) [354] long and 193 (171–216) [204] wide; reticulate. With 5 pairs of solenostomes. Setae j1 22 (18–25) [22], j3 29 (21–34) [28], j4 20 (13–24) [19], j5 18 (11–21) [17], j6 24 (15–27) [25], J2 29 (19–35) [29], J5 10 (8–13) [10], z2 23 (18–27) [23], z3 28 (19–31) [28], z4 30 (22–34) [28], z5 21 (13–24) [22], Z4 49 (34–56) [52], Z5 54 (43–61) [54], s4 34 (25–40) [33], s6 37 (26–43) [38], S2 44 (27–55) [44], S4 47 (30–56) [50], S5 44 (29–51) [43], r3 27 (20–31) [28], R1 27 (18–31) [30]. Setae smooth and sharp-tipped, except Z5, serrate.

Peritreme. Extending almost to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin with a median lobe; distances between ST1–ST3 64 (60–68) [62], ST2–ST2 50 (47–54) [48]. Genital shield smooth; distance between ST5–ST5 57 (48–64) [56]. Ventrianal shield smooth, pentagonal, with anterior margin almost straight, 119 (109–129) [115] long, 76 (63–88) [78] wide at level of ZV2, 72 (63–85) [73] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); pre-anal pores absent. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 22 (21–25) [21] long, with 1 tooth; fixed digit 23 (21–27) [23] long, with 4 teeth.

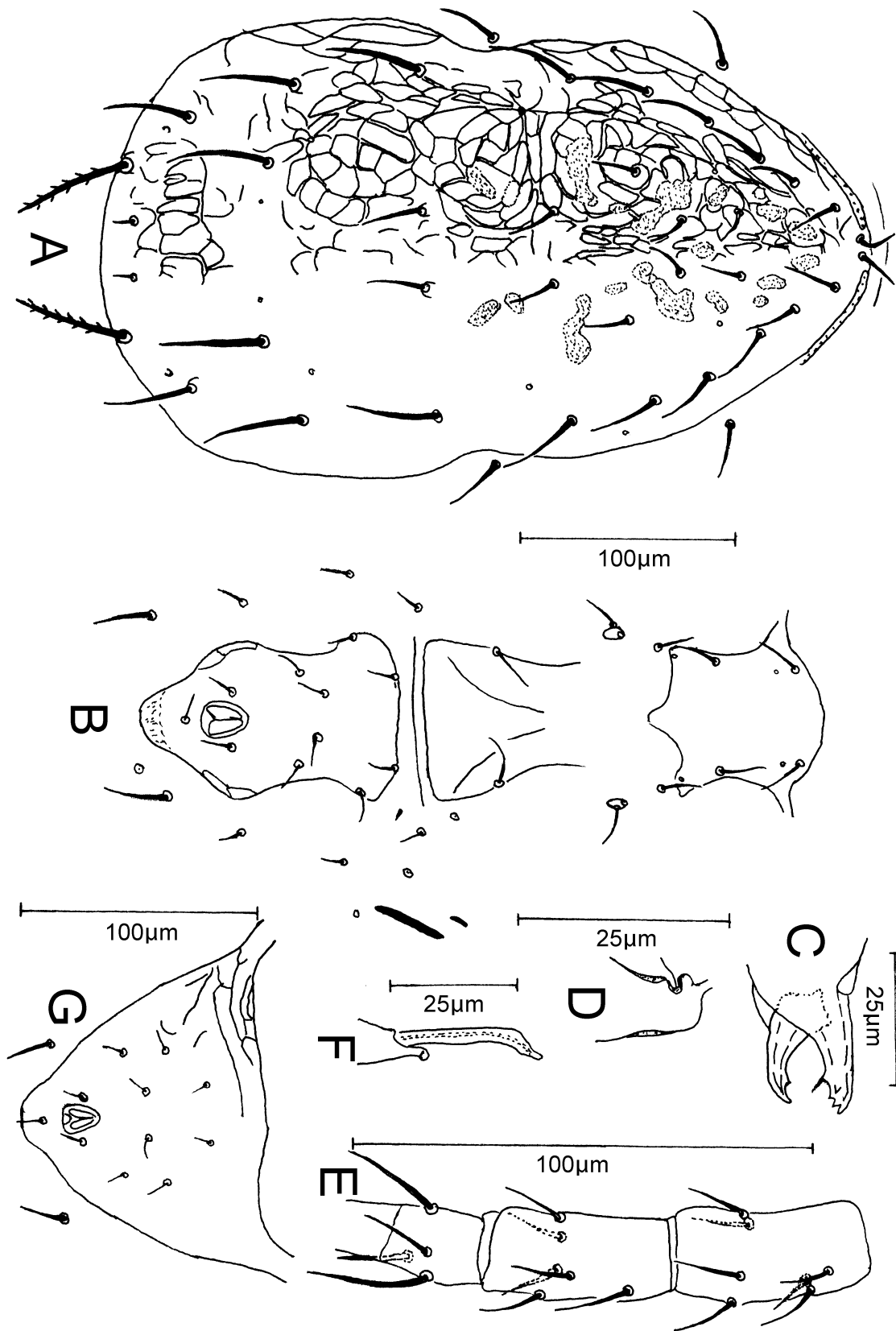
Spermatheca. Calyx bell-shaped, short, broad, 12 (11–15) [13] long, atrium small, incorporated in calyx.

Legs. Macroseta sharp-tipped; St IV, 25 (20–28) [25]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimen measured—South Africa: 3)

Dorsum. Dorsal shield pattern and setae as in female, 268 (258–284) long and 162 (158–171) wide. Setae j1 18 (17–20), j3 22 (21–23), j4 13 (13–14), j5 12 (12–13), j6 15 (14–15), J2 18 (16–20), J5 8 (7–8), z2 17

(14–19), z3 20 (19–21), z4 22 (21–22), z5 14 (13–15), Z4 31 (31–32), Z5 37 (36–39), s4 26 (22–30), s6 25 (25–26), S2 26 (21–29), S4 28 (26–29), S5 28 (26–29), r3 20 (19–22), R1 17 (16–19).



**FIGURE 30.** *Typhlodromus (Anthoseius) lootsi* Schultz: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

Peritreme. Extending almost to level of j1.

Venter. Ventrianal shield subtriangular, reticulate anteriorly to ZV2, fused with peritrematal shields, 104 (98–110) long, 137 (131–145) wide at anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures or pre-anal pores. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Straight, slightly bent distally, shaft 28 (26–30) long.

Legs. Macroseta sharp-tipped; St IV 24.20 (19–21). Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female and 5 paratype females, Northern Cape Province, Boegoeberg, on *Lycium austrinum*, 2-XII-1965, M.K.P. Smith Meyer; 1 paratype female, Free State Province, Glen near Bloemfontein, on *Chrysanthemum* sp., 16-X-1959, M.K.P. Smith Meyer; 2 paratype females from Western Cape Province, Riversdale, on *Citrus* sp., 15-II-1965, M.K.P. Smith Meyer; 1 paratype female, Northern Cape Province, Upington, on *Acacia* sp., 1-XII-1965, M.K.P. Smith Meyer; 1 paratype female, Northern Cape Province, Boegoeberg, on *Psilocaulon* sp., 3-XII-1965, M.K.P. Smith Meyer; 1 paratype female, Eastern Cape Province, Cradock, on *Melianthus comosus*, 29-I-1965, M.K.P. Smith Meyer; 1 female, Northern Cape Province, Augrabies Falls, on *Diospyros lycioides*, 13-IX-1983, E.A. Ueckermann; 1 female, Eastern Cape Province, 10 km from Lady Grey to Bossieslaagte, on *Diospyros austroafricana*, 12-III-1986, M.K.P. Smith Meyer; 1 female and 1 male, Eastern Cape Province, Mountain Zebra National Park, on *Lycium cinereum*, 5-III-1986, E.A. Ueckermann; 2 females, Northern Cape Province, 35 km from Britstown to Victoria-West, on *Ehretia rigida*, 28-09-1988, E.A. Ueckermann; 1 female, Western Cape Province, Karoo National Park near Beaufort-West, on *Rhus burchelli*, 27-IX-1988, E.A. Ueckermann; 1 female, Western Cape Province, Meiringspoort near Oudtshoorn, on an unidentified plant, 22-IX-1988, J.C.S. Barnard; 3 females and 2 males, Northern Cape Province, Greenfields (farm) near Douglas, on *Acacia robusta*, 8-III-1996, E.A. Ueckermann; 1 female, Northern Cape Province, Greenfields (farm) near Douglas, on *Acacia haematoxylon*, 7-III-1996, E.A. Ueckermann; 1 female, Northern Cape Province, Sutherland, on *Walafrida articulata*, 3-IX-1991, E.A. Ueckermann; 1 female, Northern Cape Province, Sutherland, on *Eriocephalus pubescens*, 3-IX-1991, M.K.P. Smith Meyer.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) malawiensis* Zannou, Moraes & Hanna

*Typhlodromus (Anthoseius) malawiensis* Zannou *et al.*, 2002: 4; Chant & McMurtry, 2007: 155.

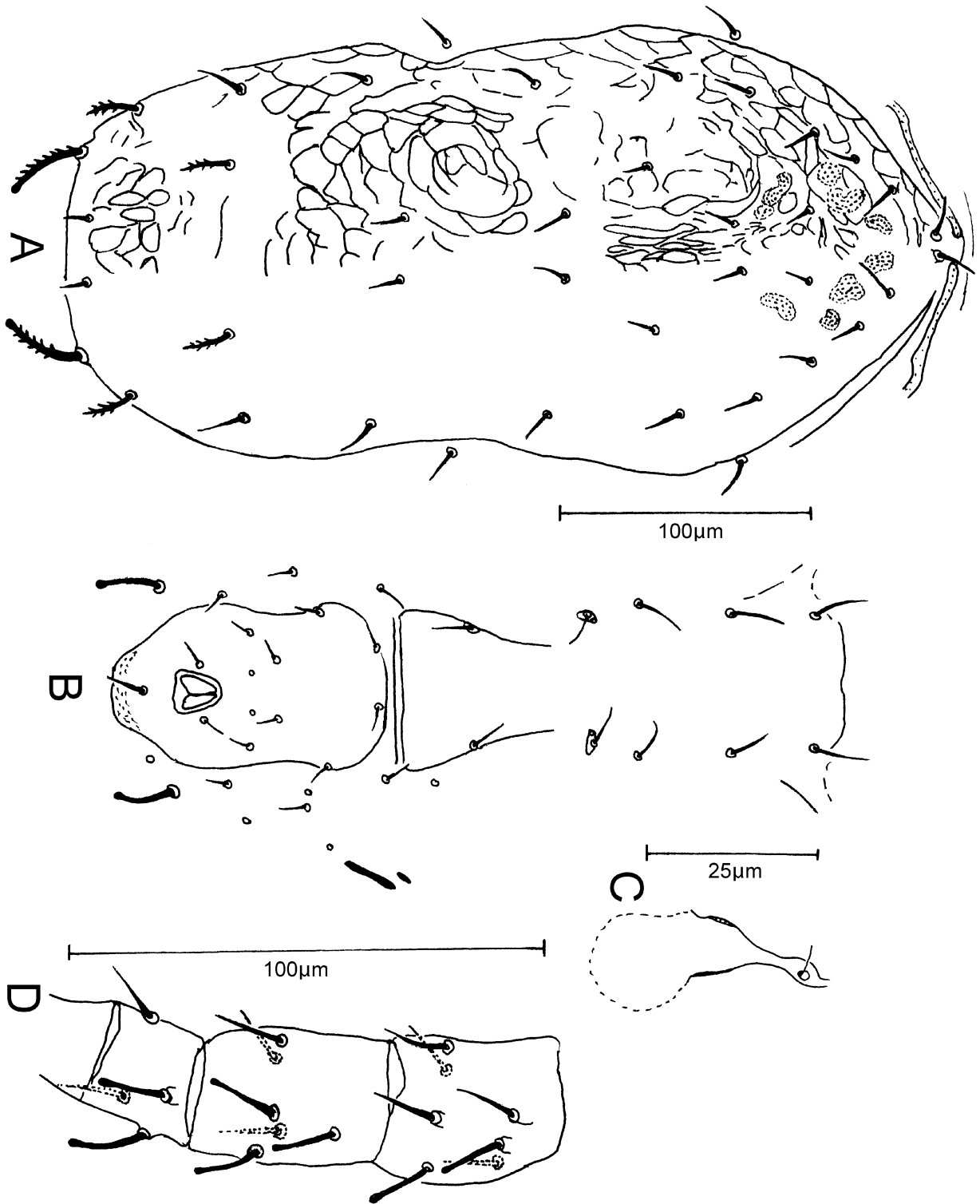
**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield reticulate; dorsal setae smooth and sharp-tipped, except Z4, serrate, and Z5, serrate and blunt; seta Z4 1.3 times as long as distance between its base and that of S5; setae r3 and R1 inserted on integument; seta ST3 off sternal shield; posterior margin of sternal shield with a median lobe; ventrianal shield pentagonal and smooth, with 4 pairs of pre-anal setae (seta JV3 present); calyx of spermatheca funnel-shaped; peritreme extending anteriorly to level of j1; with a single and knobbed macroseta on basitarsus of leg IV. Described from specimens collected at 1.3 km N Salima Military Camp, Malawi, on *Musa* sp.

**World distribution.** Malawi.

### *Typhlodromus (Anthoseius) matthyssei* Ueckermann & Loots (Fig. 31)

*Typhlodromus (Anthoseius) matthyssei* Ueckermann & Loots, 1988: 36; Moraes *et al.*, 2004: 337; Chant & McMurtry, 2007: 155.

*Amblydromella (Aphanoseia) matthyssei*, Denmark & Welbourn, 2002: 308.



**FIGURE 31.** *Typhlodromus (Anthoseius) matthyssei* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

FEMALE. (Specimens measured—Nigeria: holotype and 1 paratype). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield (354) [355] long and (177) [168] wide; reticulate. With 5 pairs of solenostomes, not indicated in fig 31A. Setae j1 14 [14], j3 14 [14], j4 11 [11], j5 11 [12], j6 12 [15], J2 17 [16], J5 8 [9], z2 15 [13], z3 15 [15], z4 16 [17], z5 12 [13], Z4 24 [22], Z5 34 [34], s4 18 [16], s6 19 [17], S2 16 [19], S4 22



[21], S5 20 [22], r3 15 [16], R1 15 [16]. Setae smooth and sharp-tipped, except Z4 and S5, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, indistinctly outlined; distances between ST1-ST3 68 [51], ST2-ST2 56 [53]. Genital shield smooth; distance between ST5-ST5 [45]. Ventrianal shield smooth, pentagonal, with anterior margin convex, 115 [110] long, [67] wide at level of ZV2, 69 [65] wide at level of anus; with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 29 long, with 2 – 3 teeth; fixed digit 21 long, with 3 teeth.

Spermatheca. Calyx funnel-shaped, proximal half slender, distal half broad, 16 long; atrium bulged.

Legs. Without macrosetae. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. Nigeria:** Holotype and 1 paratype females, Ibadan, on *Spathodea campanulata*, 8-XI-1975, J.G. Matthyse.

**Remarks.** Genu, tibia and basitarsus of leg IV with 2, 3 and 2 subequal knobbed setae, respectively.

**World distribution.** Nigeria.

### *Typhlodromus (Anthoseius) michaeli* Ueckermann & Loots

(Fig. 32)

*Typhlodromus (Anthoseius) michaeli* Ueckermann & Loots, 1988: 31; Moraes *et al*, 2004: 337.

*Amblydromella (Aphanoseia) michaeli*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimen measured—South Africa: holotype, 9 paratypes and 3 additional specimens; Zambia: 2). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield, 348 (324–384) [349] long and 183 (177–216) [177] wide; reticulate, with some roundish and elongate elements centrally. With 5 pairs of solenostomes. Setae j1 21 (17–26) [22], j3 22 (19–26) [23], j4 17 (14–25) [17], j5 18 (15–27) [20], j6 22 (16–29) [23], J2 24 (19–33) [24], J5 11 (10–13) [12], z2 19 (16–26) [21], z3 20 (17–28) [21], z4 22 (19–29) [23], z5 20 (18–26) [20], Z4 29 (26–33) [31], Z5 39 (39–47) [43], s4 25 (24–32) [26], s6 26 (23–33) [29], S2 30 (26–34) [30], S4 34 (32–46) [37], S5 26 (23–30) [29], r3 20 (18–25) [18], R1 23 (19–30) [23]. Setae sharp-tipped and serrate, except J5, smooth; and Z5, knobbed.

Peritreme. Extending to level of j1.

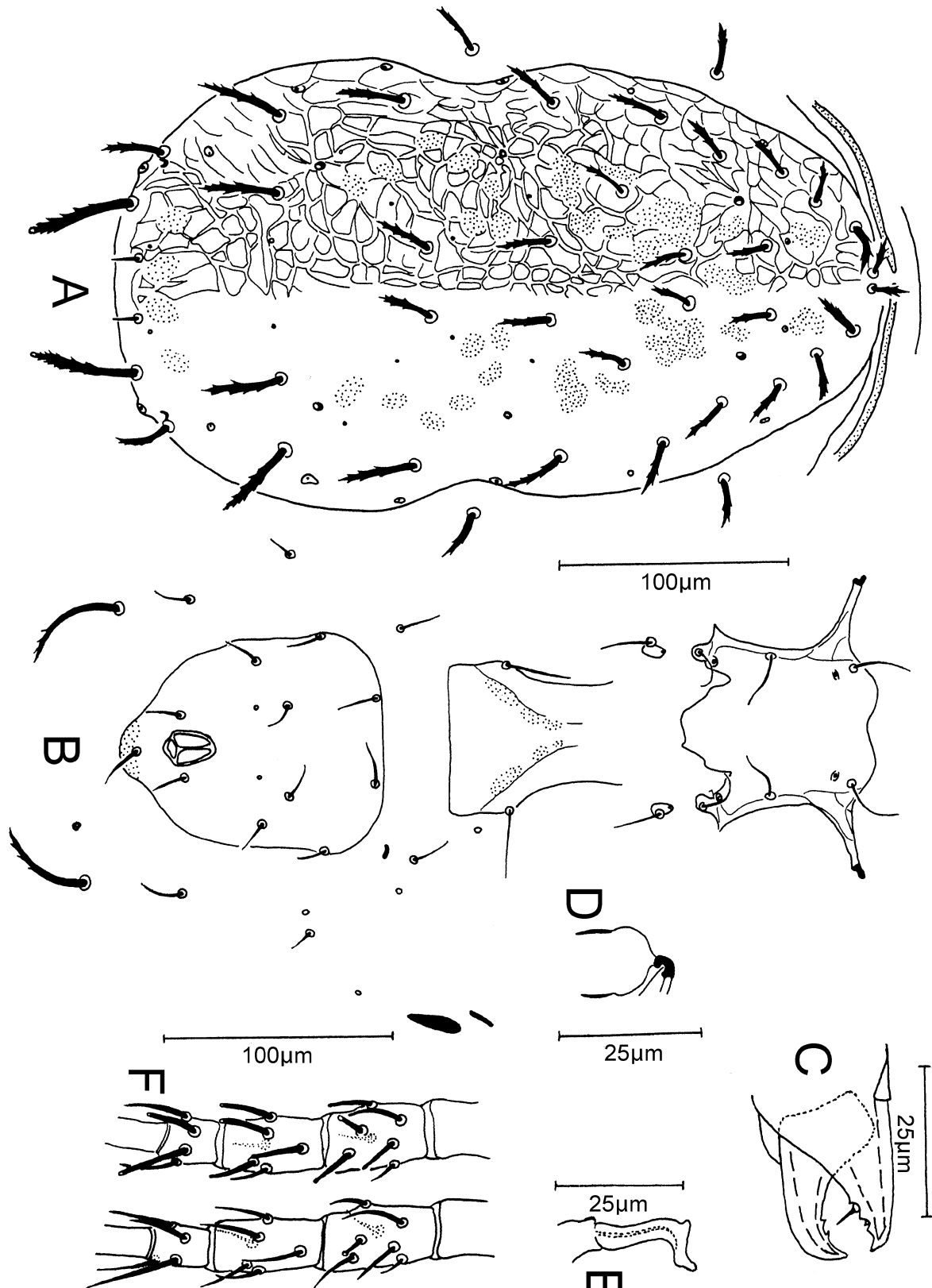
Venter. Sternal shield smooth, with 2 (ST3 on integument) or 3 pairs of setae; posterior margin with a median lobe; distances between ST1–ST3 64 (60–69) [65], ST2–ST2 57 (55–62) [56]. Genital shield smooth; distance between ST5–ST5 64 (58–69) [61]. Ventrianal shield smooth, subquadrate, with anterior margin slightly concave, 123 (113–132) [119] long, 105 (99–110) [104] wide at level of ZV2, 92 (83–106) [85] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posterior to and almost longitudinally aligned with JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate, knobbed or not.

Chelicera – Movable digit 29 (27–31) [30] long, with 2 teeth; fixed digit 26 (21–29) [25] long, with 4 teeth.

Spermatheca. Calyx bell-shaped, with distal half thick-walled, 16 (13–19) [19] long; atrium small, nodular.

Legs. Macrosetae on leg IV short, stout and knobbed on genu, sharp-tipped or knobbed on tarsus; Sge IV 11 (8–15) [8], St IV 30 (26–38). These segments also bear several knobbed setae each in addition to macrosetae. Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 2)



**FIGURE 32.** *Typhlodromus (Anthoseius) michaeli* Ueckermann & Loots: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Male- Spermatodactyl; F. Female—Leg IV.

Dorsum. Dorsal shield pattern and setae as in female, 285 (284–285) long and 167 wide. Setae j1 17, j3 17, j4 12 (10–13), j5 13 (11–14), j6 13, J2 16 (15–16), J5 9 (8–9), z2 13 (11–15), z3 13 (12–14), z4 15 (13–16), z5 13 (11–15), Z4 21, Z5 31, s4 17 (16–18), s6 19 (17–20), S2 19 (18–19), S4 20, S5 15 (14–16), r3 16

(14–17), R1 16 (15–16). Caudoventral setae smooth and sharp-tipped, except JV5, serrate and knobbed.

Peritreme. Extending almost to level of j1.

Venter. Ventrianal shield subtriangular, with few striations, fused with peritrematal shields, 101 (98–104) long, 121 (119–122) wide at anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures; minute round pre-anal pores posterior to and almost longitudinally aligned with JV2. Shield in both paratype specimens not suitable for drawing.

Spermatodactyl. L-shaped, shaft 18 long.

Legs. Macrosetae knobbed; Sge IV 13 (11–14), St IV 24 (21–26). Chaetotaxy of genua II and III as in female.

**Specimens examined. Zambia:** 2 females, 30 km W Mpika, on *Parinari curatellifolia*, 17-VI-1992, A. Onzo. **South Africa:** Holotype female and 3 paratype females, Limpopo Province, Letaba Estates, on *Citrus sinensis*, 9-XII-1980, M.K.P. Smith Meyer; 1 paratype female, Mpumalanga Province, Mont Rose, on *Dichrostachys cinerea*, 25-III-1976, L. Venter; 1 paratype female, Limpopo Province, near Zebediela, on *Vangueria infausta*, 23-II-1976, L. Venter; 1 paratype female and 2 paratype males, Gauteng Province, Rood-eplaas near Pretoria, on *Acacia caffra*, 29-XI-1979, E.A. Ueckermann; 1 paratype female, Kwazulu/Natal, 25 km from Jozini to Ingwavuma, on *Maytenus senegalensis*, 19-IX-1972, F.W. Schultz; 1 paratype female Eastern Cape Province, 15 km from East London to Umtata, on *Sida rhombifolia*, 9-II-1974, F.W. Schultz; 1 female, Mpumalanga Province, 21 km from Nelspruit to Kaapmuiden, on *Lantana camara*, 6-II-1985, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Aliwal North, on *Ulmus parvifolia*, 12-III-1986, E.A. Ueckermann; 1 female, Mpumalanga Province, Crocodile Bridge, Kruger National Park, on unidentified plant, 5-II-1985, E.A. Ueckermann.

**Remarks.** Length of dorsal setae of specimens examined varies considerably between and within countries. One of the two specimens from Zambia has the longest dorsal setae and sharp St IV. In addition to the macrosetae on genu and basitarsus of leg IV, the specimen from Zambia also has 4, 4 and 1 knobbed setae on genu, tibia and basitarsus; respectively. Both specimens have 3 pairs of sternal setae and seta JV5 sharp-tipped; all specimens from South Africa have 2 pairs of sternal setae (ST3 inserted on integument), seta JV5 knobbed and one knobbed macroseta on each of genu and basitarsus of leg IV. A few South African specimens may also have an extra small knobbed seta on tibia IV.

**World distribution.** South Africa and Zambia.

### *Typhlodromus (Anthoseius) microbullatus* Van der Merwe (Fig. 33)

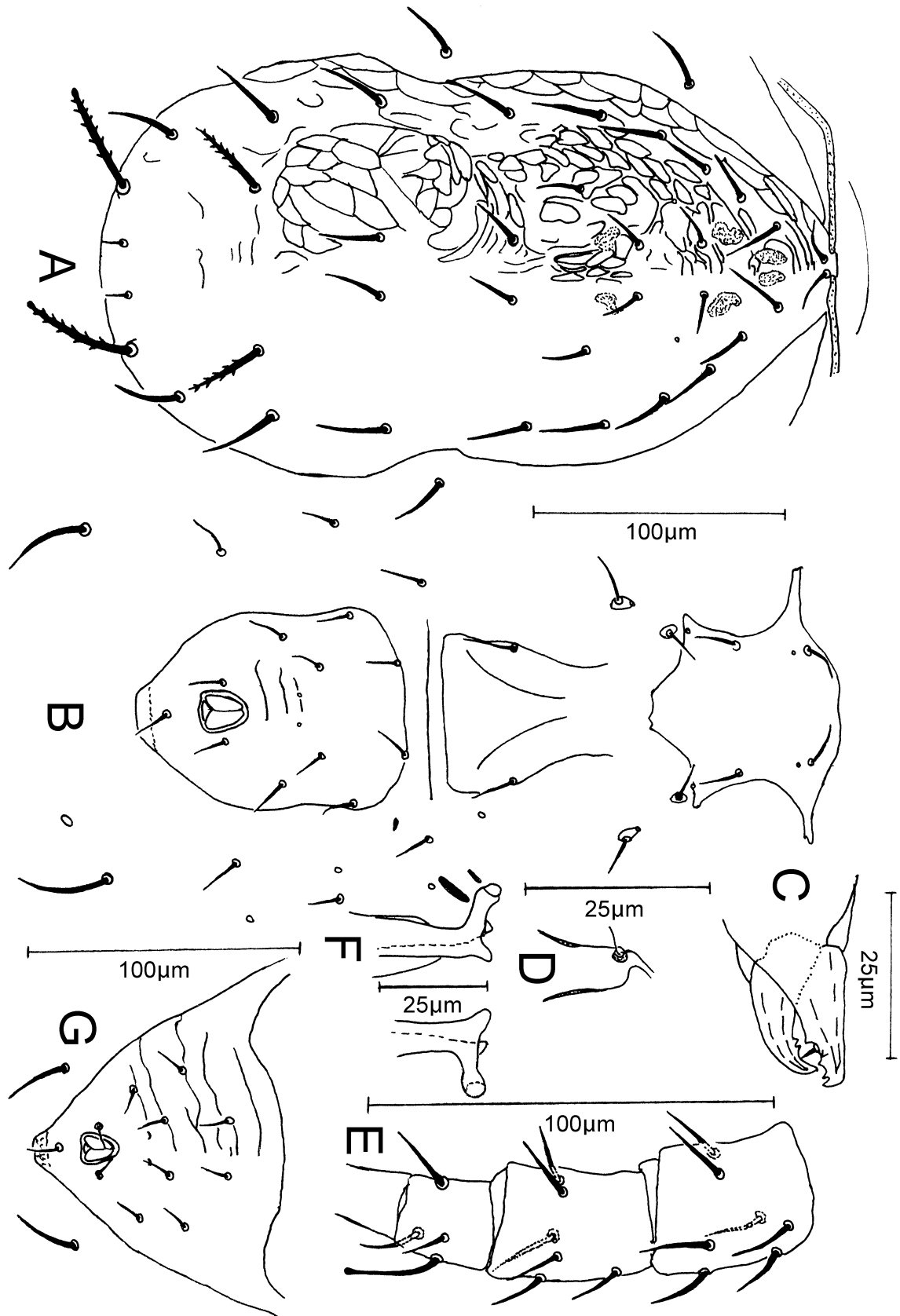
*Typhlodromus (Anthoseius) microbullatus* Van der Merwe, 1968: 33; Moraes *et al.*, 2004: 338; Chant & McMurtry, 2007: 155.

*Amblydromella microbullata*, Moraes *et al.*, 1986: 167.

*Amblydromella (Aphanoseia) microbullata*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 9 paratypes and 6 additional specimens) – Idiosomal setal pattern 12A:8A/JV: ZV.

Dorsum. Dorsal shield 292 (276–306) [293] long and 158 (147–172) [155] wide; reticulate between j1 and Z4, and faintly striate posteriorly. With 5 pairs of solenostomes, not all indicated in fig 33. Setae j1 19 (16–21) [19], j3 25 (20–26) [25], j4 17 (14–19) [17], j5 17 (13–19) [17], j6 20 (17–22) [22], J2 25 (21–28) [26], J5 11 (9–11) [11], z2 19 (17–23) [19], z3 23 (18–27) [22], z4 24 (20–26) [26], z5 19 (16–20) [18], Z4 31 (28–34) [30], Z5 45 (40–55) [43], s4 26 (23–28) [27], s6 27 (24–30) [28], S2 29 (25–33) [30], S4 29 (26–33) [29], S5 28 (25–33) [28], r3 24 (22–29) [24], R1 23 (20–28) [23]. Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and often slightly knobbed.



**FIGURE 33.** *Typhlodromus (Anthoseius) microbullatus* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male— F. Spermatodactyl; G. Ventrianal shield.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a tridentate median projection; distances between ST1–ST3 55 (51–58) [54], ST2–ST2 47 (43–50) [43]. Genital shield smooth; distance between ST5–ST5 45 (41–49) [45]. Ventrianal shield mostly smooth, with few median striae between JV2 and anus, pentagonal, with anterior margin slightly convex, 97 (91–107) [98] long, 75 (67–83) [75] wide at level of ZV2, 71 (62–83) [72] wide at level of anus; with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudovertral setae smooth and sharp-tipped.

Chelicera. Movable digit 22 (21–24) [22] long, with 2 teeth; fixed digit 21 (19–23) [21] long, with 4 teeth.

Spermatheca. Calyx bell-shaped, 11 (8–15) [12] long.

Legs. Macroseta knobbed; St IV 21 (17–24) [21]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimen measured – South Africa: 1)

Dorsum. Dorsal shield pattern and setae as in female, 229 long and 123 wide. Setae j1 15, j3 19, j4 14, j5 12, j6 16, J2 18, J5 10, z2 17, z3 20, z4 20, z5 16, Z4 22, Z5 30, s4 20, s6 18, S2 22, S4 22, S5 21, r3 20, R1 15. Caudovertral setae smooth and sharp-tipped.

Peritreme. Extending almost to level of j1.

Venter. Ventrianal shield subtriangular, striate anteriorly to JV3, fused with peritrematal shields, 91 long, 108 wide at the anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures; elliptical pre-anal pores posteromesad of JV2. Caudovertral setae smooth and sharp-tipped.

Spermatodactyl. L-shaped, shaft 19 long.

Legs. Macroseta knobbed; St IV 17. Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female and 4 paratype females, Kwazulu/Natal, Munster, on unidentified plant, 15-IV-1955, M.K.P. Smith Meyer; 1 paratype female, Kwazulu/Natal, Munster, on *Ficus carica*, 15-IV-1955, M.K.P. Smith Meyer; 1 paratype female, Kwazulu/Natal, Insuzi Drift, Tugela River, Kranskop on *Croton sylvaticus*, 28-II-1962, G.G. van der Merwe; 1 paratype female, Eastern Cape Province, East London, on *Dalechampia capensis*, 16-I-1965, G.G. van der Merwe; 1 paratype female, Eastern Cape Province, Igoda River near East London, on *Rhus pyroides*, 17-I-1965, G.G. van der Merwe; 1 paratype female, Kwazulu/Natal, Palm Beach, on unidentified plant, 19-IV-1955, M.K.P. Smith Meyer; 1 female, Limpopo Province, Moria near Polokwane, on *Ximenia caffra*, 24-V-1983, E.A. Ueckermann; 2 females, Kwazulu/Natal, Port Edward, on *Senecio polyanthemoides*, 5-IX-1990, E.A. Ueckermann; 1 male and 1 female, Mpumalanga Province, Blyde River Canyon near Graskop, on *Rubus rigidus*, 23-II-1978, M.K.P. Smith Meyer; 1 female, Western Cape Province, George, on *Dryopteris* sp., 1-II-1994, E. van den Berg; 1 female, Western Cape Province, George, on *Erica* sp., 1-II-1994, E. van den Berg; 1 female, Limpopo Province, Gibraltar Kloof near Penge, on *Maesa lanceolate* var. *rufescens*, 11-X-1985, S. Naser.

**World distribution.** Madagascar, Mozambique and South Africa.

### *Typhlodromus (Anthoseius) muliebris* Van der Merwe

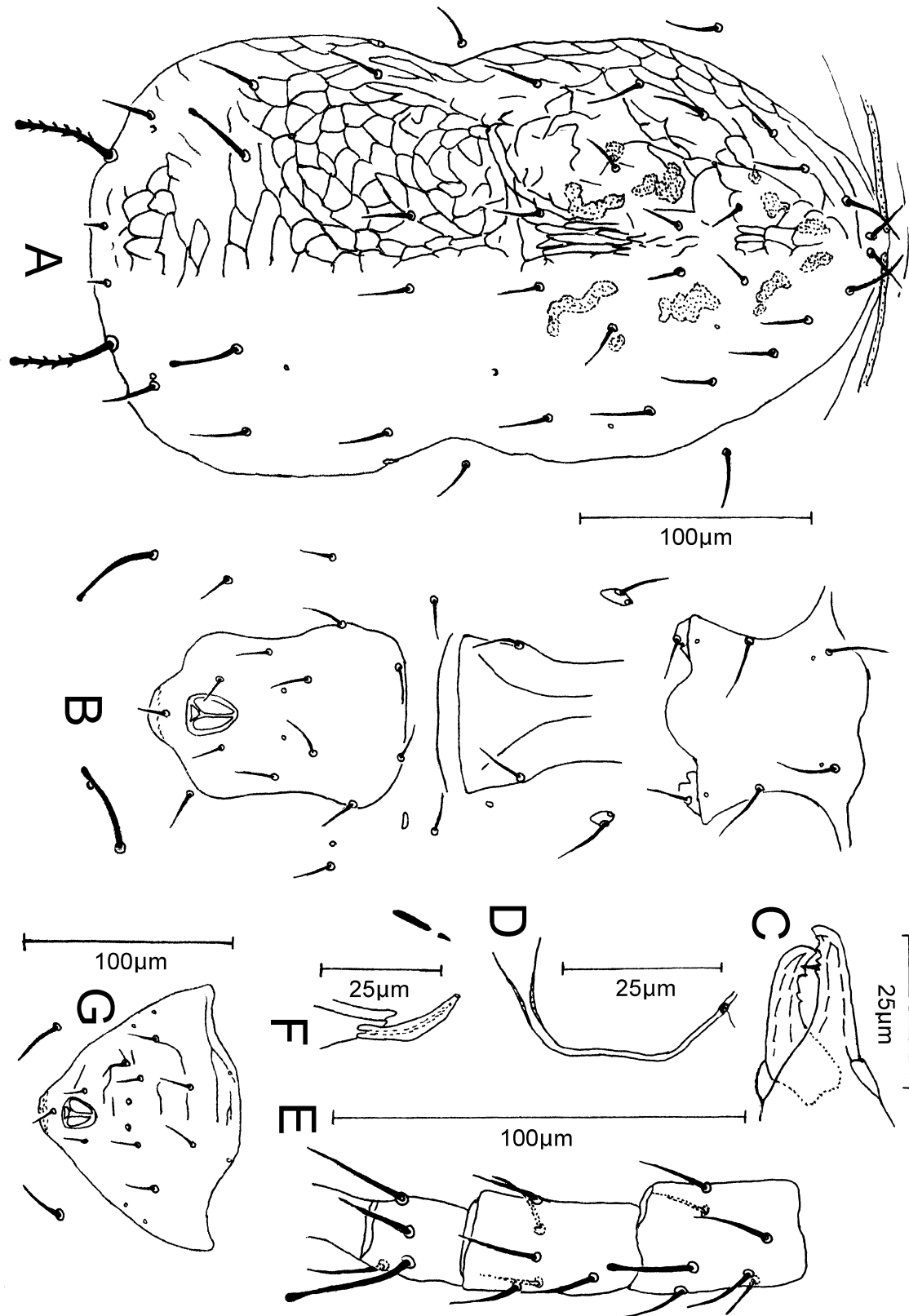
(Fig. 34)

*Typhlodromus (Anthoseius) muliebris* Van der Merwe, 1968: 28; Moraes *et al.*, 2004: 338; Chant & McMurtry, 2007: 155.

*Amblydromella muliebris*, Moraes *et al.*, 1986: 168.

*Amblydromella (Amblydromella) muliebris*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 1 paratype and 1 additional specimen). Idiosomal setal pattern 12A:8A/JV:ZV.



**FIGURE 34.** *Typhlodromus (Anthoseius) muliebris* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

Dorsum. Dorsal shield 348 (346–350) [349] long and 188 (186–190) [188] wide; reticulate. With 5 pairs of solenostomes. Setae j1 19 (14–22) [21], j3 28 (28–29) [28], j4 17 (16–17) [16], j5 16 (15–17) [17], j6 18 [18], J2 23 [23], J5 10 (10–11) [10], z2 20 (18–21) [21], z3 23 (22–26) [22], z4 24 (22–27) [23], z5 17 (16–19)

[17], Z4 27 (26–28) [26], Z5 46 (43–49) [43], s4 25 (23–28) [24], s6 27 (26–28) [26], S2 26 (24–28) [26], S4 25 (23–26) [25], S5 22 (21–24) [24], r3 25 (23–28) [25], R1 19 (18–21) [18]. Setae smooth and sharp-tipped, except Z4, slightly knobbed, and Z5, serrate and slightly knobbed or sometimes sharp-tipped.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a median lobe; distances between ST1–ST3 63 (61–66) [61], ST2–ST2 62 (60–64) [62]. Genital shield smooth; distance between ST5–ST5 56 (54–57) [57]. Ventrianal shield smooth, pentagonal, with anterior margin convex, (116) [116] long, (84) [84] wide at level of ZV2, 76 (75–77) [75] wide at level of anus; with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 27 (26–27) [27] long, with 3 teeth; fixed digit 29 (28–29) [29] long, with 6 teeth (1 tooth at the same level with pilus dentilus).

Spermatheca. Calyx long, slender, flaring toward vesicle 51 (50–58) [46] long; atrium small and nodular.

Legs. Macrosetae knobbed; Sge IV 19 (18–20) [20], St IV 27 (26–28) [28]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimen measured—South Africa: 1)

Dorsum. Dorsal shield pattern and setae as in female, 259 long and 161 wide. Setae j1 14, j3 23, j4 12, j5 12, j6 14, J2 14, J5 9, z2 14, z3 15, z4 15, z5 13, Z4 23, Z5 33, s4 16, s6 17, S2 17, S4 15, S5 15, r3 19, R1 17. Caudoventral setae smooth and sharp-tipped.

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, striate, free from peritrematal shields, 96 long, 126 wide at anterior corners; with 4 pairs of pre-anal setae on one side and 3 pairs on other, and 3 distinguishable pairs of lyrifissures (1 next to anterior margin, 1 laterad and almost transversally aligned with ZV2 and 1 laterad and well posterior to ZV2); round pre-anal pores posteromesad of JV2.

Spermatodactyl. Curved, shaft 20 long.

Legs. Macrosetae knobbed; Sge IV 13, St IV 22. Chaetotaxy of genera II and III as in female.

**Specimens examined. South Africa:** Holotype female, 1 paratype female and 1 paratype male, Mpumalanga Province, Nelspruit on *Bequaertiodendron magaliesmontanum*, 2-IV-1955, P.A.J. Ryke; 1 female, Mpumalanga Province, Lower Sabie, Kruger National Park, on an unidentified plant, 7-X-1981, E.A. Ueckermann.

**World distribution.** South Africa.

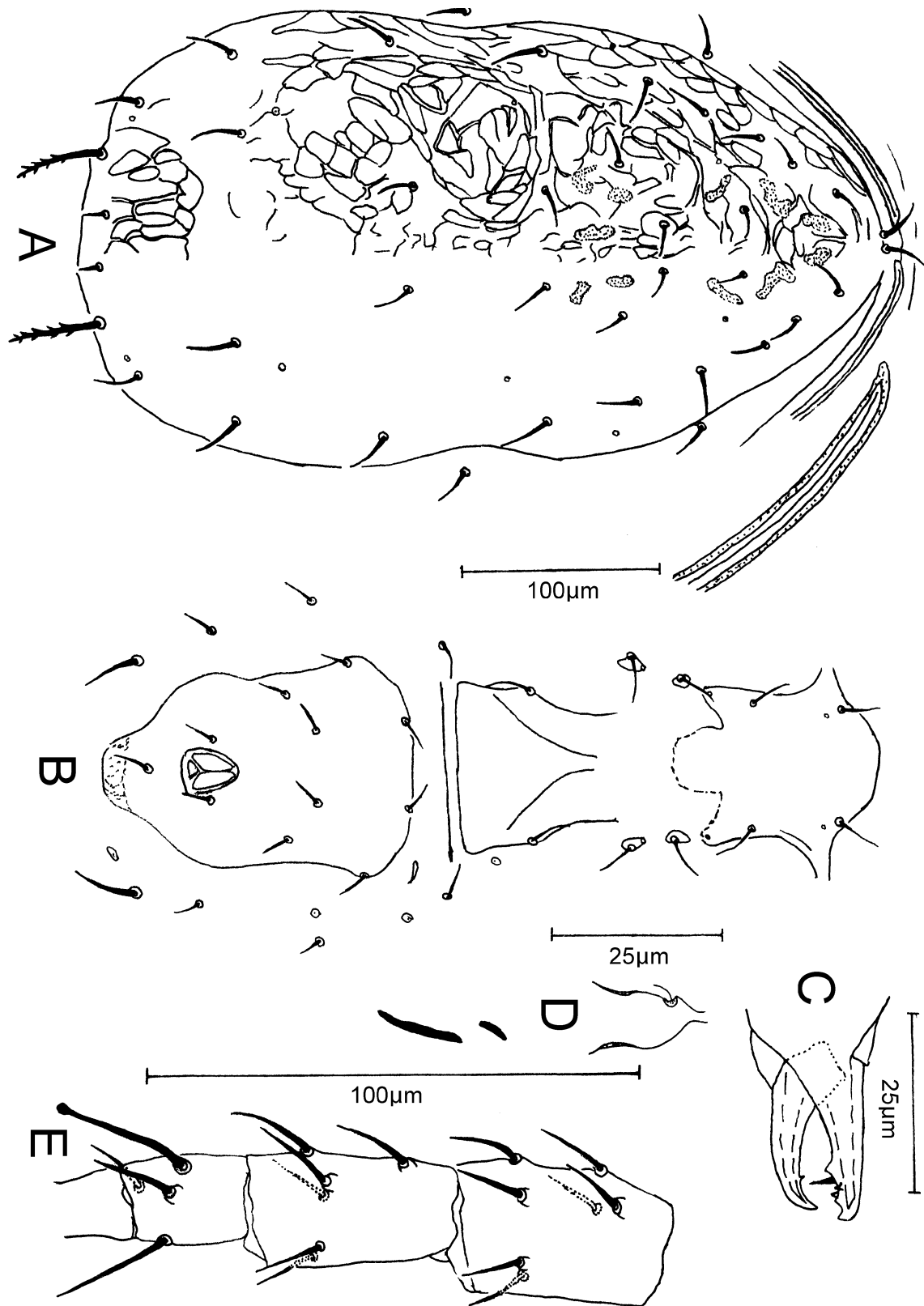
### *Typhlodromus (Anthoseius) namaquaensis* Ueckermann & Loots (Fig. 35)

*Typhlodromus (Anthoseius) namaquaensis* Ueckermann & Loots, 1988: 16; Moraes *et al.*, 2004: 338; Chant & McMurtry, 2007: 155.

*Amblydromella (Aphanoseia) namaquensis* [sic], Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype and 3 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 408 (384–429) [384] long and 221 (206–227) [206] wide; reticulate. With 5 pairs of solenostomes. Setae j1 20 [20], j3 18 (16–20) [20], j4 13 (11–15) [15], j5 12 (10–14) [14], j6 14 (11–16) [16], J2 16 (17–19) [19], J5 11 (10–12) [12], z2 14 (13–14) [14], z3 16 (14–19) [19], z4 17 (14–20) [20], z5 14 (12–16) [16], Z4 22 (20–25) [25], Z5 41 (38–43) [43], s4 18 (16–23) [23], s6 20 (18–25) [25], S2 22 (19–26) [26], S4 23 (22–25) [25], S5 19 (17–21) [21], r3 18 (16–21) [21], R1 18 (16–21) [21]. Setae smooth and sharp-tipped, except Z5, serrate.



**FIGURE 35.** *Typhlodromus (Anthoseius) namaquaensis* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a weakly outlined median lobe; distances between ST1–ST3 74 (73–75), ST2–ST2 56 (55–58). Genital shield



smooth; distance between ST5–ST5 70 (67–76) [67]. Ventrianal shield smooth, pentagonal, with anterior margin convex, 141 (133–145) [133] long, 104 (100–108) [100] wide at level of ZV2, 93 (87–100) [87] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); pre-anal pores absent. With 2 pairs of metapodal shield. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 28 (27–29) [27] long, with one tooth; fixed digit 32 (31–32) [31] long, with 4 teeth.

Spermatheca. Calyx bell-shaped, (15) long; atrium small, incorporated in calyx.

Legs. Macroseta knobbed; StIV IV 28 (25–30) [30]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female, Northern Cape Province, 47 km from Port Nolloth to Steinkopf, on *Galenia sarcophylla*, 19-IX-1983, M.K.P. Smith Meyer; 3 females, Northern Cape Province, Victoria West, on a plant species of the family Mesembryanthemaceae, 16-IX-1988, E.A. Ueckermann.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) ndibu* Pritchard & Baker

*Typhlodromus (Neoseiulus) ndibu* Pritchard & Baker, 1962: 221.

*Amblydromella ndibu*, Matthyse & Denmark, 1981: 351; Moraes *et al.*, 1986: 168.

*Amblydromella (Amblydromella) ndibu*, Denmark & Welbourn, 2002: 307.

*Typhlodromus (Anthoseius) ndibu*, Moraes *et al.*, 2004: 339; Chant & McMurtry, 2007: 155.

**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield strongly reticulate; dorsal setae smooth and sharp-tipped, except Z4, serrate, and Z5, serrate and knobbed; setae r3 and R1 inserted on integument; seta ST3 on sternal shield; posterior margin of sternal shield straight; ventrianal shield pentagonal, with 4 pairs of pre-anal setae (seta JV3 present); JV5 knobbed; calyx of spermatheca funnel-shaped; peritreme extending to level of j1; with knobbed macrosetae on genu and tibia of leg III and on genu, tibia and basitarsus of leg IV. Described from specimens collected at Bandundu, Democratic Republic of Congo (former Zaire), on *Casuarina equisetifolia*. No additional specimens were collected in the present study.

**World distribution.** Indonesia, Nigeria, Republic of Congo and Rwanda.

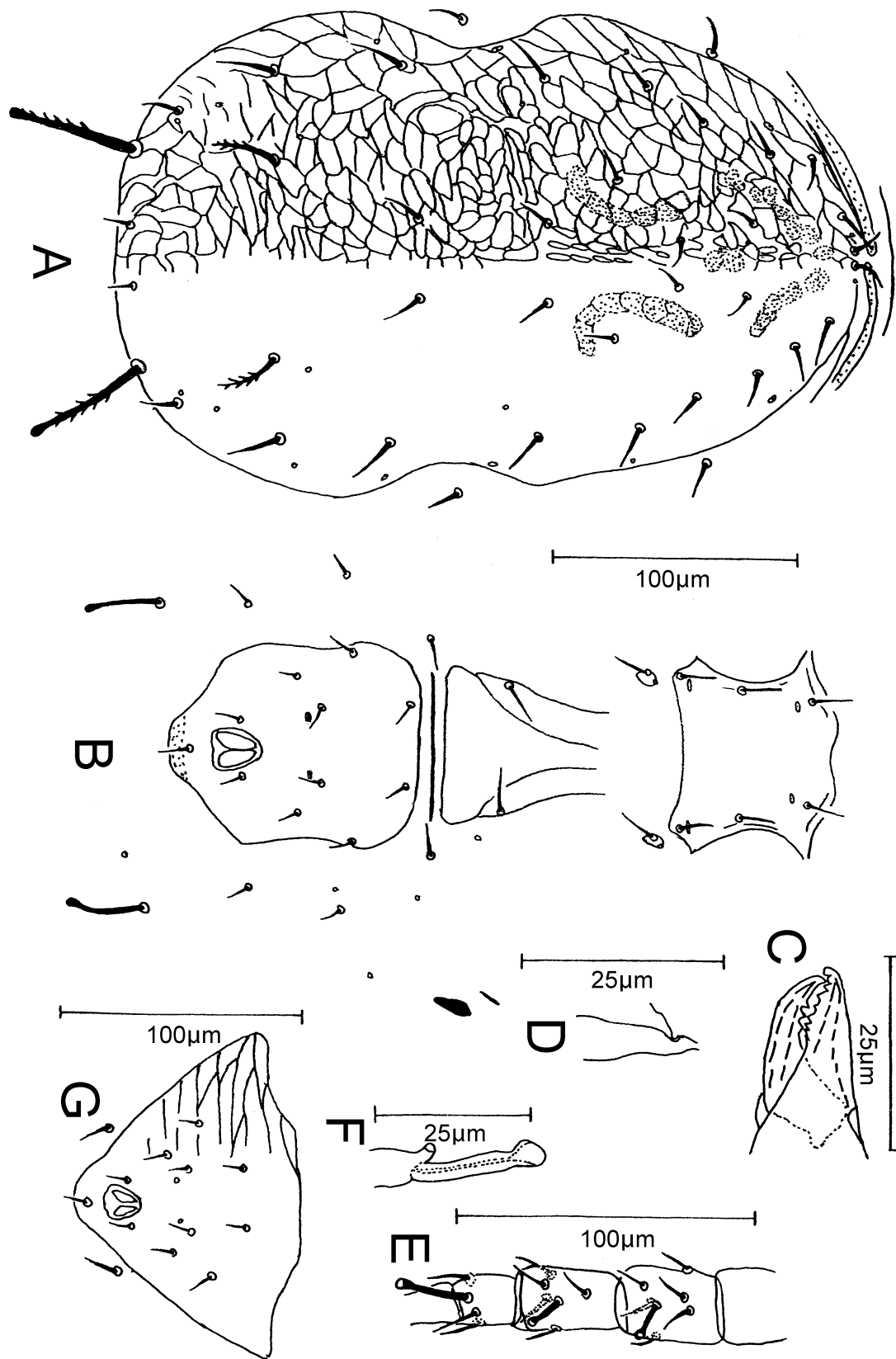
### *Typhlodromus (Anthoseius) neogutierrezii* Zannou, Moraes & Oliveira, n. sp.

(Fig. 36)

**Diagnosis.** This species is distinct by having dorsal shield reticulate; dorsal setae smooth and sharp-tipped, except Z4 serrate, sharp-tipped or knobbed, and Z5, serrate and knobbed; Z4 as long as the distance between its base and the base of S4, S5 about half as long as S4; sternal shield with 3 pairs of setae (ST3 on shield), with posterior margin straight; knobbed macrosetae on genu and tibia of leg III and on genu, tibia and basitarsus of leg IV. Furthermore, the spermatodactyl of the male is straight, slightly constricted distally and knobbed.

**FEMALE.** (4 specimens measured). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield, 312 (299–328) long and 190 (186–194) wide, reticulate. With 5 pairs of solenostomes, only gd2 not indicated in fig 36A. Setae j1 18 (16–22), j3 19 (18–19), j4 14 (13–14), j5 15 (13–16), j6 18 (16–19), J2 22 (19–24), J5 10 (8–11), z2 16 (14–18), z3 18 (18–19), z4 20 (18–21), z5 17 (16–18), Z1 18, Z4 29 (27–34), Z5 46 (40–51), s4 22 (19–24), s6 22 (21–24), S2 26 (22–29), S4 26 (24–29), S5 14 (10–18), r3 18 (16–19), R1 17 (16–18). Setae smooth and sharp-tipped, except Z4, serrate and sometimes knobbed, and Z5, serrate and knobbed.



**FIGURE 36.** *Typhlodromus (Anthoseius) neogutierrezii* Zannou, Moraes & Oliveira, **n. sp.**: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin straight; distances between ST1–ST3 56 (54–56), ST2–ST2 60 (56–61). Genital shield smooth; distance between ST5–ST5 58 (58–59). Ventrianal shield smooth, pentagonal, with anterior margin slightly convex, 104 (99–112) long, 90 (82–99) wide at level of ZV2, 81 (69–88) wide at level of anus, with 4 pairs of pre-anal setae (JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 22 long, with 3 teeth; fixed digit 22 long, with 5–6 teeth.

Spermatheca. Calyx saccular, 11 (8–13) long; atrium distinct.

Legs. Macrosetae knobbed: Sge III 10 (6–11), Sti III 14 (13–14), Sge IV 11 (8–14), Sti IV 16 (14–19), St IV 25 (21–29). Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (2 specimens measured)

Dorsum. Dorsal shield pattern and setae as in female, 240 (238–241) long and 150 (1146–154) wide. Setae j1 14 (13–15), j3 17 (16–17), j4 11 (10–12), j5 11, j6 14 (13–14), J2 16, J5 9, z2 12 (11–12), z3 14, z4 15 (14–15), z5 12 (11–12), Z4 21 (20–21), Z5 32 (31–32), s4 17 (16–17), s6 18 (17–18), S2 18, S4 16, S5 12, r3 16, R1 14 (13–14).

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, reticulate, free from peritrematal shields, 92 (91–92) long, 138 (136–139) wide at anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures; round pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Straight, slightly constricted distally, terminating into a knob, shaft 22 long.

Legs. Macroseta sharp-tipped; St IV 18. Chaetotaxy of genua II and III as in female.

**Locality and type material.** Holotype female, 3 paratype females, allotype male and 1 paratype male from *Citrus* sp., Kyankonwa, Uganda, 5-X-1990, J.S. Yaninek, deposited at ESALQ-USP; 1 paratype female from unknown plant, 26 km N Bundibugyo, Uganda, 9-X-1990, J.S. Yaninek, deposited at IITAIM. One paratype female from *Persea americana*, 11 km W Diang, Cameroon, 4-I-1991, L. Louis, deposited at IITAIM.

**Etymology.** The name *neogutierrezii* refers to the similarity between this species and *T. (A.) gutierrezii*.

**Remarks.** Seta z6 is present in one of the paratype females from Uganda. The presence of seta z6 is a typical characteristic of the tribe Paraseiulini Wainstein. Two of the types from Uganda have Z4 knobbed, while this seta is sharp-tipped in the others. *Typhlodromus (A.) ndibu* differs from this new species by having calyx of spermatheca funnel-shaped and atrium undifferentiated. *Typhlodromus T. (A.) gutierrezii* also differs by lacking macrosetae on genu and tibia of leg III. Furthermore, the male of *T. (A.) gutierrezii* has spermatodactyl slender distally.

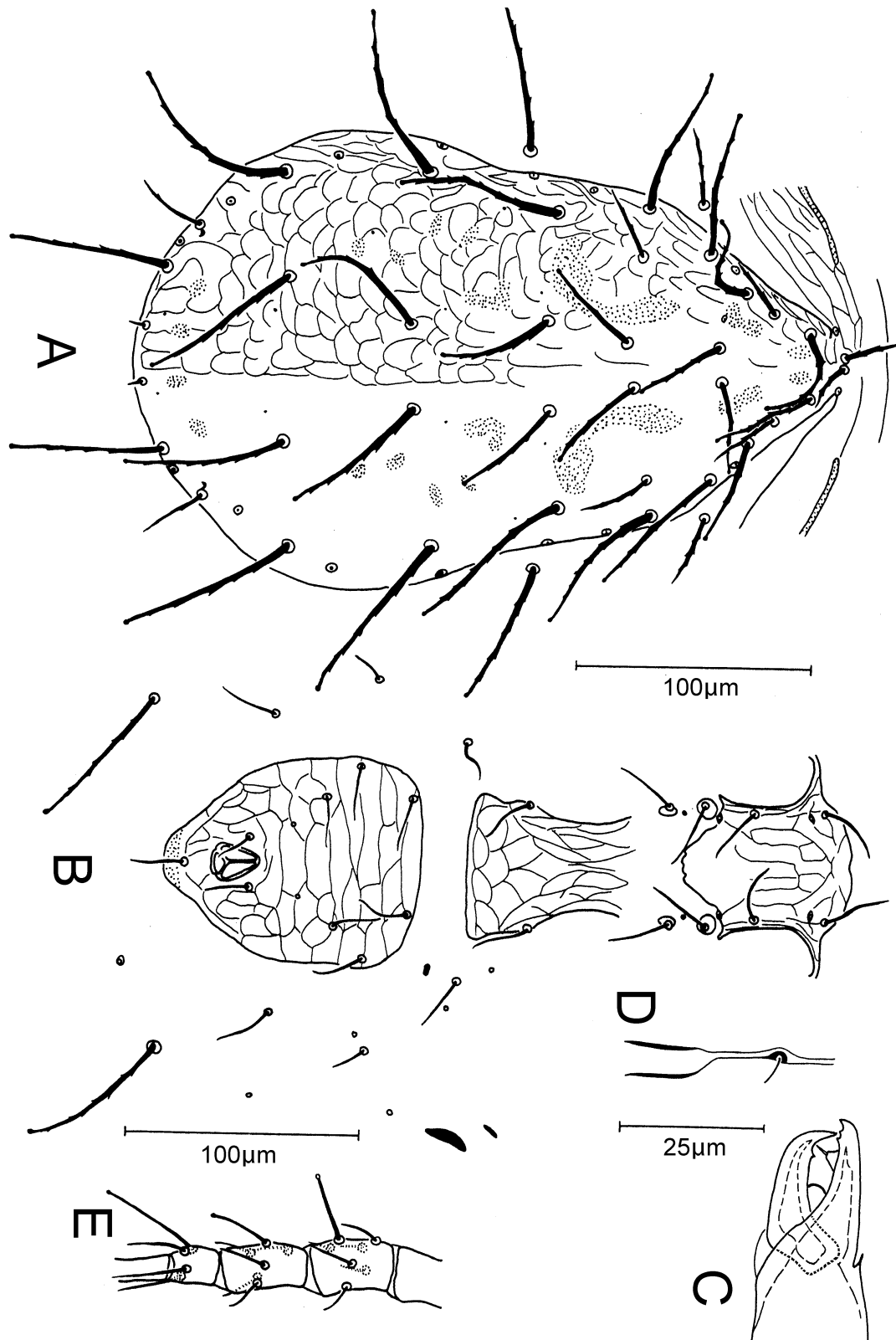
***Typhlodromus (Anthoseius) neohartlandrowei* Zannou, Moraes & Oliveira, n. sp.**  
(Fig. 37)

**Diagnosis.** This species is characterized by having anterior part of proscutum narrow; most of the dorsal setae knobbed, longer than distances between their bases and the bases of consecutive setae, seta r3 and R1 on integument; sternal, genital and ventrianal shields reticulate; sternal shield with 2 pairs of setae (ST3 on separate shields); distal two-thirds of calyx of spermatheca bell-shaped and rest slender.

FEMALE. (2 specimens measured). Idiosomal setal pattern 12A:8A/JV-3:ZV.

Dorsum. Dorsal shield 291 (290–291) long and 163 wide, reticulate. With 5 pairs of solenostomes, not all indicated in fig 37. Setae j1 24, j3 45 (45–46), j4 40 (39–42), j5 47 (44–50), j6 55 (53–58), J2 59 (58–61), J5 9 (8–10), z2 28 (27–29), z3 42, z4 57 (56–58), z5 35 (31–38), Z4 68 (67–68), Z5 68 (67–68), s4 62 (61–62), s6

73 (72–74), S2 76 (76–77), S4 75, S5 29 (29–30), r3 36 (34–38), R1 64. Most setae serrate and knobbed; setae j1, z2, z5, S5 and r3 knobbed, sharp-tipped, and seta J5 smooth and sharp-tipped. Most setae longer than distance between their bases and the bases of consecutive setae.



**FIGURE 37.** *Typhlodromus (Anthoseius) neohartlandrowei* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

Peritreme. Extending to level of j3.

Venter. Sternal shield reticulate, with 2 pairs of setae (ST3 on separate shields); posterior margin with a quadri-dentate median projection; distances between ST1–ST3 50, ST2–ST2 49. Genital shield reticulate; distance between ST5–ST5 53. Ventrianal shield reticulate, subtriangular, with anterior margin slightly convex, 102 (96–107) long, 91 (90–91) wide at level of ZV2, with 3 pairs of pre-anal setae (seta JV3 absent); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate and knobbed.

Chelicera. Movable digit 26 long, with 1 tooth; fixed digit 26 long, with 2 teeth.

Spermatheca. Sixty percent of calyx adjacent to vesicle bell-shaped rest slender, 18 (10–27) long; atrium nodular.

Legs. Macrosetae knobbed: Sge IV 29, Sti IV 25 (22–27), St IV 43. Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female from *Elaeis guineensis*, 27 km SW Ngoulemakong, Cameroon, 6-II-1991, L. Louis; 1 paratype female from *E. guineensis*, 12 km W Angale, Cameroon, 7-II-1991, L. Louis; both types deposited at ESALQ-USP.

**Etymology.** The name *neohartlandrowei* refers to the similarity between this species and *T. (A.) hartlandrowei*.

**Remarks.** *Typhlodromus (A.) hartlandrowei* and *T. (A.) transvaalensis* (Nesbitt, 1951) differ from this new species by having the anterior part of the proscutum broad, and sternal and genital shields smooth. In addition, the former species has r3 on dorsal shield and macrosetae present on genu and tibia of leg III, while the latter has most of the dorsal setae shorter than distance between their bases and the bases of setae next behind, ventrianal shield pentagonal and striate, and 8 setae on genu of leg II.

### *Typhlodromus (Anthoseius) neomichaeli* Zannou, Moraes & Oliveira, n. sp.

(Fig. 38)

**Diagnosis.** Characterized by having all the dorsal setae serrate, except J5, smooth; sternal shield with 2 pairs of setae (ST3 on integument) and posterior margin partially indistinct with a trapezoidal median projection; Ventrianal shield subquadrate; calyx of spermatheca swollen proximally, bladder-like, then narrows and flares distally, 3 times as long as wide; atrium nodular, small.

FEMALE. (2 specimens measured). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield, 328 (320–337) long and 200 (197–203) wide, reticulate. With 5 pairs of solenostomes. Setae j1 20 (18–23), j3 27 (26–27), j4 24, j5 24, j6 27 (27–28), J2 31 (31–32), J5 14 (13–15), z2 20, z3 25 (25–26), z4 27 (27–28), z5 25 (25–26), Z4 38 (38–39), Z5 42 (41–43), s4 28 (28–29), s6 32 (31–33), S2 36 (35–37), S4 39 (37–40), S5 30 (28–31), r3 23, R1 30. Setae serrate, except J5, smooth; and Z5, knobbed. Setae J2, Z4, Z5, s6, S2, S4 and S5 on small tubercles.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin partially indistinct, with a trapezoidal median projection; distances between ST1–ST3 64 (63–66), ST2–ST2 61 (61–62). Genital shield smooth; distance between St5–St5 68 (67–68). Ventrianal shield smooth, subquadrate, with anterior margin almost straight, 121 (118–125) long, 99 (98–100) wide at level of ZV2, 93 wide at level of anus, with 4 pairs of pre-anal setae (JV3 present); round pre-anal pores posterior to and slightly mesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate.

Chelicera. Movable digit 26 long, with 2 teeth; fixed digit 24 long, with 3 to 4 teeth.

Spermatheca. Calyx short, slightly bulged adjacent to atrium, then narrows and flares towards vesicle, 15 long; atrium small and nodular.

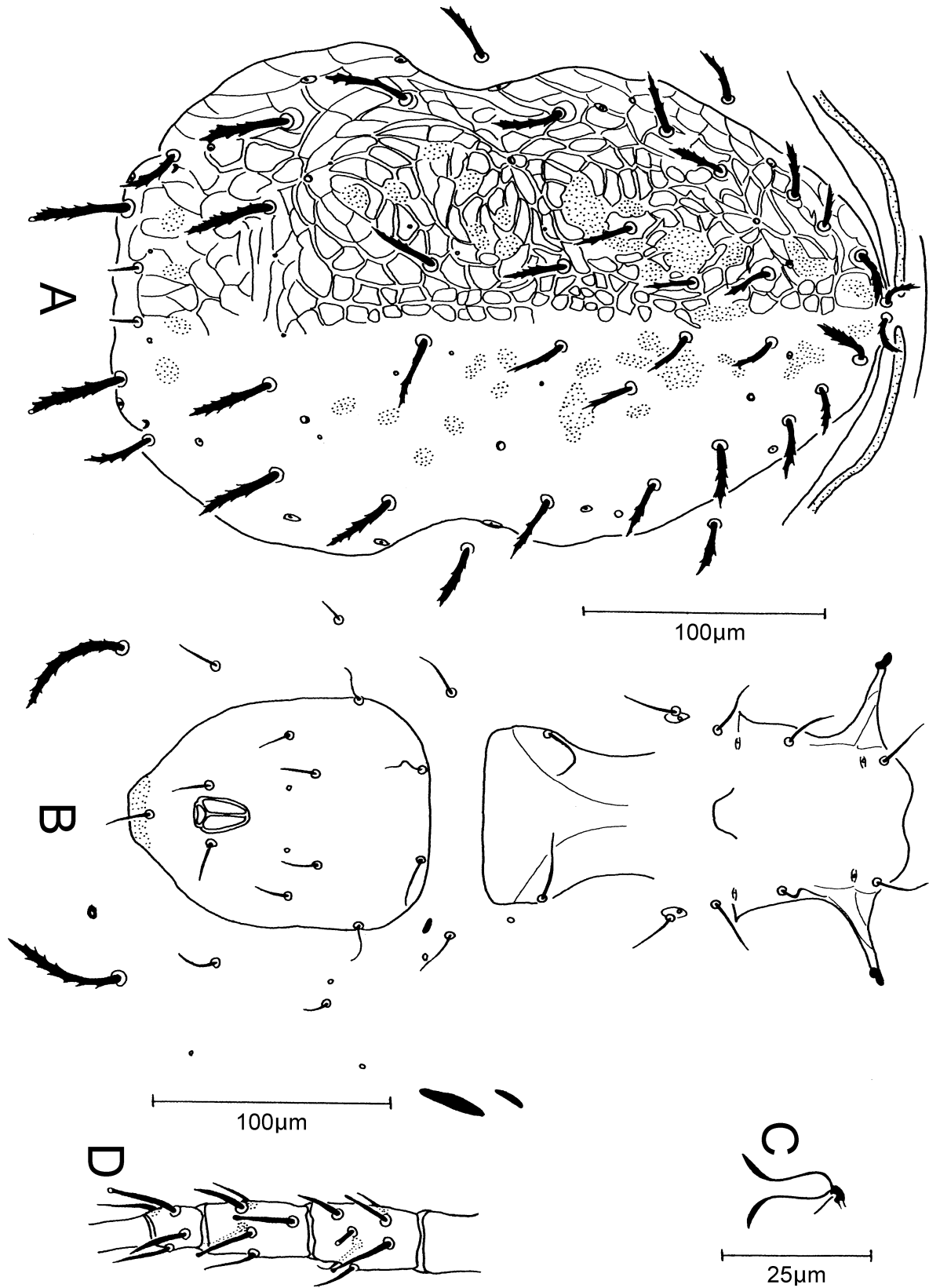


FIGURE 38. *Typhlodromus (Anthoseius) neomichaeli* Zannou, Moraes & Oliveira, n. sp. (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

Legs. Macrosetae knobbed: Sge 23 (18–28), St IV 30 (29–31). Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype and 1 paratype females from *Ficus brachypoda*, 5 km S Kashiba, Zambia, 13-VI-1992, J.S. Yaninek, deposited at ESALQ-USP.

**Etymology.** The name *neomichaeli* refers to the similarity between this species and *T. (A.) michaeli*.

**Remarks.** *Typhlodromus (A.) combretum* and *T. (A.) michaeli* differ from this new species by having calyx of spermatheca 1.3 times as long as wide. The calyx of spermatheca is saccular in the former and bell-shaped in the latter. Furthermore, dorsal shield setae of *T. (A.) combretum* are slightly serrate and *T. (A.) michaeli* has sternal shield with 3 pairs of setae. *Typhlodromus (A.) coryphus* and *T. (A.) machaon* also differ from this new species in that the calyx of spermatheca is short and bell-shaped and a long tube, respectively; pre-anal pores absent in former.

***Typhlodromus (Anthoseius) neoterrulentis* Zannou, Moraes & Oliveira, n. sp.**  
(Fig. 39)

**Diagnosis.** Characterized by having dorsal shield strongly reticulate; most of “lateral setae”, Z4, r3 and R1 serrate; dorsal setae sharp-tipped, except Z5, knobbed; sternal shield with 3 pairs of setae (ST3 on shield) and posterior margin with a median lobe; ventrianal shield striate posteriorly to ZV2; setae JV5 serrate and knobbed; calyx of spermatheca saccular over most of its length, constricted near atrium; knobbed macrosetae on genu and basitarsus of leg IV.

FEMALE. (2 specimens measured). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield 326 (325–326) long and 176 (175–178) wide, strongly reticulate. With 5 pairs of solenostomes. Setae j1 18 (16–19), j3 18 (16–19), j4 11, j5 11, j6 15 (14–15), J2 17 (16–18), J5 10 (9–11), z2 12 (11–12), z3 15 (14–16), z4 16 (14–17), z5 13, Z4 29, Z5 43 (41–45), s4 18 (16–19), s6 19, S2 21 (19–22), S4 27 (26–28), S5 27 (26–28), r3 17 (16–17), R1 17 (16–17). Setae j1, j3, Z4, Z5, s4–S5, r3 and R1 serrate; other setae smooth; setae sharp-tipped, except Z5, knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield mostly smooth, with few lateral striae and 3 pairs of setae (ST3 on shield); posterior margin with a median lobe; distances between ST1–ST3 64, St2–St2 56. Genital shield smooth; distance between ST5–ST5 51 (50–53). Ventrianal shield smooth, sometimes with some striae between ZV2 and post anal seta, pentagonal, with anterior margin almost straight, 113 (110–115) long, 99 (98–101) wide at level of ZV2, 85 (83–88) wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate and knobbed.

Chelicera. Movable digit 28 long, with 2 teeth; fixed digit 26 long, with 4 teeth.

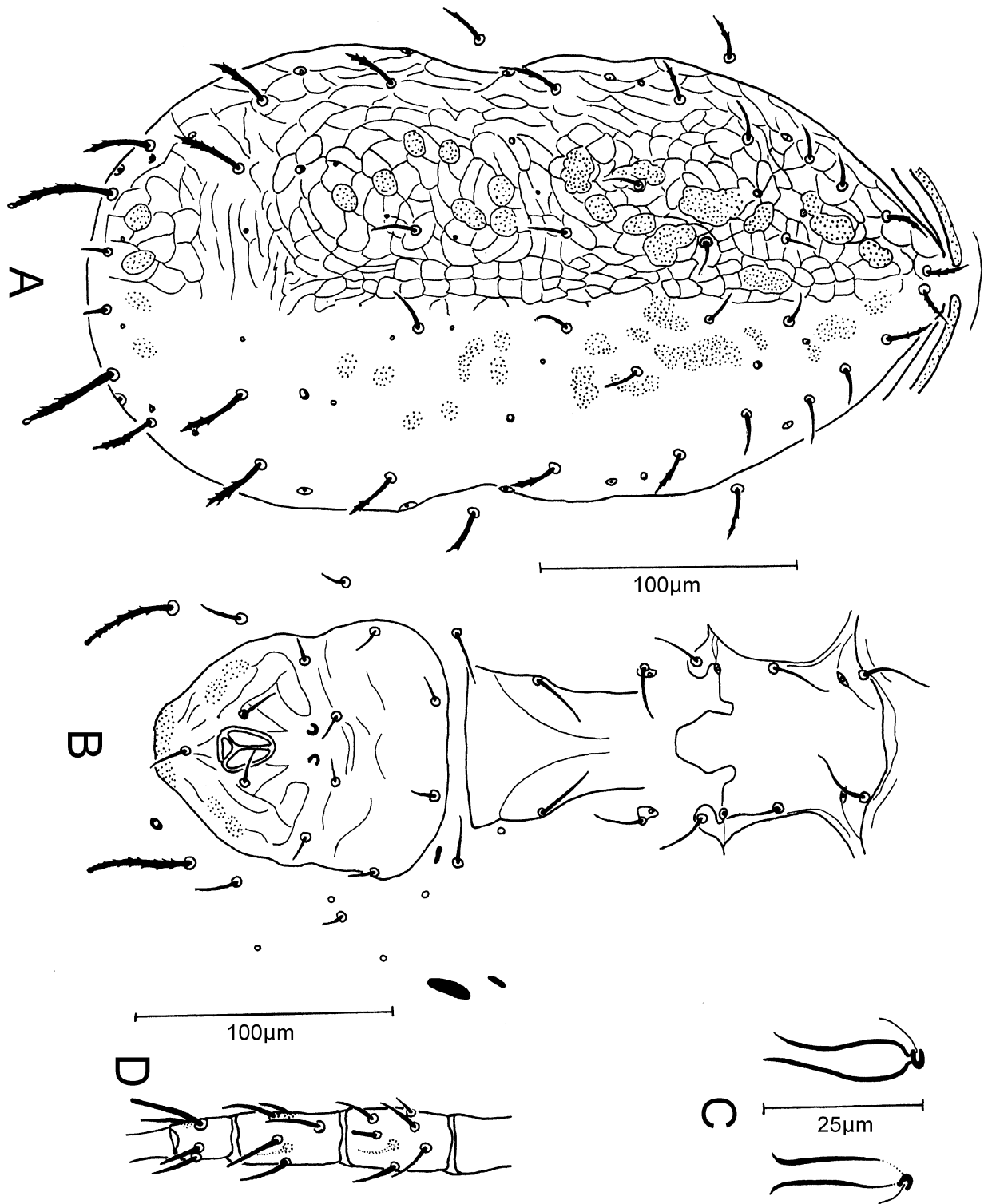
Spermatheca. Calyx saccular and thick-walled on about 2/3 of its length, constricted near atrium, 18 (17–19) long; atrium nodular.

Legs. Macrosetae knobbed: Sge IV 10 (9–10), St IV 32 (31–32). Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype and 1 paratype females from *Uapaca kirkiana*, 78 km S. Chiwoma, Zambia, 19-X-1992, A. Onzo.

**Etymology.** The name *neoterrulentis* refers to the similarity between this species and *Typhlodromus (A.) terrulentis* Van der Merwe.

**Remarks.** *Typhlodromus (A.) terrulentis* differs from this species by having setae j3, s4–S2, r3 and R1 smooth, Z4 knobbed and movable digit of chelicera toothless. *Typhlodromus (A.) grastis* also differs from the new species by having setae Z4, S4 and S5 knobbed and setae z2–z4 serrate.



**FIGURE 39.** *Typhlodromus (Anthoseius) neoterrulentis* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

***Typhlodromus (Anthoseius) paganus* Van der Merwe**  
(Fig. 40)

*Typhlodromus (Anthoseius) paganus* Van der Merwe, 1968: 46; Moraes *et al.*, 2004: 341; Chant & McMurtry, 2007: 155.



*Amblydromella pagana*, Moraes *et al.*, 1986: 169.

*Amblydromella (Aphanoseia) pagana*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 4 paratypes and 9 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 349 (325–371) [350] long and 181 (177–214) [190] wide, reticulate between j1 and Z4 and striate postero-centrally to latter. With 5 pairs of solenostomes, only gd6 not indicated in fig 40. Setae j1 21 (19–25) [19], j3 20 (17–23) [17], j4 15 (13–17) [14], j5 16 (13–19) [16], j6 19 (17–20) [17], J2 20 (18–23) [20], J5 10 (9–12) [10], z2 16 (14–18) [15], z3 18 (17–20) [17], z4 19 (16–22) [18], z5 17 (15–18) [16], Z4 31 (26–31) [26], Z5 47 (43–52) [47], s4 21 (18–23) [18], s6 23 (21–25) [22], S2 24 (21–26) [21], S4 25 (23–28) [24], S5 15 (13–17) [15], r3 19 (17–20) [18], R1 18 (16–20) [18]. Setae smooth and sharp-tipped, except Z4, serrate, and Z5, serrate and knobbed.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin with a median lobe; distances between ST1–ST3 60 (55–65) [58], ST2–ST2 56 (52–60) [56]. Genital shield smooth; distance between ST5–ST5 61 (59–64) [59]. Ventrianal shield smooth, pentagonal, with anterior margin almost straight, 116 (110–122) [114] long, 94 (84–102) [92] wide at level of ZV2, 80 (72–89) [75] wide at level of anus; round pre-anal pores posteromesad of JV2. With 2 pairs metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

Peritreme. Extending to level of j1.

Chelicera. Movable digit 27 (26–27) [26] long, with 2 teeth (in some specimens, a minute third tooth seems present); fixed digit 25 (23–27) [24] long, with 4 – 5 teeth.

Spermatheca. Calyx tubular, 16 (13–21) [18] long; atrium small.

Legs. Macroseta slightly knobbed; St IV 29 (26–33) [30]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 2)

Dorsum. Dorsal shield pattern and setae as in female, 274 (271–276) long and 169 (161–176) wide. Setae j1 15 (13–17), j3 19 (18–19), j4 13 (12–13), j5 14 (13–14), j6 12 (11–13), J2 15, J5 9 (8–9), z2 14 (13–14), z3 14, z4 15 (14–15), z5 13 (12–14), Z4 21 (20–21), Z5 36 (33–39), s4 17 (16–18), s6 17, S2 18 (16–19), S4 18 (16–20), S5 12 (10–13), r3 17 (15–18), R1 13 (12–13).

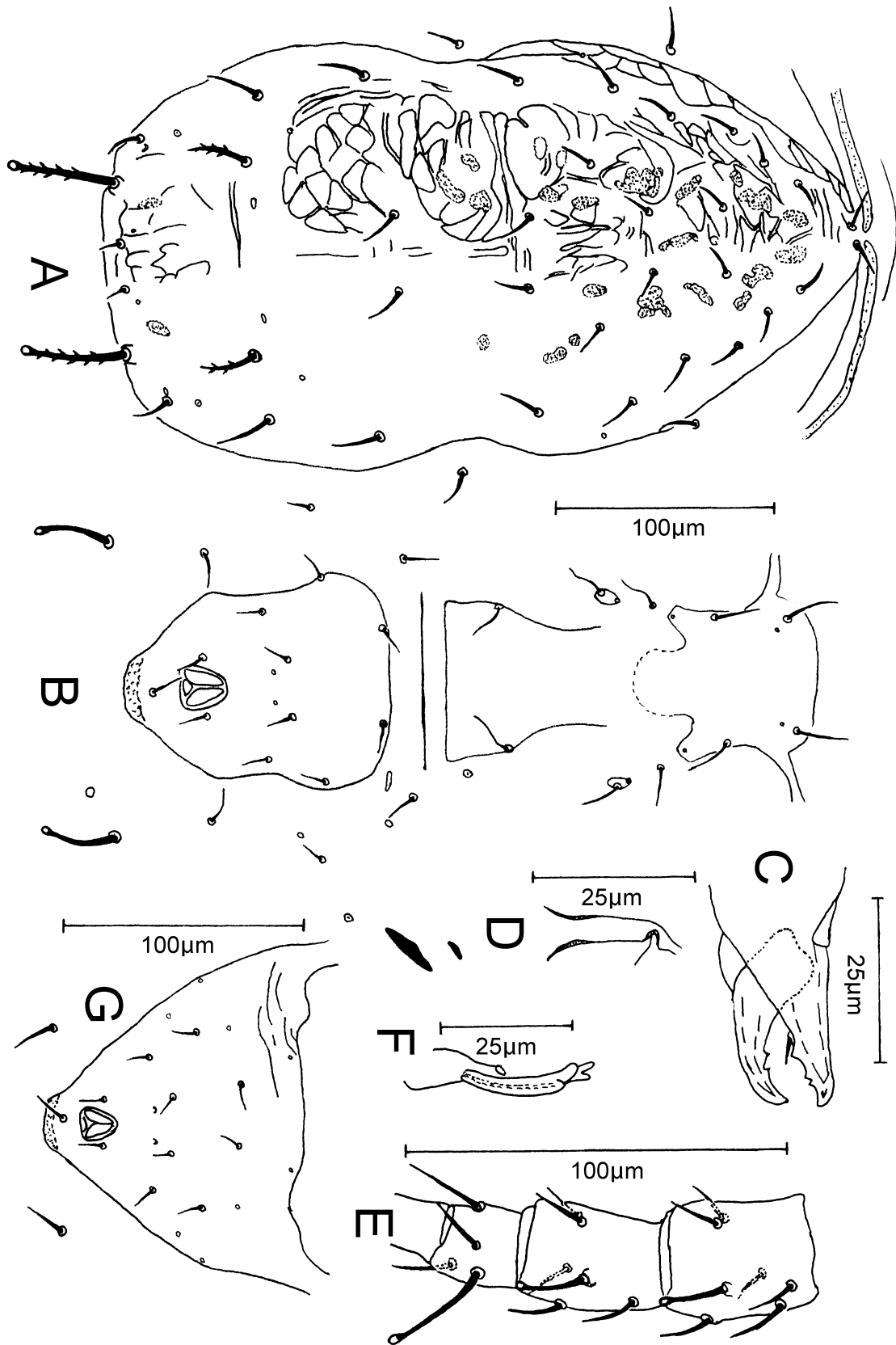
Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, mostly smooth, with few striae anteriorly to JV1, fused with peritrematal shields, 109 (101–116) long, 144 wide at anterior corners; with 4 pairs of pre-anal setae and 4 distinguishable pairs of lyrifissures (1 anterior to JV1, 1 sublaterad and almost transversally aligned with JV1, 1 laterad and transversally aligned with ZV2, 1 laterad and well posterior to ZV2); elliptical pre-anal pores posteromesad of JV2 caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Straight, forked distally, shaft 25 (24–25) long.

Legs. Macrosetae knobbed; Sge IV 15 (13–16), Sti IV 17 (16–18), St IV 26 (24–27). Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female and 1 paratype female, Eastern Cape Province, Fort Beaufort, on *Acacia karroo*, 15-I-1965, M.K.P. Smith Meyer; 1 paratype female, Eastern Cape Province, Mount Zebra National Park, on *Diospyros lycioides*, 28-I-1965, G.G. van der Merwe; 1 paratype female, Eastern Cape Province, Mount Zebra National Park, on *Rhus erosa*, 29-I-1965, G.G. van der Merwe; 1 paratype female, Eastern Cape Province, Mount Zebra National Park, on *Prunus armeniaca*, 28-I-1965, G.G. van der Merwe; 1 female, Eastern Cape Province, Addo Elephant National Park, on *Grewia robusta*, 8-III-1986, E.A. Ueckermann; 1 female, Eastern Cape Province, Addo Elephant National Park, on *Azima tetracantha*, 7-III-1986, M.K.P. Smith Meyer; 1 female Eastern Cape Province, Mount Zebra National Park, on *Lycium oxycarpum*, 4-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Mount Zebra National Park, on



**FIGURE 40.** *Typhlodromus (Anthoseius) paganus* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

*Melianthus* sp., 6-III-1986, E.A. Ueckermann; 1 female, Eastern Cape Province, Mount Zebra National Park, on *Diospyros lycioides*, 6-III-1986, M.K.P. Smith Meyer; 1 female and 1 male, Eastern Cape Province, Mount Zebra National Park, on *Rhus lancea*, 4-III-1986, M.K.P. Smith Meyer; 1 male Eastern Cape Province, Mount Zebra National Park, on *Garuleum pinnatifidum*, 4-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Zuurberg Pass, on *Zanthoxylum capense*, 7-III-1986, E.A. Ueckermann; 1 female, Western Cape Province, Cape Point Nature Reserve, on *Metalasia brevifolia*, 23-X-1980, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, 40 km from Peddie to East London, on *Rhus undulata*, 12-II-1974, C. J. Colijn.

**World distribution.** South Africa.

### ***Typhlodromus (Anthoseius) persianus* McMurtry**

(Fig. 41)

*Typhlodromus persianus* McMurtry, 1977: 563.

*Amblydromella persiana*, Moraes *et al.*, 1986: 169.

*Typhlodromus (Anthoseius) persianus*; Ueckermann & Loots, 1988: 54; Moraes *et al.*, 2004: 341; Chant & McMurtry, 2007: 155.

*Amblydromella (Aphanoseia) persianus*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—Yemen: 1. Cape Verde: 4). Idiosomal setal pattern 12A:8A/JV: ZV.

Dorsum. Dorsal shield 320 (306–339) long and 186 (173–201) wide, reticulate. With 5 pairs of solenostomes, not all indicated in fig. 41A. Setae j1 22 (21–24), j3 27 (24–34), j4 19 (18–20), j5 22 (21–23), j6 25 (22–28), J2 29 (25–32), J5 11, z2 21 (17–25), z3 25 (24–26), z4 27 (26–29), z5 22 (21–24), Z4 41 (37–50), Z5 48 (43–51), s4 30 (27–32), s6 32 (29–37), S2 36 (33–42), S4 35 (33–39), S5 25 (20–31), r3 28 (27–31), R1 29 (27–33). Setae smooth and sharp-tipped, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending almost to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin apparently with a trapezoidal median projection; distances between ST1–ST3 61 (59–67), ST2–ST2 50 (48–52). Genital shield smooth; distance between ST5–ST5 64 (58–69) [61]. Ventrianal shield smooth, pentagonal, with anterior margin slightly convex, 106 (102–111) long, 75 (72–79) wide at level of ZV2, 67 (64–71) wide at level of anus; elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 25 (25–27) long, with 2 teeth; fixed digit 22 (21–23) long, with 4 teeth.

Spermatheca. Calyx a broad tube, 12 (10–14) long.

Legs. Macroseta knobbed; St IV 24 (20–33). Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—Cape Verde: 2)

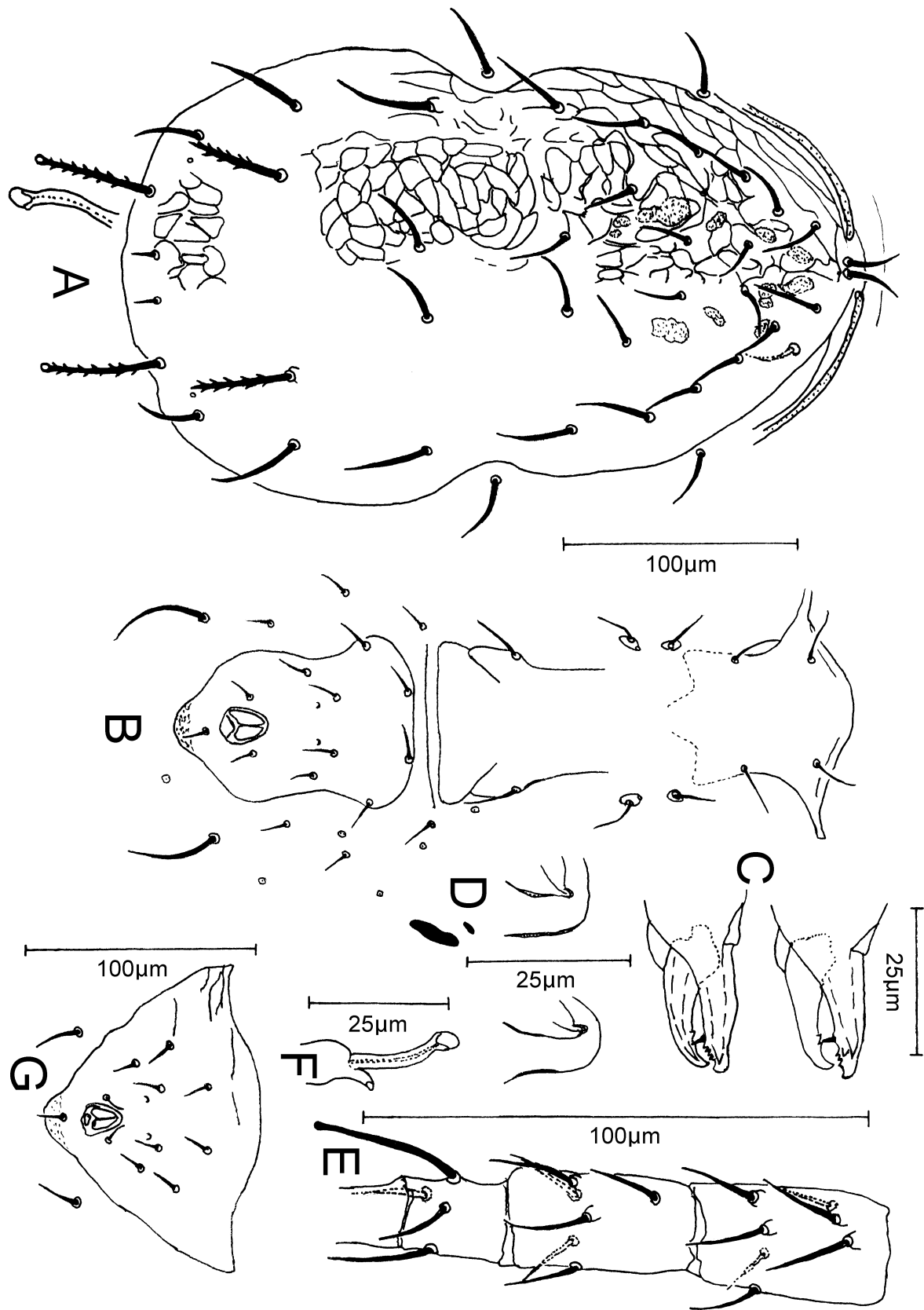
Dorsum. Dorsal shield pattern and setae as in female, 242 (232–251) long and 160 (151–167) wide. Setae j1 17, j3 19 (17–20), j4 16 (15–17), j5 16 (15–17), j6 19, J2 21 (19–22), J5 9 (8–9), z2 18 (16–19), z3 20 (19–21), z4 19 (18–19), z5 14 (13–15), Z4 27, Z5 31 (29–32), s4 24 (22–25), s6 24, S2 26 (25–27), S4 20 (18–21), S5 14 (13–15), r3 19 (18–20), R1 19 (18–20).

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, mostly smooth with few striae anteriorly to ZV2, free from peritrematal shields, 95 (92–98) long, 131 (128–134) wide at anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures; minute elliptical pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Shaft straight, 20 (18–21) long.

Legs. Macrosetae knobbed; Sge IV 13 (11–14), St IV 24 (21–26). Chaetotaxy of genera II and III as in female.



**FIGURE 41.** *Typhlodromus (Anthoseius) persianus* McMurtry: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

**Specimens examined. Yemen:** 1 female, on an unidentified plant, XIII-1991, A. van Harten. **Cape Verde:** 1 female, Sao Jorge, on *Vitis vinifera*, 24-VIII-1983, A. van Harten; 2 females and 1 male, Sao Jorge, on an unidentified plant, 30-VIII-1983, A. van Harten; 1 female and 1 male, Sao Jorge, on *Asteriscus vogelii*, 26-VIII-1983, A. van Harten; **South Africa:** 1 paratype female, Kwazulu/Natal, 25 km from Jozini to Ingwavuma, on *Maytenus senegalensis*, 19-IX-1972, F.W. Schultz; 1 paratype female Eastern Cape Province, 15 km from East London to Umtata, on *Sida rhombifolia*, 9-II-1974, F.W. Schultz; 1 female, Mpumalanga Province, 21 km from Nelspruit to Kaapmuiden, on *Lantana camara*, 6-II-1985, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Aliwal North, on *Ulmus parvifolia*, 12-III-1986, E.A. Ueckermann; 1 female, Mpumalanga Province, Crocodile Bridge, Kruger National Park, on unidentified plant, 5-II-1985, E.A. Ueckermann.

**World distribution.** Cape Verde, Iran, South Africa and Yemen.

### *Typhlodromus (Anthoseius) praeacutus* Van der Merwe

(Fig. 42)

*Typhlodromus (Anthoseius) praeacutus* Van der Merwe, 1968: 53; Moraes *et al.*, 2004: 343; Chant & McMurtry, 2007: 155.

*Amblydromella praeacuta*, Moraes *et al.*, 1986: 170.

*Typhlodromus praeacutus*, Ueckermann, 1992: 147.

*Amblydromella (Aphanoseia) praeacuta*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 4 paratypes and 8 other specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 321 (283–339) [328] long and 165 (153–177) [161] wide, reticulate between j1 and anterior to Z4 and smooth posteriorly to latter. With 5 pairs of solenostomes, only gd4 not indicated in fig. 42A. Setae j1 22 (19–25) [19], j3 30 (26–35) [32], j4 19 (14–22) [23], j5 19 (15–22) [22], j6 28 (23–30) [29], J2 35 (28–38) [35], J5 10 (8–12) [11], z2 21 (16–24) [21], z3 29 (26–33) [31], z4 31 (28–34) [34], z5 21 (18–25) [24], Z4 56 (47–62) [60], Z5 63 (55–71) [66], s4 37 (30–46) [43], s6 41 (33–45) [45], S2 47 (42–56) [56], S4 46 (35–52) [44], S5 18 (13–21) [17], r3 27 (24–30) [30], R1 28 (22–30) [26]. Setae smooth and sharp-tipped, except Z4 and Z5, serrate. Setae r3 and R1 inserted on integument in most specimens; both r3 and one of members of R1 inserted on integument, other member of R1 on dorsal shield in few specimens.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a median lobe; distances between ST1–ST3 59 (54–62) [62], ST2–ST2 50 (46–54). Genital shield smooth; distance between ST5–ST5 53 (48–59) [52]. Ventrianal shield smooth, pentagonal, with anterior margin straight, 109 (99–115) [104] long, 70 (65–75) [72] wide at level of ZV2, 64 (61–74) [61] wide at level of anus; round pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

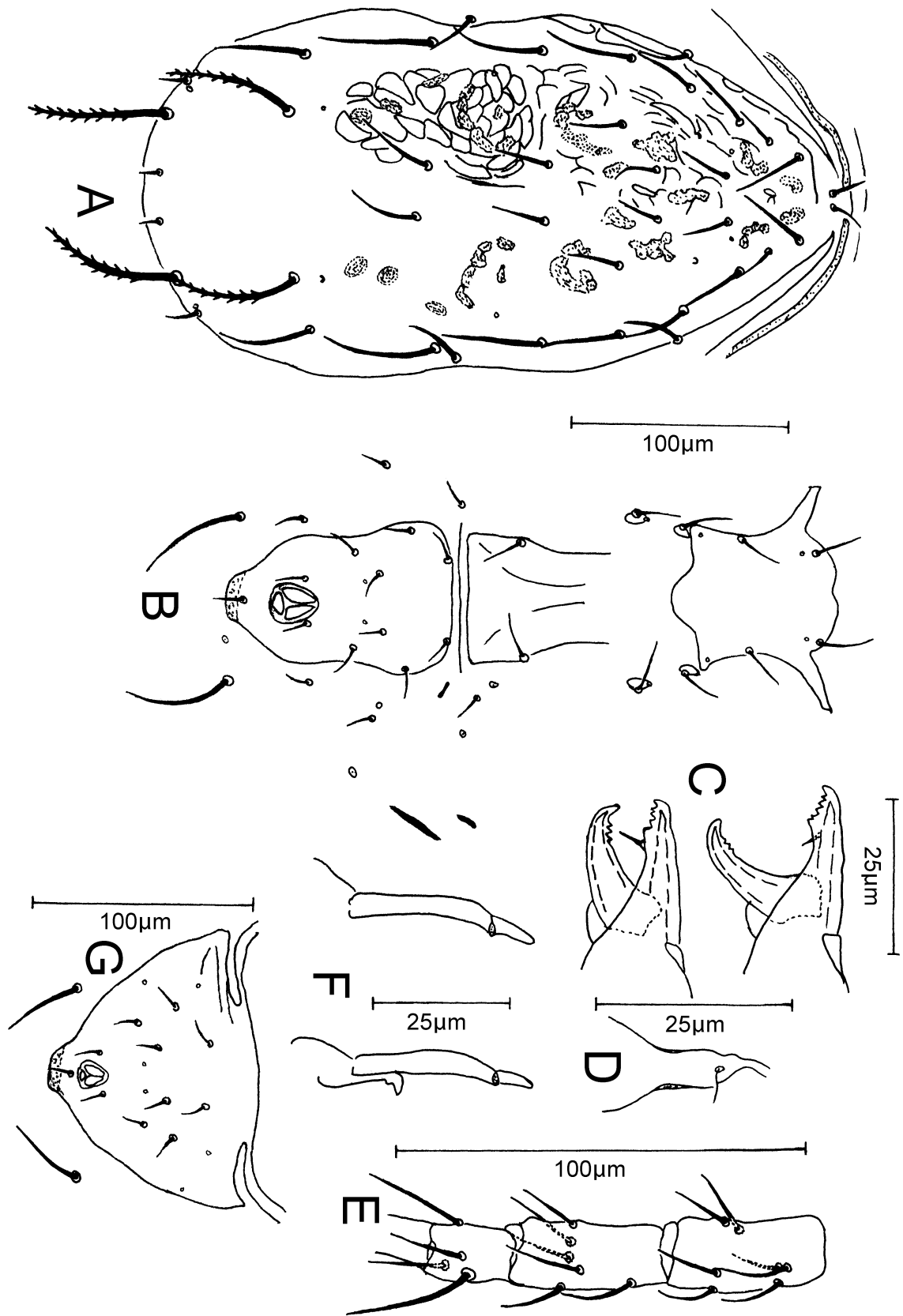
Chelicera. Movable digit 23 (21–25) [23] long, with 3 teeth [, third tooth minute in some specimens, sometimes seemingly absent, in some specimens]; fixed digit 23 (19–28) [23] long, with 4 – 5 teeth.

Spermatheca. Calyx elongate, bell-shaped, 15 (11–18) [14] long; atrium small, incorporated in calyx.

Legs. Macroseta sharp-tipped; St IV 29 (21–34) [33]. Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 3)

Dorsum. Dorsal shield pattern and setae as in female, 263 (247–294) long and 139 (132–146) wide. Setae j1 17 (16–18), j3 22 (20–24), j4 17 (16–17), j5 15 (13–16), j6 20 (18–22), J2 15, J5 21 (20–23), z2 17 (15–20), z3 22 (21–23), z4 23 (22–25), z5 17 (16–19), Z4 37 (37–38), Z5 38 (36–41), s4 28 (26–29), s6 28 (25–30), S2 30 (28–31), S4 22 (17–24), S5 13 (12–14), r3 20, R1 19 (18–21).



**FIGURE 42.** *Typhlodromus (Anthoseius) praeacutus* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

Peritreme. Extending to level of j1.

Venter. Ventrianal shield subtriangular, mostly smooth, with few striae anteriorly to JV1, fused with peritrematal shields, 96 (92–100) long, 127 (115–135) wide at anterior corners; with 4 pairs of pre-anal setae and 2 distinguishable pairs of lyrifissures (1 sublateral and almost transversally aligned with JV1 and 1 laterad and posterior to ZV2); round pre-anal pores posteromesad of JV2. Caudovervental setae smooth and sharp-tipped.

Spermatodactyl. Shaft straight, 34 (31–35) long.

Legs. Macroseta sharp-tipped; St IV 25 (24–26). Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female and 1 paratype female, Gauteng, Witbank, on *Prunus* sp., 28-III-1964, G.G. van der Merwe; 1 paratype female, Gauteng, Pretoria, on unidentified plant, 9-I-1964, G.G. van der Merwe; 1 paratype female, Limpopo Province, Timbavati, Kruger National Park, on *Abutilon* sp., 26-IX-1963, M.K.P. Smith Meyer; 1 paratype female, Mpumalanga Province, Crocodile River, Kruger National Park, on *Nuxia congesta*, 4-X-1963, M.K.P. Smith Meyer; 1 female and 1 male, Gauteng, Pretoria, on *Aloe* cf. *davyana*, 10-II-1985, S. Naser; 1 female, Free State Province, Gariep Dam, on *Acacia mellifera*, 3-III-1986, E.A. Ueckermann; 1 female Mpumalanga Province, 3 km from Swaziland border, on *Lonchocarpus capassa*, 5-II-1985, E.A. Ueckermann; 1 male, Gauteng, Pretoria, on *Peltophorum africanum*, 24-III-1986, S. Naser; 1 female and 1 male, Gauteng, Brummeria, Pretoria, on *Clerodendrum glabrum*, 21-II-1985, S. Naser; 1 female, Eastern Cape Province, 10 km from Lady Grey to Bossieslaagte, on *Diospyros austro-africana*, 12-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, 5 km from Aliwal North to Lady Grey, on *Rhus undulate*, 12-III-1986, E.A. Ueckermann; 1 female, Eastern Cape Province, Mount Zebra National Park, on *Melianthus* sp., 6-III-1986, E.A. Ueckermann; 1 female, Northern Cape Province, Hotazel, on *Tarchonanthus camphoratus*, 2-II-1987, M.K.P. Smith Meyer.

**Remarks.** According to the original description of this species, the dorsal shield of the female is completely reticulate; the median projection of the posterior margin of its sternal shield is bi-dentate, and seta Z5, in few specimens, is slightly knobbed. In addition, the movable and fixed cheliceral digits bear 2 and 3 teeth, respectively.

**World distribution.** Cape Verde, Lesotho, South Africa, Yemen and Zimbabwe.

### *Typhlodromus (Anthoseius) rasilis* Van der Merwe (Fig. 43)

*Typhlodromus (Anthoseius) rasilis* Van der Merwe, 1968: 58; Moraes *et al.*, 2004: 344; Chant & McMurtry, 2007: 155.

*Amblydromella rasilis*, Moraes *et al.*, 1986: 171.

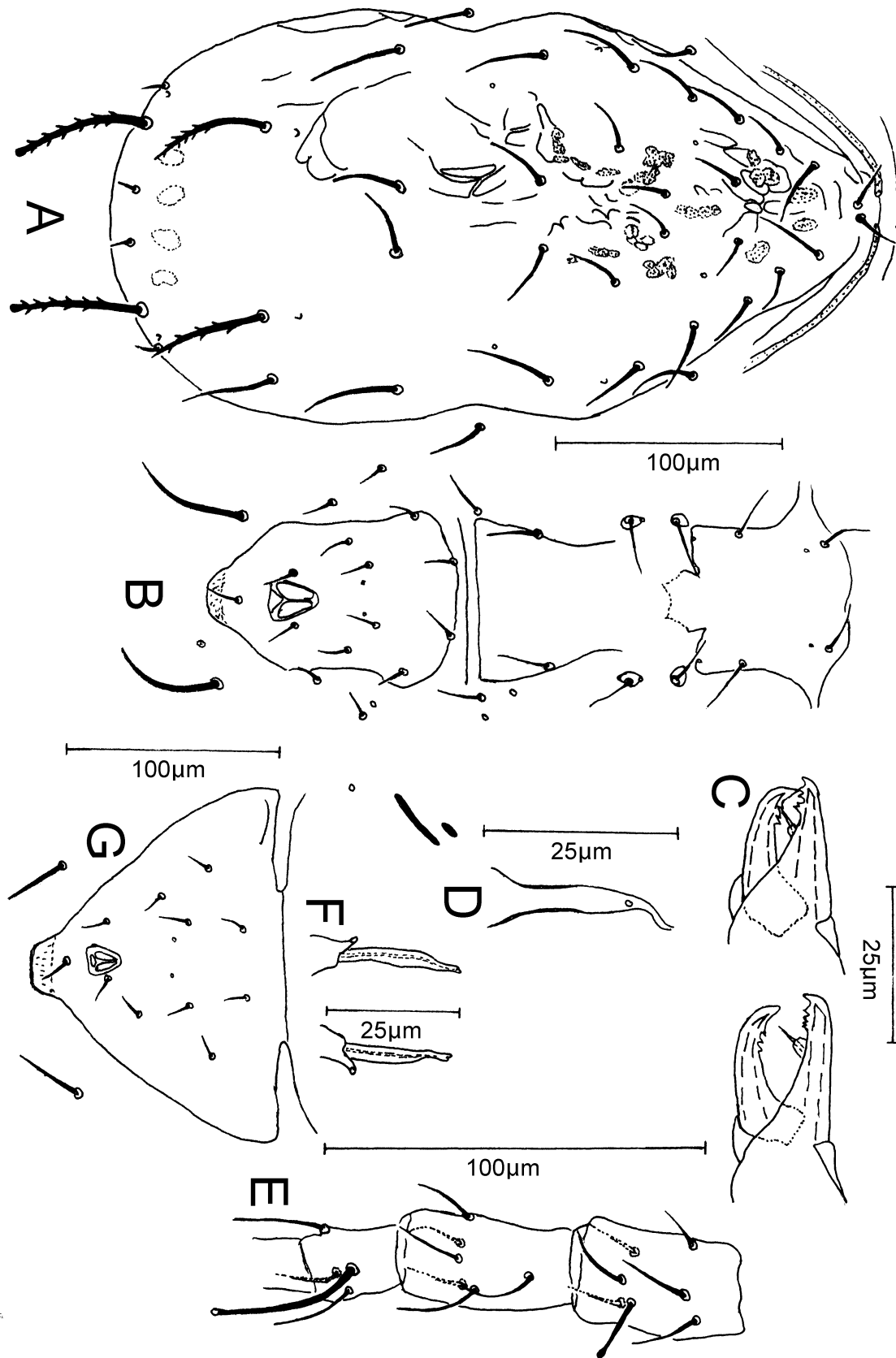
*Amblydromella (Aphanoseia) rasilis*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 3 paratype and 3 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 337 (320–354) [354] long and 178 (171–188) [188] wide, lightly reticulate. With 5 pairs of solenostomes. Setae j1 23 (21–26) [26], j3 30 (28–33) [33], j4 21 (18–23) [23], j5 21 (20–21) [21], j6 29 (27–30) [29], J2 32 (30–34) [31], J5 11 (10–13) [11], z2 19 (18–20) [22], z3 26 (24–28) [28], z4 31 (29–39) [32], z5 22 (20–25) [23], Z4 53 (51–54) [54], Z5 58 (56–61) [59], s4 35 (33–37) [36], s6 38 (37–40) [39], S2 43 (38–46) [46], S4 42 (39–44) [43], S5 12 (10–13) [10], r3 27 (24–30) [30], R1 28 (26–30) [30]. Setae smooth, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a bi-dentate median projection; distances between ST1–ST3 63 (61–67) [67], ST2–ST2 58 (56–60) [56]. Genital shield smooth; distance between ST5–ST5 58 (56–61) [58]. Ventrianal shield smooth, pentagonal, with



**FIGURE 43.** *Typhlodromus (Anthoseius) rasilis* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.



anterior margin convex, 114 (107–118) [118] long, 78 (73–85) [82] wide at level of ZV2, 66 (61–72) [72] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 25 (24–26) [26] long, with 3 teeth; fixed digit 25 (24–26) [24] long, with 4 teeth.

Spermatheca. Calyx tubular, 17 (16–18) [18] long; atrium small, incorporated in calyx.

Legs. Macrosetae knobbed; Sge IV 18 (16–23) [18], St IV 35 (32–39) [39]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 1)

Dorsum. Dorsal shield pattern and setae as in female, 272 long and 168 wide. Setae j1 19, j3 23, j4 15, j5 17, j6 21, J2 22, J5 9, z2 16, z3 20, z4 23, z5 16, Z4 35, Z5 38, s4 27, s6 28, S2 30, S4 26, S5 13, r3 22, R1 20.

Peritreme. Extending almost to level of j1.

Venter. Ventrianal shield subtriangular, mostly smooth, with few striae anteriorly to JV1, fused with peritrematal shields, 119 long, 149 wide at anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures; round pre-anal pores posterior to JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Shaft straight, 23 long.

Legs. Macrosetae knobbed; Sge 14, St IV 26. Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female and 3 paratype females, Limpopo Province, Zebediela, on *Citrus* sp., 2-IV-1962, J. den Heyer; 1 female, Limpopo Province, Mokopane, on *Acacia nilotica*, 27-II-1997, M. van der Merwe; 1 female, Limpopo Province, Zebediela, on *Euphorbia* sp, 4-III-1985, E.A. Ueckermann; 1 female and 1 male, Mpumalanga Province, Modimole, on *Terminalia sericea*, 24-5-1983, E.A. Ueckermann.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) religiosus* Ueckermann & Loots

(Fig. 44)

*Typhlodromus (Anthoseius) religiosus* Ueckermann & Loots, 1988: 41; Moraes *et al.*, 2004: 345; Chant & McMurtry, 2007: 155.

*Amblydromella (Amblydromella) religiosa*, Denmark & Welbourn, 2002: 307.

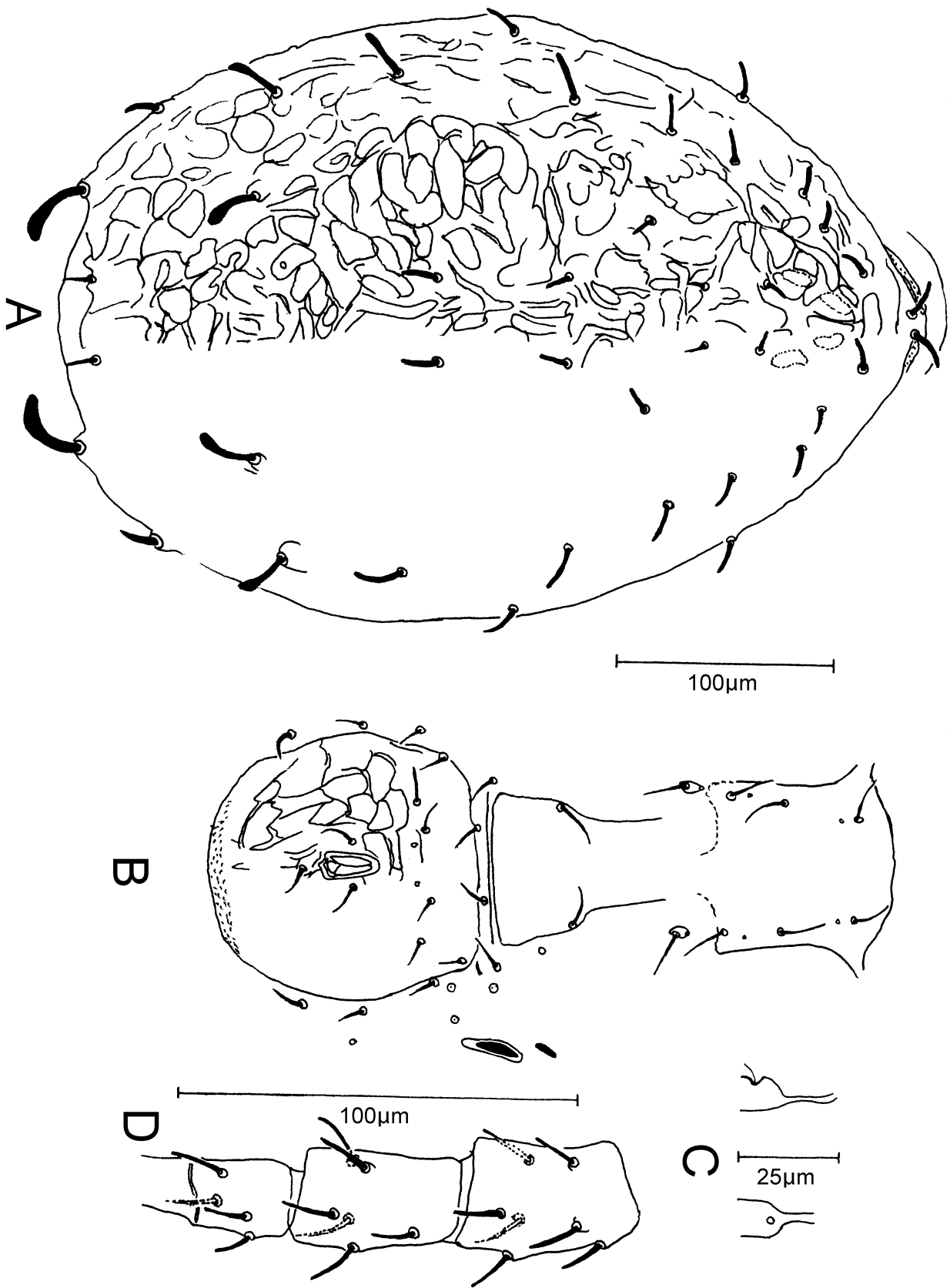
FEMALE. (Specimens measured—South Africa: holotype and 2 paratypes). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 397 (391–401) [391] long and 278 (267–289) [267] wide; reticulate, broadly oval. With 5 pairs of solenostomes. Setae j1 18 (17–19) [17], j3 16 (14–18) [18], j4 10 (10–11) [10], j5 11 (10–12) [12], j6 13 (12–14) [12], J2 18 (16–19) [16], J5 12 (12–13) [12], z2 13 (12–14) [12], z3 16 (14–18) [14], z4 18 (15–19) [15], z5 12 (12–13) [12], Z4 28 (26–29) [26], Z5 33 (32–34) [34], s4 18 (14–20) [14], s6 23 (20–26) [20], S2 25 (22–27) [22], S4 26 (24–28) [24], S5 17 (16–18) [16], r3 17 (17–18) [17], R1 14 (13–15) [13]. Setae smooth, stout and blunt; except Z4 and Z5, spatulate; S4 blunt or spatulate.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a median lobe (posterior margin became faint since original description); distances between ST1–ST3 57 (54–59) [54], ST2–ST2 56 (54–59) [54]. Genital shield smooth; distance between ST5–ST5 70 (67–76) [67]. Ventrianal shield reticulate, quadrate, with anterior margin straight, 128 (126–129) [126] long, 100 (98–104) [98] wide at level of ZV2, 120 (116–124) [116] wide at level of anus, with 3 or 4 pairs of pre-anal setae (seta JV3 present, seta JV1 on or off shield); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 26 long; position of chelicerae renders examination impossible.



**FIGURE 44.** *Typhlodromus (Anthoseius) religiosus* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

Spermatheca. Calyx very small, bell-shaped, 7 (6–8) [8] long; atrium small, incorporated in calyx.

Legs. Without macrosetae. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female and 2 paratype females, Limpopo Province, Moria near Polokwane, on *Clerodendrum glabrum*, 8-V-1981, M.K.P. Smith Meyer.

**Remarks.** Corniculus of this species is long and slender, reaching about middle of palp genu. This species belongs to the *religiosus* species group (Chant & McMurtry, 1994), because the dorsal shield is very large, extended ventrally, with setae r3 and R1 on the shield, dorsal shield heavily sculptured, all dorsal setae short, with Z5 and/or Z4 and/or S4 with knobbed or spatulate tips.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) saevus* Van der Merwe

(Fig. 45)

*Typhlodromus (Anthoseius) saevus* Van der Merwe, 1968: 39; Moraes *et al.*, 2004: 349; Chant & McMurtry, 2007: 155.

*Amblydromella saeva*, Moraes *et al.*, 1986: 174.

*Typhlodromus saevus*, El-Banhawy, 2002: 189.

*Amblydromella (Aphanoseia) saeva*, Denmark & Welbourn, 2002: 308.

FEMALE. (Specimens measured—South Africa: holotype, 6 paratypes and 7 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 299 (292–333) [316] long and 169 (157–178) [166] wide, reticulate. With 5 pairs of solenostomes, only gd9 indicated in fig. 45A. Setae j1 19 (16–21) [16], j3 20 (19–22) [20], j4 15 (13–16) [15], j5 14 (12–18) [14], j6 17 (14–19) [17], J2 20 (16–22) [20], J5 10 (9–12) [10], z2 17 (14–20) [16], z3 20 (18–21) [20], z4 21 (19–23) [19], z5 16 (14–18) [16], Z4 26 (23–28) [26], Z5 46 (38–55) [47], s4 21 (18–23) [21], s6 24 (21–26) [23], S2 25 (23–28) [27], S4 27 (24–31) [26], S5 27 (24–30) [25], r3 22 (18–25) [24], R1 21 (19–23) [20]. One member of setae S5 accidentally omitted from fig. 45A. Setae smooth and sharp-tipped, except Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin with a wedge-shaped median projection; distances between ST1–ST3 62 (58–67) [67], ST2–ST2 47 (44–52) [45]. Genital shield smooth; distance between ST5–ST5 50 (46–55) [47]. Ventrianal shield smooth, subpentagonal, with anterior margin convex, 106 (100–113) [108] long, 82 (76–94) [77] wide at level of ZV2, 74 (65–84) [75] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 22 (20–24) [22] long, with 1 – 2 teeth; fixed digit 22 (20–23) [21] long, with 4 teeth.

Spermatheca. Calyx bell-shaped, 10 (7–12) [8] long; atrium small, incorporated in calyx.

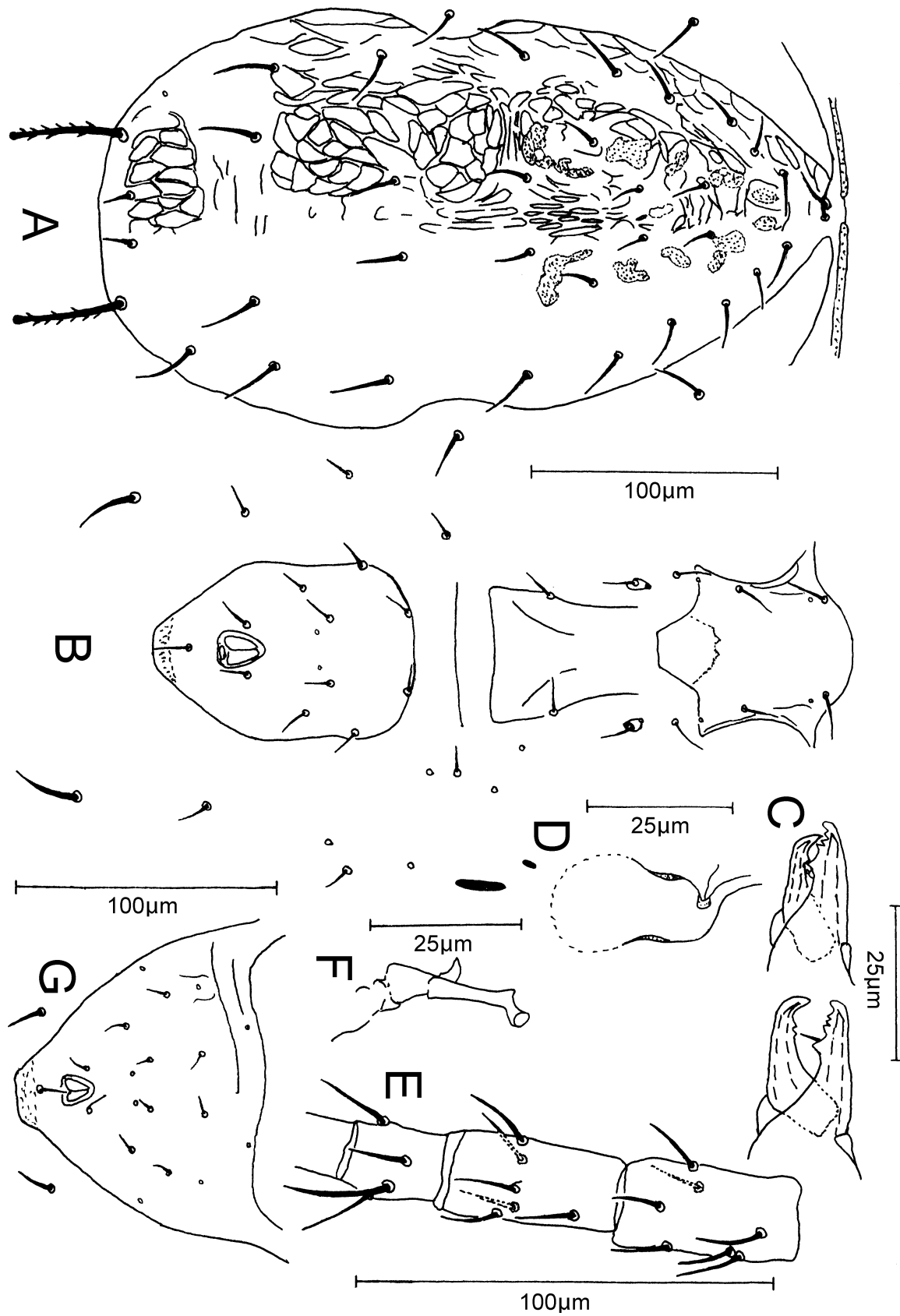
Legs. Macroseta sharp-tipped; St IV 23 (20–25) [23]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 3)

Dorsum. Dorsal shield pattern and setae as in female, 243 (242–245) long and 143 (137–147) wide. Setae j1 14 (13–14), j3 16 (14–17), j4 10 (9–11), j5 10 (9–12), j6 13 (12–14), J2 14 (12–15), J5 7 (7–11), z2 13 (11–15), z3 13 (11–15), z4 14 (11–16), z5 11 (11–12), Z4 20 (17–22), Z5 28 (27–28), s4 15 (14–17), s6 18 (15–20), S2 19 (17–20), S4 19 (18–21), S5 19 (18–22), r3 16 (14–20), R1 15 (12–18).

Peritreme. Extending almost to level of j1.

Venter. Ventrianal shield subtriangular, mostly smooth, with few striae anteriorly to ZV2, fused with peritrematal shields, 95 (93–97) long, 122 (119–125) wide at anterior corners; with 4 pairs of pre-anal setae and 3



**FIGURE 45.** *Typhlodromus (Anthoseius) saevus* Van der Merwe: Female - A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male - F. Spermatodactyl; G. Ventrianal shield.

pairs of distinguishable lyrifissures (1 anterior to JV1, 1 laterad and almost transversally aligned with JV1, 1 laterad and well posterior to ZV2); round pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Shaft straight for most of its length, bent distally 18 (16–20) long.

Legs. Macroseta sharp-tipped; St IV 17 (15–20). Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female, Western Cape Province, Caledon, on *Ficus carica*, 28-XII-1954, P.A.J. Ryke; 2 paratype females, Limpopo Province, Zebediela, on *Citrus* sp. infested with *Aonidiella auranti*, V-1964, G.G. van der Merwe; 1 paratype female, North West Province, Potchefstroom, on *Prunus domestica*, I-1964, P.A.J. Ryke; 2 paratype males, Limpopo Province, Zebediela, on *Citrus* sp., III-V-1964, J. den Heyer; 1 paratype female, Free State Province, Golden Gate National Park, on *Leucosidea sericea*, 14-X-1963, M.K.P. Smith Meyer; 1 paratype female, Western Cape Province, on *F. carica*, 2-I-1955, P.A.J. Ryke; 1 paratype female, North West Province, Potchefstroom, in debris under *P. domestica*, I-1954, P.A.J. Ryke; 1 female, Kwazulu/Natal, Monk's Cowl, Drakenberg Mountains, on *Protea dracomontana*, 16-VI-1996, S. Nesar; 1 female, Western Cape Province, Tsitsikamma National Park, on unidentified plant, 4-II-1994, E. van den Berg; 1 female, Western Cape Province, Elands Bay, on *Galenia fruticosa*, 29-IX-1982, M.K.P. Smith Meyer; 1 female, Western Cape Province, Wolfkloof, near Swellendam, on *Erica* sp., 30-12-1991, S. Nesar; 1 female, Western Cape, farm Breevlei near Grabouw, on *Malus sylvestris*, 25-IV-1991, J.H. Botha; 1 female, Western Cape Province, Langebaan, on *Lycium ferocissimum*, 19-IX-1988, E.A. Uecker-mann; 1 female and 1 male, Western Cape Province, Langebaan, on an unidentified plant, 19-IX-1988, J.C.S. Barnard.

**World distribution.** South Africa.

***Typhlodromus (Anthoseius) subtilis* Zannou, Moraes & Oliveira, n. sp.**

(Fig. 46)

**Diagnosis.** This species is characterized by having dorsal shield with lateral striae, light reticulations between j6 and Z4 and transversal striae posteriorly to Z4; dorsal setae setiform, smooth and sharp-tipped, except Z5, serrate; Z4 shorter than distance between its base and that of S5; S4 shorter than the distance between its base and that of S5; r3 and R1 inserted on integument; sternal shield with 3 pairs of setae and a median lobe on posterior margin; distal third of calyx of spermatheca bell-shaped proximal two-thirds slender; atrium bulbous; a single and slightly knobbed macroseta on basitarsus of leg IV.

**FEMALE.** (8 specimens measured). Idiosomal setal pattern: 12A:8A/JV: ZV.

**Dorsum.** Dorsal shield 322 (318–330) long and 170 (165–174) wide, with lateral striae, light reticulations between j6 and Z4 and transversal striae posteriorly to Z4. With 5 pairs of solenostomes. Setae j1 19 (18–22), j3 26 (24–27), j4 17 (16–18), j5 16 (15–18), j6 20 (20–21), J2 22 (21–25), J5 11 (10–12), z2 21 (20–22), z3 26 (25–28), z4 26 (25–28), z5 18 (17–20), Z4 30 (28–33), Z5 44 (41–48), s4 29 (26–31), s6 30 (28–32), S2 35 (33–37), S4 30 (28–33), S5 18 (16–19), r3 29 (27–31), R1 25 (24–27). Setae smooth and sharp-tipped, except Z5, serrate.

**Peritreme.** Extending to level between j1 and j3.

**Venter.** Sternal shield smooth, with 3 pairs of setae; posterior margin with lightly sclerotized median lobe; distances between ST1–ST3 70 (68–73), ST2–ST2 59 (57–61). Genital shield smooth; distance between ST5–ST5 54 (53–56). Ventrianal shield smooth, pentagonal, with anterior margin slightly concave, 102 (100–105) long, 70 (68–76) wide at level of ZV2, 64 (62–68) wide at level of anus, with 4 pairs of pre-anal setae; round pre-anal pores posterior to and transversally in line with JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

**Chelicera.** Movable digit 24 (23–24) long, with 3 teeth; fixed digit 24 (23–24) long, with 6–7 teeth.

**Spermatheca.** Distal third of calyx bell-shaped proximal two-thirds slender, 28 (27–28) long; atrium bulbous.

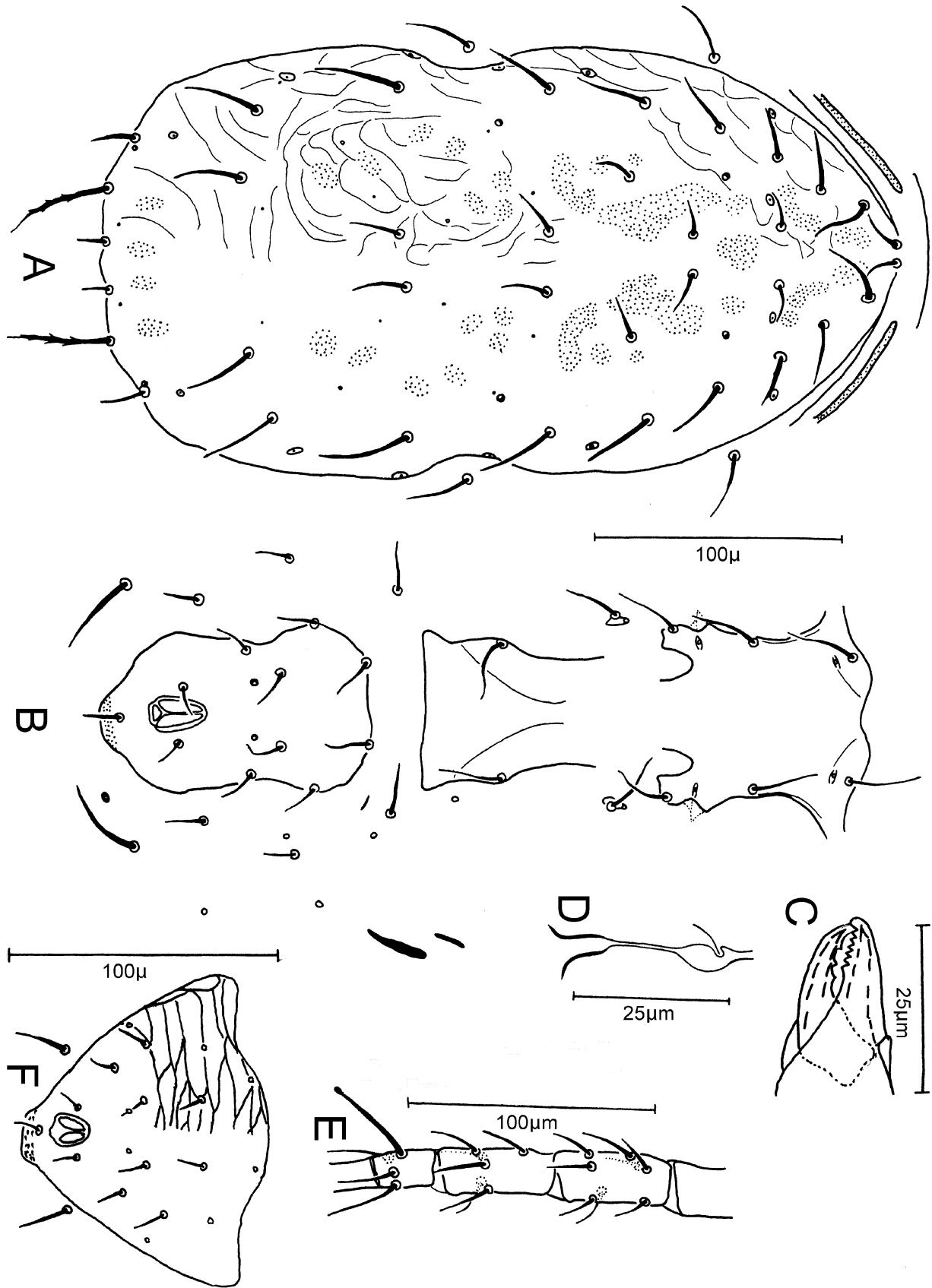


FIGURE 46. *Typhlodromus (Anthoseius) subtilis* Zannou, Moraes & Oliveira, n. sp.: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Ventrianal shield.

Legs. Macroseta slightly knobbed: St IV 39 (35–42). Chaetotaxy: genu II: 2-2/1, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (1 specimen measured).

Dorsum. Dorsal shield pattern and setae as in female, 235 long and 140 wide. Setae j1 16, j3 25, j4 18, j5 18, j6 19, J2 19, J5 9, z2 21, z3 25, z4 23, z5 17, Z4 23, Z5 28, s4 29, s6 26, S2, 27, S4 22, S5 15, r3 28, R1 23. Setae smooth, except for Z5 serrate.

Peritreme. Extending to level between j3 and z2.

Venter. Ventrianal shield subtriangular, faintly reticulate anteriorly to ZV2, free from peritrematal shields, 90 long, 115 wide at anterior corners; with 4 pairs of pre-anal setae and 2 distinguishable pairs of lyrifissures (1 anterior to JV1 and 1 lateral, almost in transversal line with JV1); round pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Shaft 17 long (position renders drawing impossible).

Legs. Macroseta slightly knobbed, St IV 35. Chaetotaxy of genua II and III as in female.

**Locality and type material.** Holotype, 7 paratype females and 1 allotype male from *Protea gagedi*, 150 km SW Mpika, Zambia, 17-VI-1992, J.S. Yaninek, deposited at ESALQ-USP.

**Etymology.** The name *subtilis* refers to the slender major portion of the calyx of the spermatheca of this species.

**Remarks.** *Typhlodromus (A.) astibus* Ueckermann & Loots differs from this species by having Z4 longer than the distance between its base and that of S5, S4 longer than the distance between its base and that of S5, R1 inserted on dorsal shield. *Typhlodromus (A.) matthyssei* Ueckermann & Loots differs from this new species by having most dorsal setae much shorter, Z4 and S5 serrate, Z5 knobbed, and by lacking macrosetae on legs. *Typhlodromus (A.) celastrus* Ueckermann & Loots and *T. (A.) gardeniae* Schultz differ by having setae Z5 and JV5 knobbed, calyx of spermatheca tubular, without a distinct constriction, atrium not bulbous.

### ***Typhlodromus (Anthoseius) sudanicus* El-Badry**

*Typhlodromus sudanicus* El-Badry, 1967b: 106.

*Mumaseius sudanicus*, Abbasova, 1972: 18.

*Amblydromella sudanica*, Moraes *et al.*, 1986: 176.

*Typhlodromus (Anthoseius) sudanicus*, Ueckermann & Loots, 1988: 51; Moraes *et al.*, 2004: 352; Chant & McMurtry, 2007: 155.

*Typhlodromus hierochunticus* Amitai & Swirski, 1968: 35 (synonym by Abbasova, 1972).

**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield smooth; dorsal setae smooth and sharp-tipped; setae J2, Z4, Z5 and S5 inserted on tubercles; setae r3 and R1 inserted on integument; seta ST3 on sternal shield; posterior margin of sternal shield indistinct; ventrianal shield pentagonal, strongly constricted at level of pre-anal pores, with 4 pairs of pre-anal setae (seta JV3 present); JV5 smooth and sharp-tipped; calyx of spermatheca bell-shaped and constricted near atrium; peritreme extending to level of j1; fixed and movable cheliceral digits with 1 tooth each; with a single and sharp-tipped macroseta, on tarsus of leg IV. Described from specimens collected at Barakat, Gezira, Sudan, on *Gossypium* sp. No additional specimens collected in the present study.

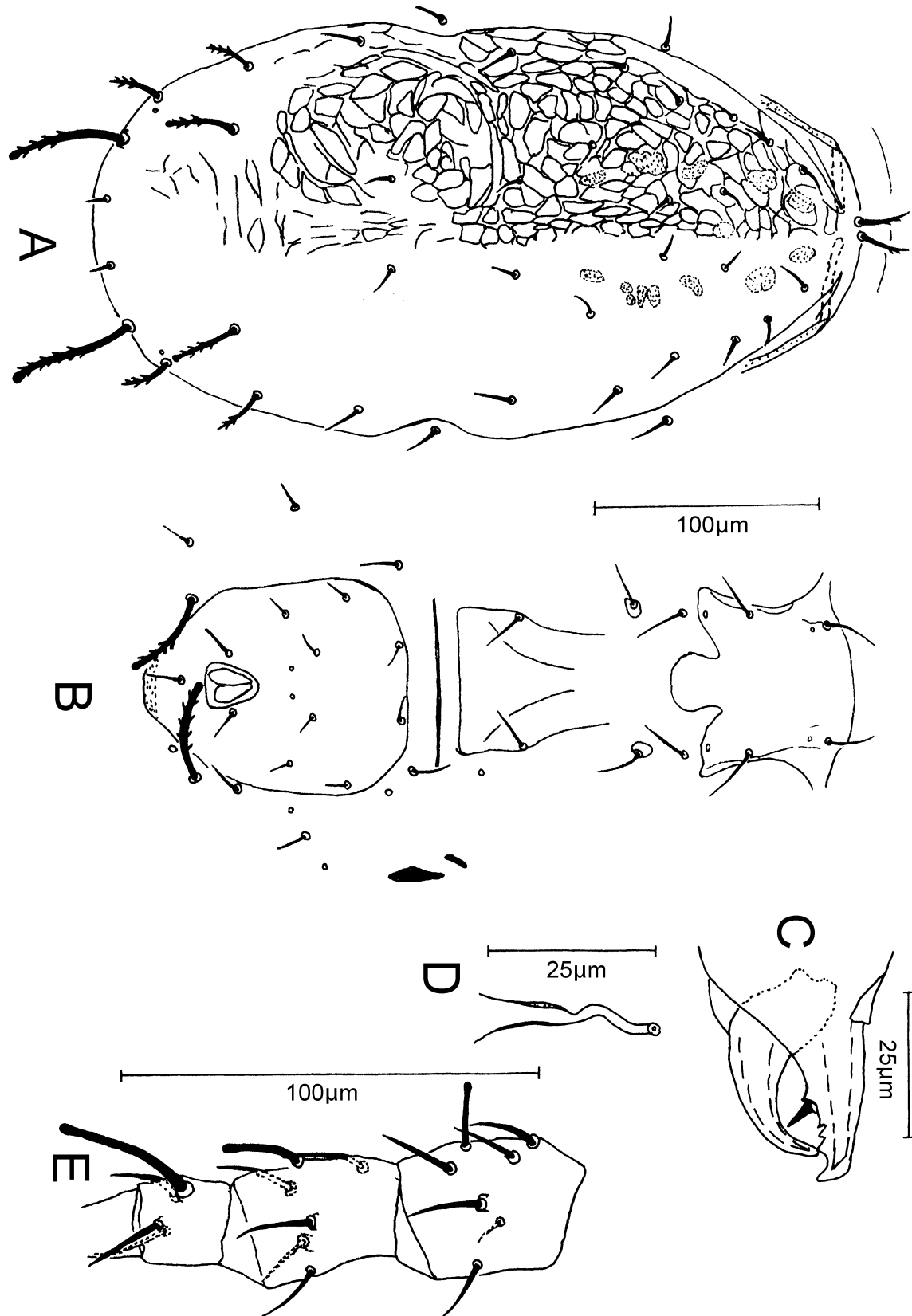
**World distribution.** Sudan.

### ***Typhlodromus (Anthoseius) terrulentis* Van der Merwe**

(Fig. 47)

*Typhlodromus (Anthoseius) terrulentis* Van der Merwe, 1968: 42; Moraes *et al.*, 2004: 354; Chant & McMurtry, 2007: 155.

*Amblydromella terrulentis*, Moraes *et al.*, 1986: 176.



**FIGURE 47.** *Typhlodromus (Anthoseius) terrulentis* Van der Merwe (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.



FEMALE. (Specimens measured—South Africa: holotype and 4 additional specimens). Idiosomal setal pattern: 12A:8A/JV:ZV.

Dorsum. Dorsal shield 343 (333–357) [333] long and 187 (177–198) [177] wide, reticulate. With 5 pairs of solenostomes, not all indicated in fig. 47A. Setae j1 21 (19–23) [21], j3 15 (14–16) [14], j4 11 (9–11) [9], j5 11 (9–12) [11], j6 12 (11–14) [12], J2 12 (10–15) [13], J5 11 (10–12) [10], z2 11 (10–12) [10], z3 13 (11–14) [11], z4 13 (12–15) [13], z5 11 (10–13) [10], Z4 31 (26–34) [29], Z5 55 (44–60) [54], s4 15 (14–17) [14], s6 18 (16–19) [17], S2 20 (19–22) [19], S4 24 (22–26) [23], S5 24 (24–26) [22], r3 16 (14–18) [14], R1 18 (15–17) [15]. Setae smooth, except j1, S4, S5, Z4 and Z5, serrate; and Z4 and Z5, knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin with a median lobe; distances between ST1–ST3 58 (55–60), ST2–ST2 57 (56–57). Genital shield smooth; distance between ST5–ST5 54 (52–60) [52]. Ventrianal shield smooth, almost subquadrate, with anterior margin straight, 115 (103–121) [119] long, 97 (92–107) [92] wide at level of ZV2, 87 (78–102) [85] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate and knobbed.

Chelicera. Movable digit 32 (30–35) [31] long, with no teeth; fixed digit 27 (26–29) [27] long, with 4 teeth.

Spermatheca. Calyx a long, slender tube flaring toward vesicle, 26 (23–28) [28] long.

Legs. Macrosetae knobbed; Sge IV 15 (14–17) [14], Sti IV 21 (18–24) [18], St IV 34 (30–39) [33]. Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female, North West Province, Potchefstroom, in soil, 8-X-1964, G.C. Loots; 1 female, Eastern Cape Province, 30 km from East London to Umtata, on *Helichrysum cymosum*, 9-II-1974, F.W. Schultz; 1 female, Eastern Cape Province, 30 km from East London to Umtata, on *Acacia* sp., 9-II-1974, C. Colijn; 1 female, Eastern Cape Province, Buffels Pass, East London, on *Chloris gayana*, 9-II-1974, F.W. Schultz; 1 female, Mpumalanga Province, Kaapsche Hoop, on *Helichrysum reflexum*, 5-X-1981, E.A. Ueckermann.

**World distribution.** South Africa.

### *Typhlodromus (Anthoseius) theroni* Ueckermann & Loots

(Fig. 48)

*Typhlodromus (Anthoseius) theroni* Ueckermann & Loots, 1988: 57; Moraes *et al.*, 2004: 354; Chant & McMurtry, 2007: 157.

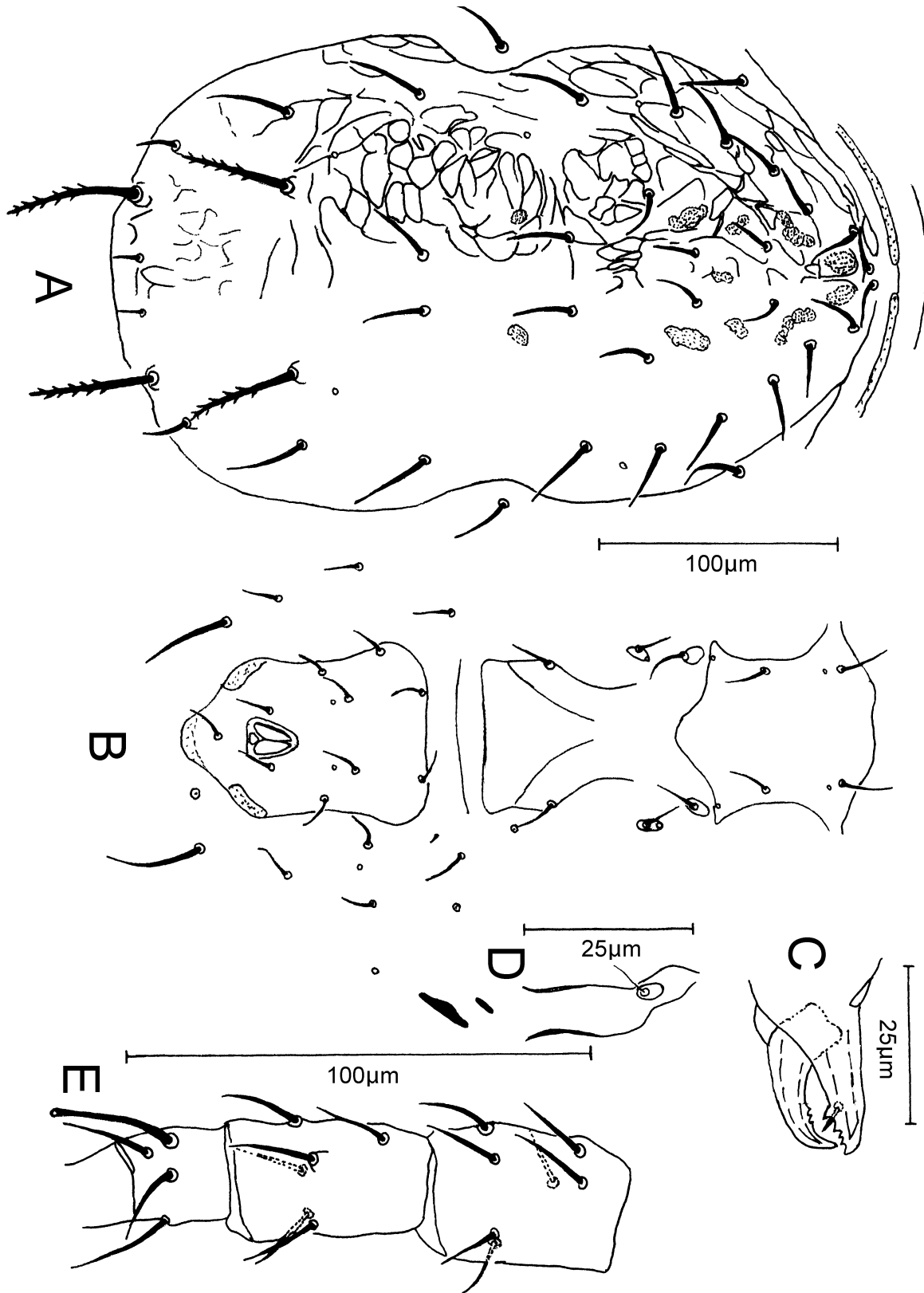
*Amblydromella (Aphanoseius) theroni*, Denmark & Welbourn, 2002: 309.

FEMALE. Specimens measured—Namibia: Holotype and 1 paratype; South Africa: 1 paratype; Zimbabwe: 5 paratypes. Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 317 (295–332) [325] long and 175 (166–186) [186] wide, reticulate anteriorly to Z4 and striate posteriorly to the latter. With 5 pairs of solenostomes not indicated in fig. 48A. Setae j1 20 (18–24) [19], j3 26 (24–28) [26], j4 21 (16–25) [16], j5 21 (17–24) [18], j6 26 (22–30) [25], J2 32 (25–37) [28], J5 10 (9–11) [10], z2 20 (18–24) [20], z3 26 (24–29) [27], z4 28 (24–32) [27], z5 23 (19–27) [21], Z4 46 (41–50) [44], Z5 55 (50–60) [52], s4 30 (26–33) [30], s6 34 (30–40) [33], S2 37 (31–40) [33], S4 35 (33–39) [33], S5 19 (16–21) [19], r3 25 (22–28) [26], R1 25 (22–28) [26]. Setae smooth and sharp-tipped, except Z4 and Z5, serrate.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a median lobe; distances between ST1–ST3 59 (56–62) [59], ST2–ST2 51 (47–54) [48]. Genital shield smooth;



**FIGURE 48.** *Typhlodromus (Anthoseius) theroni* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

distance between ST5–ST5 55 (51–60) [54]. Ventrianal shield smooth, pentagonal, with anterior margin slightly concave, 103 (93–116) [102] long, 72 (67–79) [79] wide at level of ZV2, 67 (62–72) [67] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present; with one member of ZV2 off the shield); round

pre-anal pores posterior to and longitudinally aligned with JV2. With 2 pairs of metapodal shields. Caudoven-tral setae smooth and sharp-tipped.

Chelicera. Movable digit 24 (24–26) [24] long, with 3 teeth; fixed digit 22 (21–24) [22] long, with 4 teeth. Spermatheca. Calyx saccular, 16 (13–18) [17] long; atrium small, between calyx and major duct.

Legs. Macroseta knobbed; St IV 25 (23–28) [23]. Chaetotaxy: genu II: 2-2/0, 2/0-1 or 2-2/1, 2/0-1 on one leg in holotype; genu III: 1-2/1, 2/0-1.

**Specimens examined. Namibia:** Holotype female and 1 paratype female, Kuseb River, Gobabeb, on *Pechuel-loeschea leubnitziae*, 11-II-1980, P.D. Theron. **South Africa:** 1 paratype female, Kwazulu/Natal, farm Wekom near Ngweni, on *Xeromphis obovata*, 21-VIII-1980, M.K.P. Smith Meyer. **Zimbabwe:** 2 paratype females, 13 km from Shamva to Harare, on *Maerua pubescens*, 7-XI-1969, W.G. Duncombe; 3 paratype females, 11 km from Que Que to Gatooma, on *Ximenia caffra*, 30-X-1969, W.G. Duncombe.

**World distribution.** Namibia, South Africa, Zimbabwe.

### *Typhlodromus (Anthoseius) totifolianensis* El-Banhawy & Abou-Awad

*Typhlodromus totifolianensis* El-Banhawy & Abou-Awad, 1991: 218.

*Typhlodromus (Anthoseius) totifolianensis*, Moraes *et al.*, 2004: 354; Chant & McMurtry, 2007: 157.

**Remarks.** Female with idiosomal setal pattern 12A:8A/JV:ZV; dorsal shield reticulate between setae j4 and Z4; dorsal setae smooth and sharp-tipped, except Z4, lanceolate and serrate, and Z5, serrate and knobbed; setae r3 and R1 inserted on integument; seta ST3 off sternal shield; posterior margin of sternal shield with median lobe; ventrianal shield pentagonal, with few lateral striae, with 4 pairs of pre-anal setae (seta JV3 present); JV5 smooth and knobbed; calyx of spermatheca tubular; peritreme extending to level of j1; with macrosetae only on genu, tibia and tarsus of leg IV. Described from specimens collected at Arusha, Tanzania, on unspecified substrate. No additional specimens collected in the present study.

**World distribution.** Tanzania.

### *Typhlodromus (Anthoseius) transvaalensis* (Nesbitt)

(Fig. 49)

*Kampimodromus transvaalensis* Nesbitt, 1951: 55.

*Typhlodromus (Anthoseius) jackmickleyi* De Leon, 1958: 75. (synonymy by Muma & Denmark, 1968)

*Typhlodromus pectinatus* Athias-Henriot, 1958: 179. (synonymy by Muma & Denmark, 1968)

*Typhlodromus (Typhlodromus) transvaalensis*, Chant, 1959: 60.

*Neoseiulus transvaalensis*, Muma, 1961: 295.

*Typhlodromus (Neoseiulus) transvaalensis*, Pritchard & Baker, 1962: 222.

*Mumaseius transvaalensis*, Abbasova, 1970: 1410.

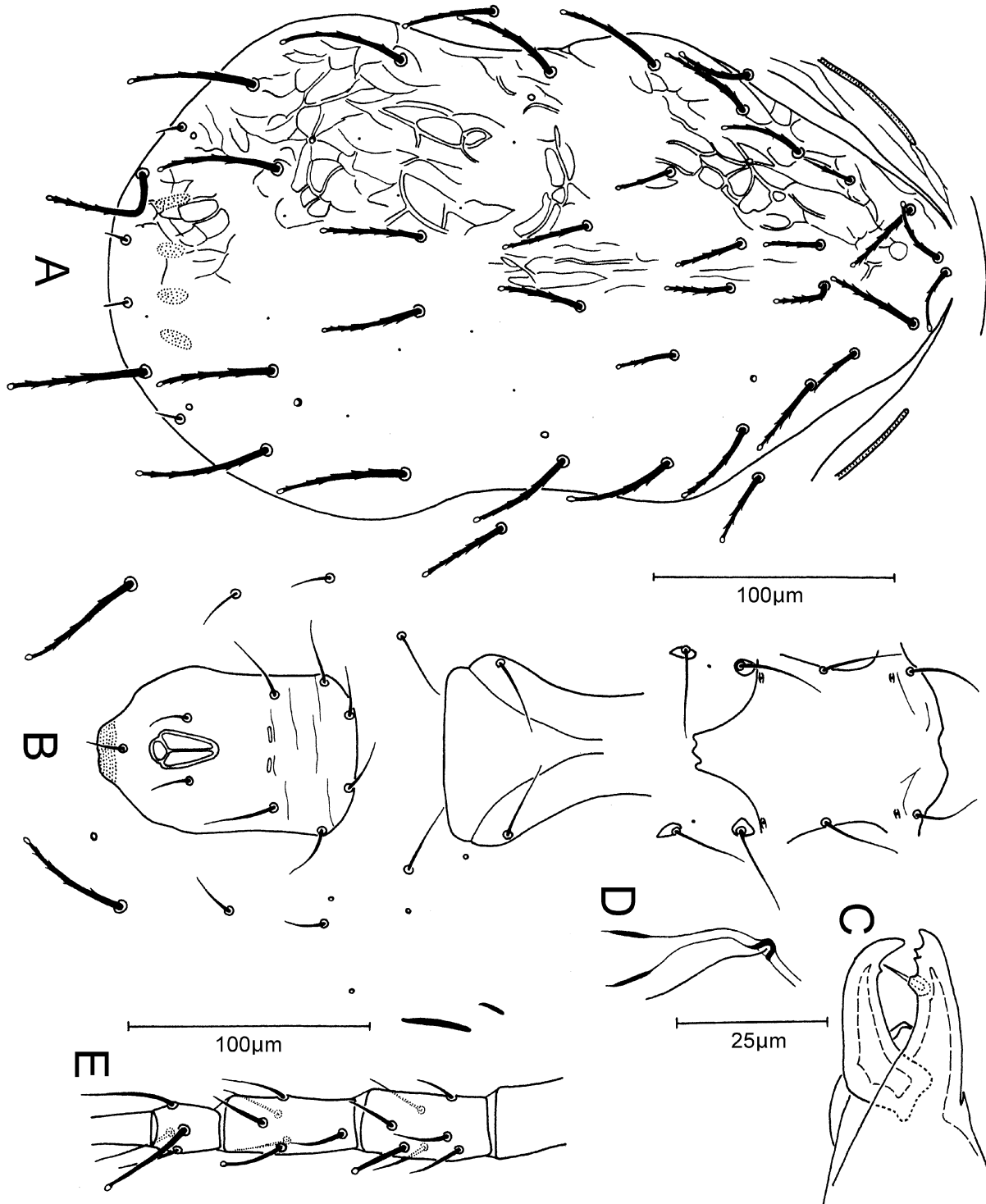
*Anthoseius (Anthoseius) transvaalensis*, Wainstein & Vartapetov, 1973: 104.

*Anthoseius transvaalensis*, Beglyarov, 1981: 21.

*Typhlodromus (Anthoseius) transvaalensis*, Moraes *et al.*, 2004: 355; Chant & McMurtry, 2007: 157.

FEMALE. Specimen measured—Kenya: 2; Cape Verde: 1; South Africa: 6. Idiosomal setal pattern: 12A:8A/JV-3: ZV.

Dorsum. Dorsal shield 352 (325–373) long and 210 (188–232) wide, faintly to distinctly reticulate. With 5 pairs of solenostomes. Setae j1 28 (25–30), j3 38 (36–40), j4 30 (26–33), j5 30 (26–33), j6 38 (35–41), J2 44 (40–46), J5 9 (9–10), z2 24 (21–28), z3 38 (36–40), z4 41 (39–42), z5 22 (21–28), Z4 52 (47–60), Z5 62 (57–70), s4 45 (42–49), s6 49 (46–54), S2 55 (50–57), S4 56 (53–56), S5 9 (8–11), r3 32 (29–35), R1 40 (38–41). Setae serrate and knobbed, except S5 and J5, smooth and sharp-tipped.



**FIGURE 49.** *Typhlodromus (Anthoseius) transvaalensis* (Nesbitt) (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

Peritreme. Extending to level between j3 and z2.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on separate shields); posterior margin with a tri- or bi-dentate projection; distances between ST1–ST3 68 (65–70), ST2–ST2 60 (54–63). Genital shield smooth; distance between ST5–ST5 74 (67–80). Ventrianal shield striate anteriorly to anus, pentagonal, with anterior margin convex, 118 (107–130) long, 76 (73–78) wide at level of ZV2, 78 (73–84) wide at level of

anus, with 3 pairs of pre-anal setae (JV3 absent); pre-anal pores absent. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, serrate and knobbed.

Chelicera. Movable digit 30 (30–31) long, with 1 tooth; fixed digit 28 (26–30) long, with 2 teeth.

Spermatheca. Calyx elongate, funnel-shape, with distal 1/4 of its length thick-walled, 19 (13–30) long; atrium nodular.

Legs. Macrosetae knobbed: Sge IV 26 (25–26), Sti IV 27 (24–29), St IV 46 (40–50). Chaetotaxy: genu II: 2-2/1, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Specimens examined. Kenya:** 7 females, unknown location, in *Galleria* sp. (Lepidoptera) colony, 30-I-1991, B.B. Allard. **Cape Verde:** 7 females, Sao Jorge, on *Coccus viridis*, I-1986, A. van Harten. **South Africa:** 3 females, Kwazulu/Natal, Empangeni, from soil, 6-I-1965, G. Nel; 2 females, Kwazulu/Natal, Empangeni, from soil, 5-IV-1965, G. Nel; 1 female, Kwazulu/Natal, Empangeni, on *Saccharum officinarum*, 18-I-1965, G. Nel.

**Remarks.** The specimens from Kenya are smaller and consequently have relatively shorter dorsal setae. One specimen from Kenya has setae j1 and z2 sharp-tipped and j4 is sharp-tipped in 2 specimens.

**World distribution.** Algeria, Australia, Azerbaijan, Brazil, Cameroon, Cape Verde, China, Colombia, Costa Rica, Egypt, Georgia, Guinea, Hawaii, Indonesia, Israel, Jordan, Kenya, New Caledonia, Panama, Philippines, Reunion Island, Russia, Singapore, South Africa, Taiwan and USA.

### ***Typhlodromus (Anthoseius) umbraculus* Ueckermann & Loots** (Fig. 50)

*Typhlodromus (Anthoseius) umbraculus* Ueckermann & Loots, 1988: 33, Moraes *et al.*, 2004: 356; Chant & McMurtry, 2007: 157.

*Amblydromella (Aphanoseia) umbraculus*, Denmark & Welbourn, 2002: 309.

FEMALE. (Specimens measured—South Africa: holotype and 1 paratype). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 339 [327] long and 177 [168] wide; reticulate. With 5 pairs of solenostomes. Setae j1 18 [18], j3 17 [16], j4 11 [12], j5 12 [11], j6 13 [13], J2 16 [15], J5 11 [10], z2 11 [12], z3 14 [16], z4 14 [15], z5 12 [12], Z4 17 [18], Z5 42 [42], s4 15 [15], s6 18 [16], S2 18 [17], S4 21 [19], S5 17 [18], r3 18 [18], R1 14 [13]. Setae smooth, stout and blunt; except Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (JV3 on integument); posterior margin with a median lobe; distances between ST1-ST3 60 [57], ST2-ST2 50 [50]. Genital shield smooth; distance between ST5-ST5 48 [50]. Ventrianal shield smooth, pentagonal, with anterior margin slightly convex, 105 [100] long, 83 [79] wide at level of ZV2, 79 [79] wide at level of anus, with 4 pairs of pre-anal setae (one member of setae JV3 missing in holotype); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, knobbed.

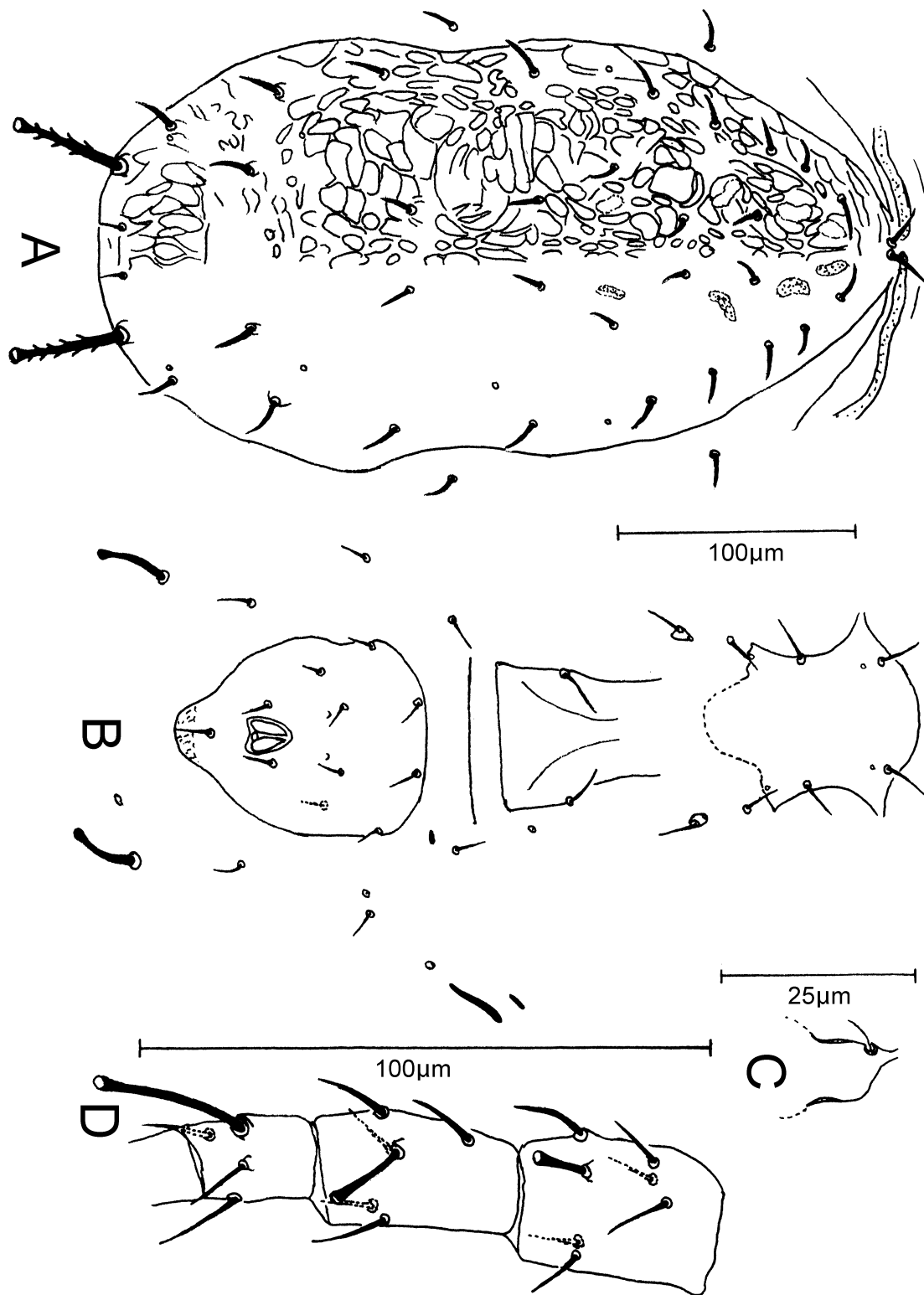
Chelicera. Movable digit 23 [22] long, apparently with 2 teeth; fixed digit 20 long, apparently with 4 teeth.

Spermatheca. Calyx bell-shaped, 9 [9] long.

Legs. Macrosetae knobbed; Sge IV 11 [11], Sti IV 15 [15], St IV 18 [27]. Chaetotaxy: genu II: 2-2/0, 2/0-1 or 2-2/1, 2/0-1 one leg II of holotype); genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female, Limpopo Province, Magoebaskloof, on an unidentified plant, 26-V-1983, E.A. Ueckermann; 1 paratype female, Limpopo Province, Magoebaskloof, on *Dicliptera clinopodia*, 26-V-1983, E.A. Ueckermann.

**World distribution.** South Africa.



**FIGURE 50.** *Typhlodromus (Anthoseius) umbraculus* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

***Typhlodromus (Anthoseius) vescus* Van der Merwe**  
(Fig. 51)

*Typhlodromus (Anthoseius) vescus* Van der Merwe, 1968: 48; Moraes *et al.*, 2004: 357.

*Typhlodromus (Anthoseius) anitrae* Schultz, 1973: 98 (synonym according to Ueckermann & Loots, 1988).  
*Typhlodromus (Anthoseius) meyeriae* Schultz, 1973: 101 (synonym according to Ueckermann & Loots, 1988).  
*Typhlodromus (Typhlodromus) vescus*, Tseng, 1983: 70.  
*Amblydromella vesca*, Moraes *et al.*, 1986: 178.  
*Amblydromella (Amblydromella) vesca*, Denmark & Welbourn, 2002: 307.

FEMALE. (Specimens measured—South Africa: holotype, 3 paratype and 4 additional specimens). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 331 (309–343) [341] long and 186 (160–200) [187] wide; lightly reticulate. With 5 pairs of solenostomes, not all indicated in fig. 51A. Setae j1 19 (17–21) [20], j3 23 (20–25) [22], j4 15 (13–17) [14], j5 15 (14–16) [15], j6 19 (17–22) [17], J2 23 (19–26) [22], J5 10 (9–12) [9], z2 18 (16–19) [19], z3 21 (19–22) [21], z4 21 (19–22) [22], z5 18 (17–19) [18], Z4 34 (25–39) [38], Z5 58 (51–64) [64], s4 23 (20–25) [25], s6 26 (23–28) [26], S2 29 (23–33) [29], S4 31 (24–38) [35], S5 12 (10–14) [10], r3 21 (18–23) [20], R1 20 (17–23) [22]. Setae smooth, except Z4, serrate; and Z5, serrate and knobbed.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 3 pairs of setae; posterior margin with a median lobe; distances between ST1–ST3 57 (54–60) [58], ST2–ST2 57 (55–58) [56]. Genital shield smooth; distance between ST5–ST5 61 (55–66) [59]. Ventrianal shield smooth, pentagonal, with anterior margin convex, 111 (101–119) [114] long, 91 (81–96) [90] wide at level of ZV2, 78 (69–84) [78] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); elliptical pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudovernal setae smooth and sharp-tipped, except JV5, knobbed.

Chelicera. Movable digit 26 (25–28) [28] long, with 3 teeth; fixed digit 25 (23–27) [24] long, with 5 teeth.

Spermatheca. Calyx a broad tube, 12 (10–14) [14] long; atrium small, incorporated in calyx.

Legs. Macrosetae knobbed; Sge IV 17 (14–21) [16], Sti IV 20 (18–22) [19], St IV 29 (25–32) [32]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimen measured—South Africa: 1)

Dorsum. Dorsal shield pattern and setae as in female, 252 long and 164 wide. Setae j1 17, j3 19, j4 14, j5 13, j6 16, J2 20, J5 10, z2 14, z3 17, z4 17, z5 15, Z4 27, Z5 38, s4 20, s6 21, S2 22, S4 23, S5 10, r3 17, R1 16.

Peritreme. Extending to level of j1.

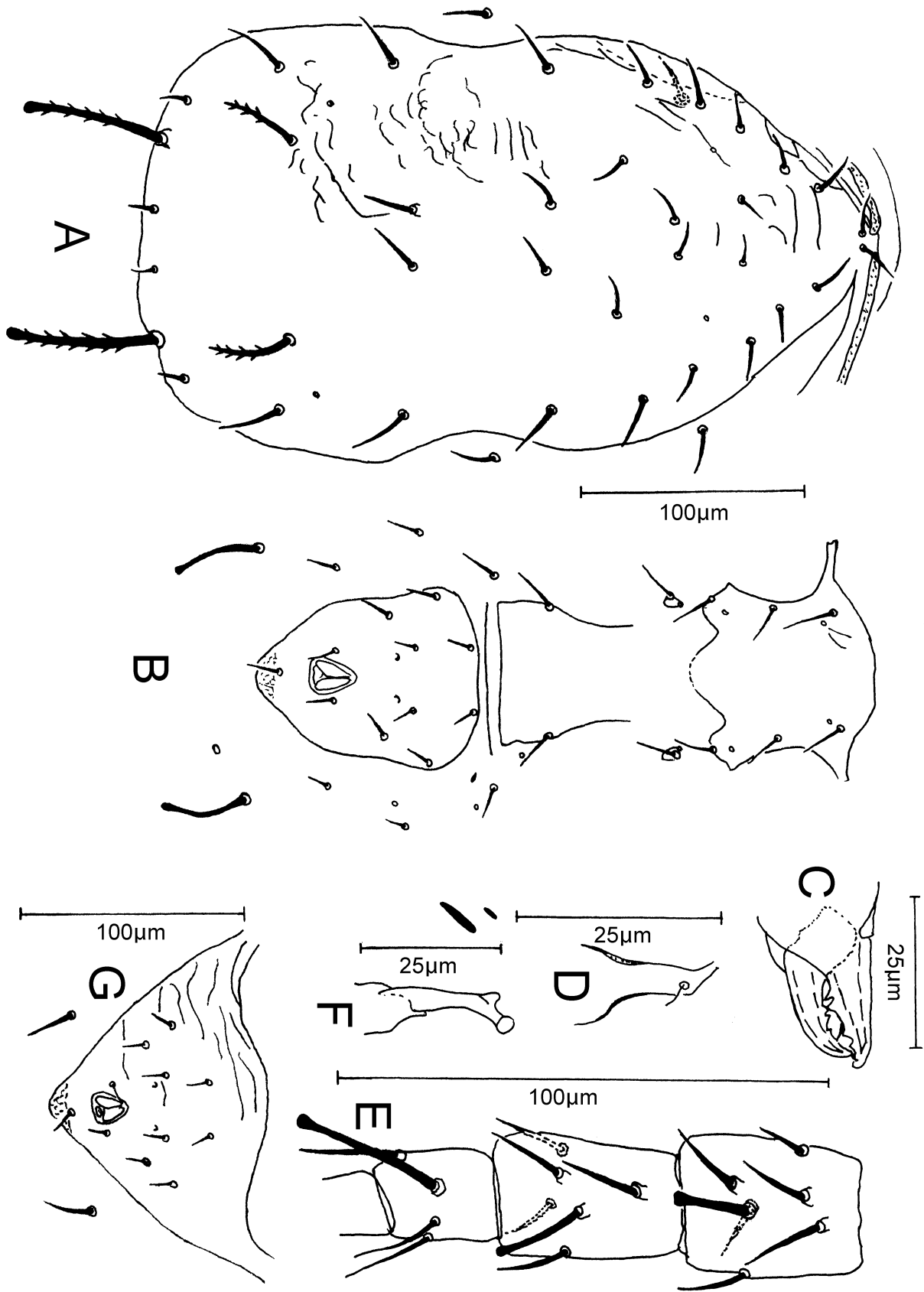
Venter. Ventrianal shield subtriangular, striate, fused with peritrematal shields, 96 long, 143 wide at the anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures; elliptical pre-anal pores posteromesad of JV2. Caudovernal setae smooth and sharp-tipped.

Spermatodactyl. Shaft straight for most of its length, bent distally, 19 long.

Legs. Macrosetae knobbed; Sge IV 14, Sti IV 17, St IV 24. Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female and 2 paratype females, Mpumalanga Province, Nelspruit, on *Mangifera indica*, 4-IV-1955, P.A.J. Ryke; 1 paratype female, Mpumalanga Province, Nelspruit, on an unidentified plant, 4-IV-1955, P.A.J. Ryke; 1 female, Mpumalanga Province, Barberton district, on *Dalbergia armata*, 24-III-1976, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Fort Grey Forestry near East London, on *Hibiscus pedunculatus*, 2-XII-1977, M.K.P. Smith Meyer; 1 female and 1 male, Mpumalanga Province, Blyde River Canyon, on *Heteropyxis natalensis*, 23-II-1978, E. van den Berg; 1 female, Mpumalanga Province, Institute for Tropical and Subtropical Crops, Nelspruit, on *Pomcirus trifoliata*, 29-III-1979, J. Botha.

**World distribution.** South Africa.



**FIGURE 51.** *Typhlodromus (Anthoseius) vescus* Van der Merwe: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male— F. Spermatodactyl; G. Ventrianal shield.



***Typhlodromus (Anthoseius) weneri* Schultz**

(Fig. 52)

*Typhlodromus (Anthoseius) weneri* Schultz, 1973: 96; Moraes *et al.*, 2004: 358; Chant & McMurtry, 2007: 157.

*Amblydromella weneri*, Moraes *et al.*, 1986: 178.

*Amblydromella (Aphanoseia) weneri*, Denmark & Welbourn, 2002: 309.

FEMALE. (Specimens measured—Malawi: holotype and 2 paratypes). Idiosomal setal pattern 12A:8A/JV:ZV

Dorsum. Dorsal shield 397 (386–407) [407] long and 208 (206–211) [211] wide; striate laterally and dorsocentrally around Z4, reticulate dorsocentrally between j3 and Z4 and between S5 and J5. With 5 pairs of solenostomes. Setae j1 21 (20–21) [20], j3 24 (23–25) [25], j4 15 (14–15) [14], j5 15 (13–16) [15], j6 18 [18], J2 23 (21–24) [23], J5 12 (10–13) [10], z2 25 (21–32) [21], z3 23 (22–25) [22], z4 23 (21–26) [23], z5 15 (13–17) [13], Z4 38 (35–40) [38], Z5 53 (50–55) [53], s4 26 (24–29) [24], s6 32 (31–32) [32], S2 34 (32–35) [34], S4 37 (32–40) [40], S5 40 (37–42) [37], r3 22 (21–23) [23], R1 20 (19–21) [19]. Setae smooth and sharp-tipped, except Z5, slightly serrate.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (JV3 on integument); according to the original description, posterior margin with a bi-dentate median projection, which became vague in holotype since original description; distances between ST1–ST3 68 (63–73) [73], ST2–ST2 53 (52–53) [53]. Genital shield smooth; distance between ST5–ST5 60 (59–61) [61]. Ventrianal shield smooth, pentagonal, with anterior margin slightly convex, 138 (132–144) [132] long, 83 (82–83) [83] wide at level of ZV2, 80 (79–80) [80] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); pre-anal pores absent. Setae ZV3 inserted on small platelets in all examined type specimens. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 25 (24–26) [24] long, with 1 tooth; fixed digit 24 (23–25) [23] long, with 5 teeth.

Spermatheca. Calyx bell-shaped, 13 (12–13) [12] long; atrium small, incorporated in calyx.

Legs. Macroseta sharp-tipped or blunt; St IV 27 (27–28) [27]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined.** Malawi: Holotype female and 2 paratype females, Chitila Research Station, on *Urochloa mossambicensis*, 10-IV-1970, M.K.P. Smith Meyer.

**World distribution.** Malawi.

***Typhlodromus (Anthoseius) wrenschae* Ueckermann & Loots**

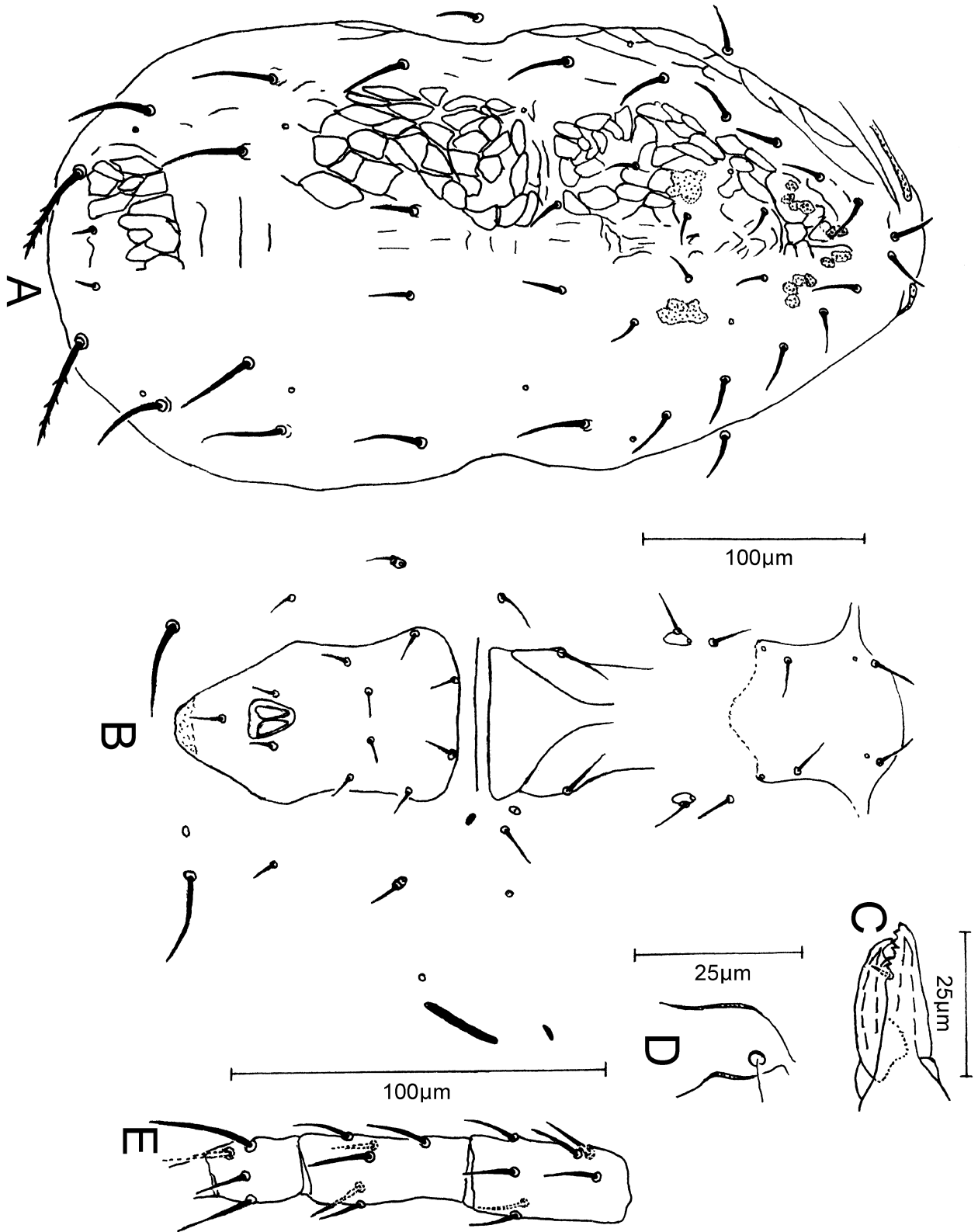
(Fig. 53)

*Typhlodromus (Anthoseius) wrenschae* Ueckermann & Loots, 1988: 47; Moraes *et al.*, 2004: 359; Chant & McMurtry, 2007: 157.

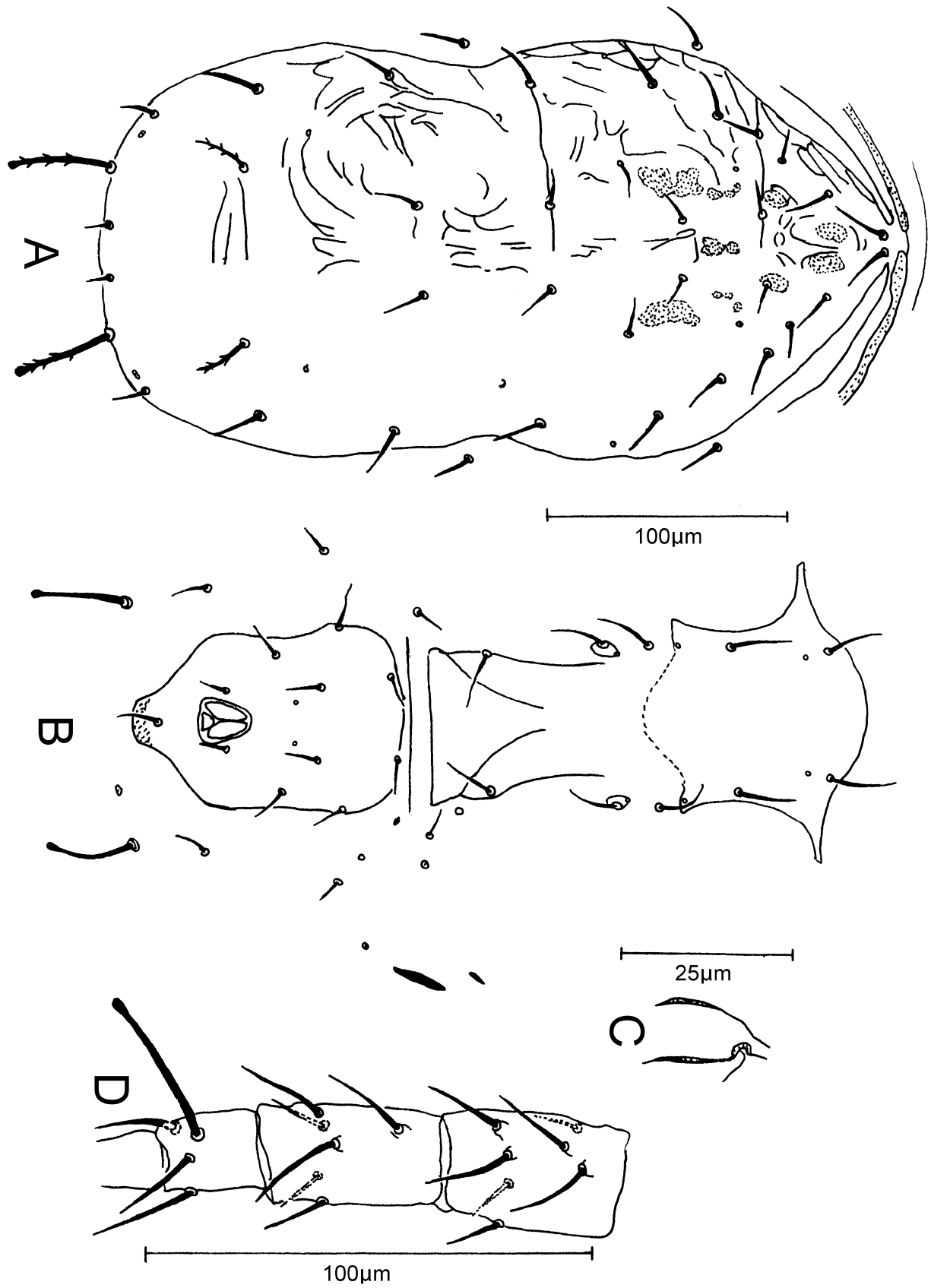
*Amblydromella (Aphanoseia) wrenschae*, Denmark & Welbourn, 2002: 309.

FEMALE. (Specimens measured—South Africa: holotype and 2 paratypes). Idiosomal setal pattern 12A:8A/JV:ZV.

Dorsum. Dorsal shield 327 (317–338) [317] long and 167 (162–172) [162] wide, lightly reticulate anteriorly to Z4. With 5 pairs of solenostomes. Setae j1 20 (20–21) [20], j3 20 (19–21) [19], j4 14 (13–15) [13], j5 15 (14–16) [14], j6 15 (14–17) [14], J2 19 (18–20) [18], J5 11 (10–12) [10], z2 14 (12–17) [12], z3 18 (17–20) [17], z4 18 (17–20) [18], z5 16 (15–18) [15], Z4 23 (21–25) [21], Z5 40 (38–42) [38], s4 18 (16–20) [18], s6 21 (20–22) [20], S2 22 (21–24) [21], S4 22 (20–25) [20], S5 13 (10–15) [14], r3 19 (18–19) [18], R1 18 (17–19) [18]. Setae smooth and sharp-tipped, except Z4, serrate, and Z5, serrate and knobbed.



**FIGURE 52.** *Typhlodromus (Anthoseius) wernerii* Schultz (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.



**FIGURE 53.** *Typhlodromus (Anthoseius) wrenschae* Ueckermann & Loots (female): A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV.

Peritreme. Extending to level of j1.

Venter. Sternal shield smooth, with 2 pairs of setae (ST3 on integument); posterior margin with a median lobe; distances between ST1–ST3 64 (59–68) [66], ST2–ST2 55 (55–56) [56]. Genital shield smooth; distance between ST5–ST5 55 (52–59) [52]. Ventrianal shield pentagonal, smooth, with anterior margin straight to slightly convex, 107 (105–111) [106] long, 77 (69–86) [69] wide at level of ZV2, 72 (68–77) [68] wide at level of anus, with 4 pairs of pre-anal setae (seta JV3 present); round pre-anal pores posteromesad of JV2. With 2 pairs of metapodal shields. Caudoventral setae smooth and sharp-tipped, except JV5, with small knob.

Chelicera. Movable digit 29 (28–29) [29] long, with 3 teeth; fixed digit 26 [26] long, with 5 teeth. Position renders its drawing impossible.

Spermatheca. Calyx bell-shaped, 12 (11–13) [11] long; atrium small, incorporated in calyx.

Legs. Macroseta knobbed; St IV 36 (35–37) [36]. Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

**Specimens examined. South Africa:** Holotype female, Limpopo Province, Ebenezer Dam near Tzaneen, on *Cupressus* sp., 24-V-1983, M.K.P. Smith Meyer; 1 paratype female, Limpopo Province, Ebenezer Dam near Tzaneen, on *Spiraea cantoniensis*, 24-V-1983, E.A. Ueckermann; 1 paratype female, Limpopo Province, Duiwelskloof, on *Acacia caffra*, 07-V-1981, E. Kassimatis.

**World distribution.** South Africa.

### ***Typhlodromus (Typhlodromus) Scheuten***

*Typhlodromus* Scheuten, 1857: 111.

*Typhlodromus (Typhlodromus)*, Chant, 1957: 528; Chant & McMurtry, 1994: 255; Moraes *et al.*, 2004: 360; Chant & McMurtry, 2007: 157.

*Wainsteinius* Arutunjan, 1969: 180 (synonym by Chant & McMurtry, 1994).

*Typhlodromus (Oudemanus)* Denmark, 1992: 34 (synonym by Chant & McMurtry, 1994).

*Typhlodromus (Trionus)* Denmark, 1992: 32 (synonym by Chant & McMurtry, 1994).

The species in the subgenus *Typhlodromus* are characterized by Chant & McMurtry, (1994, 2007): absence of seta S5; dorsal setal pattern 12A:7A; caudoventral setal patterns of females JV:ZV (the most common), with a total of 34 pairs of idiosomal setae, however, only *Typhlodromus (T.) leptodactylus* Wainstein has caudoventral setal pattern JV-3:ZV with a total of 33 pairs of idiosomal setae; dorsal setae z3, s6, J2, S2, S4, R1 and caudoventral setae JV2, JV4 and ZV3 present; dorsal setae z6, J1, Z1, Z3 and S5 absent; caudoventral setae JV3 present/absent; caudoventral setal pattern of the males JV-4:ZV-1,3 (the most common) and JV-4:ZV-3; dorsal setae relatively uniform in length; spermatheca with calyx cup-shaped or elongate, tubular; leg IV with at most one macroseta (on basitarsus); genu II with 6, 7 or 8 setae; chelicera of most species with few teeth [fixed digit of *T. (T.) griekwensis* Schultz, has 6 and the one of *T. (T.) neomagdalena* n. sp. has 7 teeth]; *T. (T.) leptodactylus* Wainstein has the palps elongate.

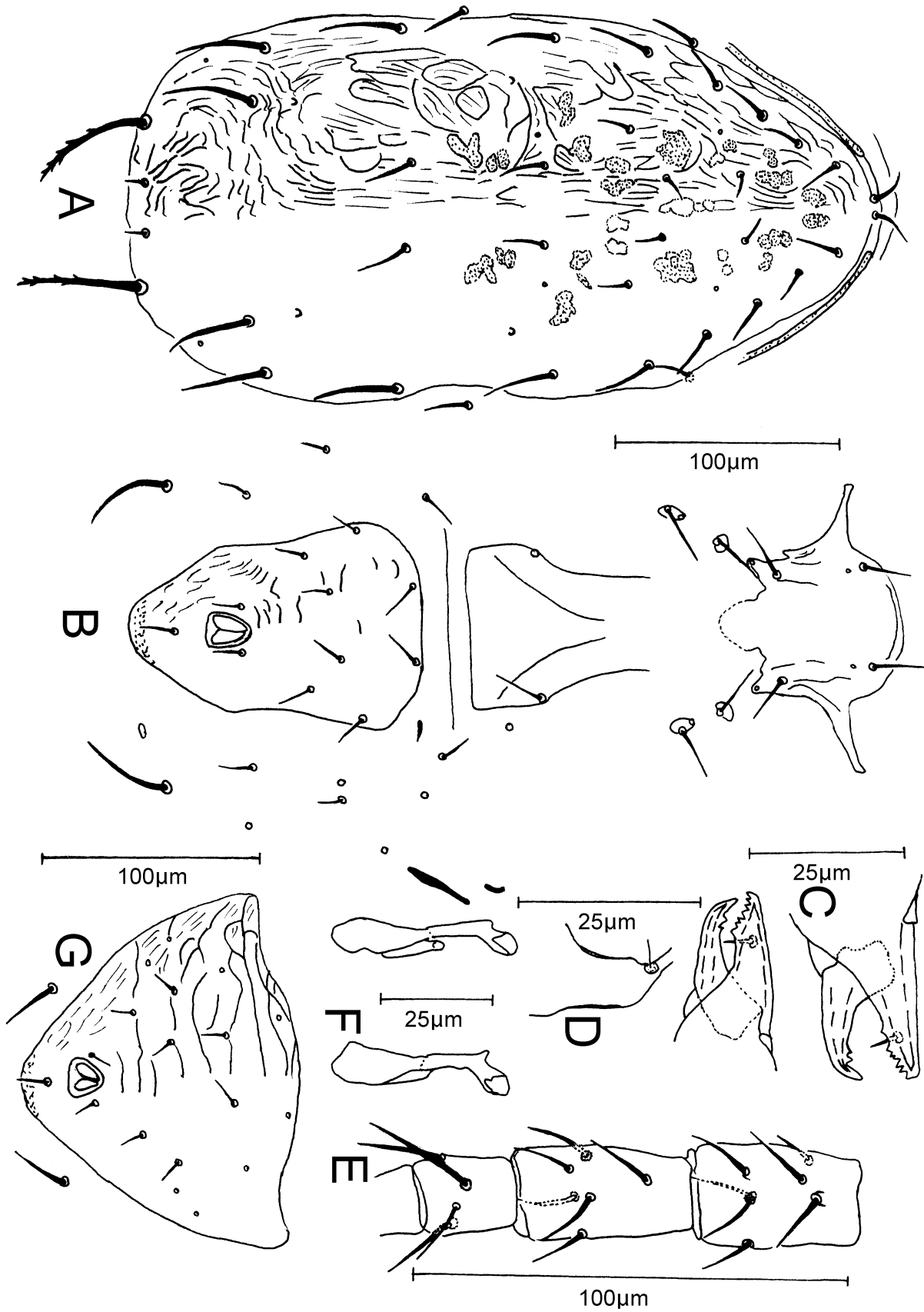
Three species of this genus are reported in this paper. Females of those species have idiosomal setae sharp-tipped; setae r3 and R1 inserted on integument; 3 pairs of sternal setae, except *T. (T.) griekwensis* which has 2 (ST3 inserted on separate shields); 4 pairs of pre-anal setae; a pair of pre-anal pores, except *T. (T.) griekwensis*, in which pre-anal pores are absent; 2 pairs of metapodal shields.

### ***Typhlodromus (Typhlodromus) griekwensis* Schultz**

(Fig. 54)

*Typhlodromus griekwensis* Schultz, 1973: 103.

*Typhlodromus (Typhlodromus) griekwensis*, Moraes *et al.*, 2004: 364; Chant & McMurtry, 2007: 157.



**FIGURE 54.** *Typhlodromus (Typhlodromus) griekwensis* Schultz: Female—A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV; Male—F. Spermatodactyl; G. Ventrianal shield.

FEMALE. (Specimens measured—Namibia: 1; South Africa: holotype, 1 paratype and 12 additional specimens). Idiosomal setal pattern 12A:7A/JV:ZV.

Dorsum. Dorsal shield 332 (315–354) [339] long and 176 (157–187) [178] wide, lightly reticulate. With 5 pairs of solenostomes, only gd4 not indicated in fig. 54A. Setae j1 18 (16–21) [19], j3 19 (16–23) [18], j4 12 (10–14) [12], j5 11 (9–14) [11], j6 17 (12–21) [15], J2 21 (18–24) [20], J5 9 (7–11) [8], z2 15 (13–19) [14], z3 18 (16–22) [20], z4 21 (15–25) [21], z5 14 (10–17) [13], Z4 35 (28–41) [36], Z5 48 (40–58) [47], s4 25 (22–29) [24], s6 26 (21–33) [25], S2 32 (26–37) [29], S4 36 (28–41) [35], r3 17 (15–19) [16], R1 18 (15–21) [18]. Setae smooth and sharp-tipped, except Z5, serrate.

Peritreme. Extending to level between j3 and j1.

Venter. Sternal shield smooth; posterior margin with a wedge-shaped median projection; distances between ST1–ST3 61 (56–66) [64], ST2–ST2 46 (42–51) [47]. Genital shield smooth; distance between ST5–ST5 55 (52–62) [53]. Ventrianal shield striate, pentagonal, with anterior margin straight, 118 (109–130) [118] long, 80 (67–92) [85] wide at level of ZV2, 66 (58–74) [68] wide at level of anus; elliptical pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Chelicera. Movable digit 23 (21–24) [23] long, with 2 teeth; fixed digit 22 (19–24) [22] long, with 6 teeth.

Spermatheca. Calyx short and broad, 11 (9–14) [10] long; atrium small.

Legs. Macroseta sharp-tipped; St IV 25 (20–29) [24]. Chaetotaxy: genu II: 2-2/0, 2/0-1 (2-2/1, 2/0-1 in paratype); genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—South Africa: 4)

Dorsum. Dorsal shield pattern and setae as in female, 256 (250–260) long and 157 (153–161) wide. Setae j1 16 (15–16), j3 14 (11–16), j4 9 (8–10), j5 10 (7–11), j6 11 (10–11), J2 13 (12–14), J5 9 (8–9), z2 11 (10–12), z3 12, z4 14 (13–14), z5 10 (9–11), Z4 26 (24–27), Z5 31 (30–33), s4 17 (15–18), s6 18 (16–19), S2 20 (18–23), S4 21 (18–26), r3 14 (12–16), R1 13 (12–13).

Peritreme. Extending to level of j3.

Venter. Ventrianal shield subtriangular, reticulate, free from peritrematal shields, 106 (105–107) long, 140 (138–144) wide at the anterior corners; with 4 pairs of pre-anal setae and 4 pairs of lyrifissures (1 anterior to JV1, 1 sublateral and almost transversally aligned with JV1, 1 anterolateral to ZV2, 1 lateral and transversally aligned with ZV2); elliptical pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Shaft straight for most of its length, bent distally, 21 (19–23) long.

Legs. Macroseta sharp-tipped; St IV 20 (19–21). Chaetotaxy of genua II and III as in female.

**Specimens examined. South Africa:** Holotype female, Northern Cape Province, Griekwastad, on *Rhus undulata*, 15-IX-1970, L. Smit; 1 paratype female, Northern Cape Province, Prieska, on *Lycium kraussii*, 16-IX-1970, M.K.P. Smith-Meyer; 1 female, Northern Cape Province, 10 km from Postmasburg to Shishen, on *Lycium cinereum*, 6-X-1979, E.A. Ueckermann; 1 male and 1 female, Northern Cape Province, 30 km from Calvinia to Williston, on *Pentzia incana*, 22-IX-1983, E.A. Ueckermann; 1 female, Northern Cape Province, Near Gariep Damm, Bethulie-road, on *Wahlenbergia virgata*, 3-III-1986, E.A. Ueckermann; 1 female, Eastern Cape Province, Mount Zebra Mountain National Park, on *Hermannia vestita*, 5-III-1986, M.K.P. Smith Meyer; 1 female and 2 males, Eastern Cape Province, Mount Zebra Mountain National Park, on *Pentzia punctata*, 6-III-1986, E.A. Ueckermann; 1 male, Eastern Cape Province, Mount Zebra Mountain National Park, on *Solanum tomentosum*, 6-III-1986, M.K.P. Smith Meyer; 1 female, Eastern Cape Province, Mount Zebra Mountain National Park, on an unidentified plant, 6-III-1986, M.K.P. Smith Meyer; 1 female, Western Cape Province, Karoo National Park near Beaufort-West, on *Rhus burchelli*, 22-09-1988, M.K.P. Smith Meyer; 1 female, Western Cape Province, Dwars River, Cederberg Mountains, on *Erica walkeria*, 11-IX-1991, E.A. Ueckermann; 1 female, Western Cape Province, Verlate Kloof Pass, Matjiesfontein-Sutherland road, on unknown plant, 3-IX-1991, E.A. Ueckermann; 1 female, Northern Cape Province, Cornellsberg Kloof north of Ersteenfontein Richtersveld, on *Aloe* sp., 7-IX-1992, S. Neser; 1 female, Western Cape Province, Piekerni-

erskloof, on *Dodonaea angustifolia*, 30-IX-1982, D.P. Keetch; 1 female, Western Cape Province, Piekernierskloof, on *Convolvulus capensis* var. *capensis*, 30-IX-1982, S. Cruickshank. **Namibia:** 1 female, Gobabeb, on *Wisteria* sp., 22-XI-1985, P.D. Theron.

**World distribution.** Namibia and South Africa.

### *Typhlodromus (Typhlodromus) magdalenae* Pritchard & Baker

(Fig. 55)

*Typhlodromus (Typhlodromus) magdalenae* Pritchard & Baker, 1962: 218; Moraes *et al.*, 2004: 365; Chant & McMurty, 2007: 157.

*Typhlodromus magdalenae*, Swirski & Ragusa, 1978: 408.

FEMALE. (Specimens measured—Burundi: 4; Kenya: 4; Rwanda: 4; Uganda: 2). Idiosomal setal pattern: 12A:7A/JV: ZV.

Dorsum. Dorsal shield 307 (274–328) long and 167 (130–184) wide, lightly reticulate. With 5 pairs of solenostomes, only gd4 not indicated in fig. 55A. Setae j1 21 (16–24), j3 42 (35–48), j4 23 (19–27), j5 46 (40–50), j6 54 (48–61), J2 62 (50–72), J5 8 (5–10), z2 20 (16–27), z3 50 (43–58), z4 23 (18–32), z5 24 (21–27), Z4 59 (43–66), Z5 62 (50–69), s4 56 (48–61), s6 64 (50–70), S2 65 (54–70), S4 62 (48–67), r3 29 (26–32), R1 27 (19–30). Setae serrate, except j1, j4, z5, smooth, and J5 and R1, sometimes smooth.

Peritreme. Extending to level between j1 and j3.

Venter. Sternal shield mostly smooth, with few lateral striae; posterior margin slightly concave; distances between ST1–ST3 58 (54–62), ST2–ST2 61 (53–64). Genital shield smooth; distance between ST5–ST5 55 (46–58). Ventrianal shield striate, pentagonal, with anterior margin straight, 104 (91–115) long, 70 (50–80) wide at level of ZV2, 61 (53–67) wide at level of anus; elliptical pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped, except JV5, serrate.

Chelicera. Movable digit 28 (27–29) long, with 2 teeth; fixed digit 25 (24–26) long, apparently with 4–5 teeth.

Spermatheca. Calyx variable, saccular to funnel-shaped, 18 (13–26) long, and 7 (5–10) in diameter at mid-length; atrium small and nodular.

Legs. Macrosetae sharp-tipped: Sge IV 21, Sti IV 24, St IV 35 (29–48). Chaetotaxy: genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

MALE. (Specimens measured—Uganda: 1)

Dorsum. Dorsal shield pattern and setae as in female, 240 long and 170 wide. Setae j1 17, j3 37, j4 21, j5 35, j6 43, J2 51, J5 6, z2 18, z3 43, z4 25, z5 19, Z4 49, Z5 51, s4 45, s6 50, S2 51, S4 51, r3 24, R1 30.

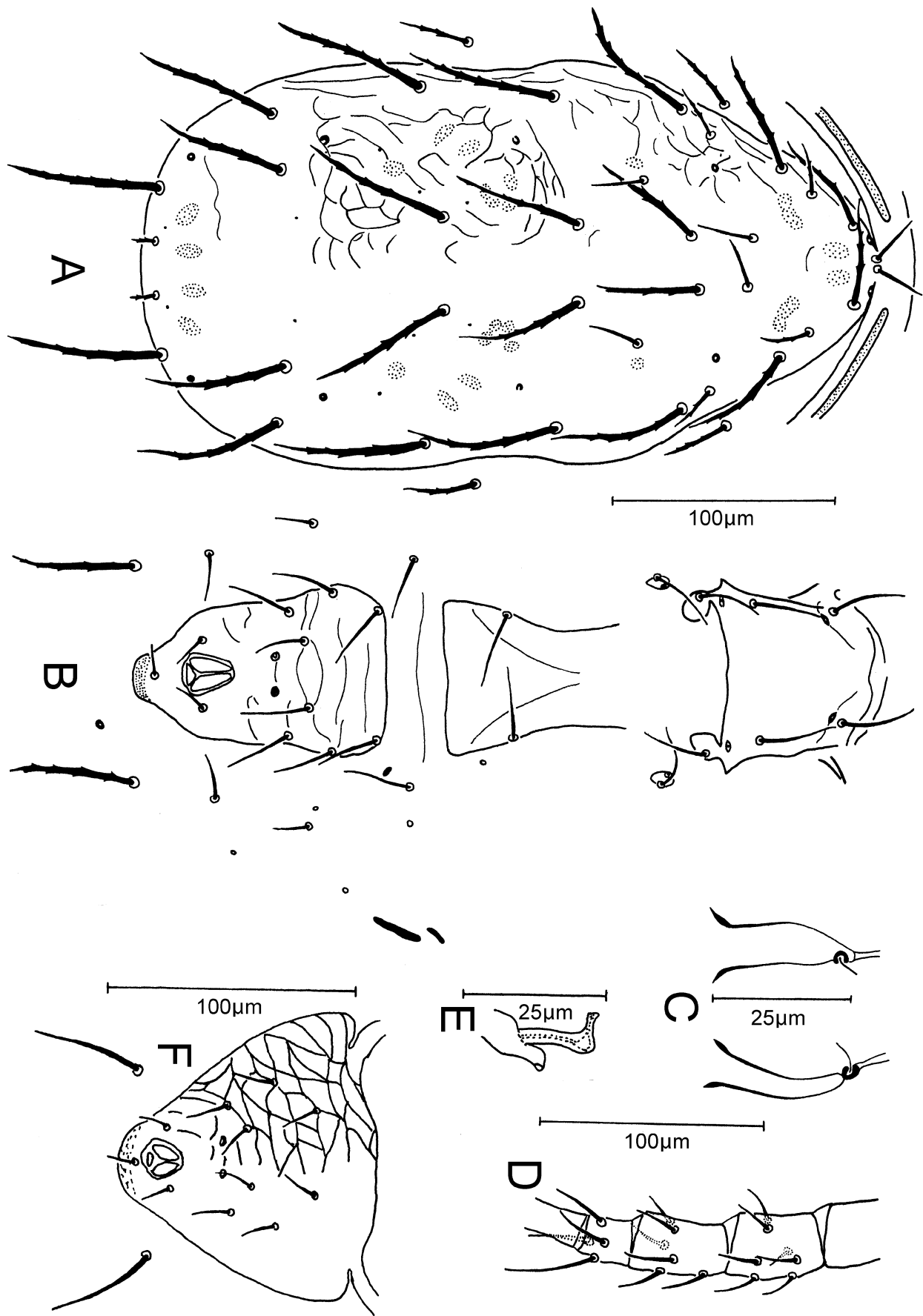
Peritreme. Extending to level of z3.

Venter. Ventrianal shield subtriangular, reticulate, fused with peritrematal shields, 104 long, 126 wide at the anterior corners; with 4 pairs of pre-anal setae and no distinguishable lyrifissures; elliptical pre-anal pores posteromesad of JV2. Caudoventral setae smooth and sharp-tipped.

Spermatodactyl. Shaft L-shaped, 13 long.

Legs. Macroseta sharp-tipped; St IV 29 (20–26). Chaetotaxy of genua II and III as in female.

**Specimens examined.** **Burundi:** 2 females, 5 km S Gitega, Province de Rutana, on *Ficus* sp., 13-XII-1989, J.S. Yaninek; 2 females, 16 km S Rutana, ISABU, Moso, Province de Rutana, on unknown plant, 13-XII-1989, J.S. Yaninek. **Kenya:** 2 females, 16 km W Maseno, Nyanza Province, on *Sida* sp., 2-XII-1989, J.S. Yaninek; 2 females, Kericho, Valley Province, on *Cassia* sp., 4-XII-1989, J.S. Yaninek. **Rwanda:** 1 female, ISAR Station, Rubosa, Prefecture de Butare, on *Ficus* sp., 6-XII-1989, J.S. Yaninek; 1 female, 53 km N Kibuye, Prefecture de Gisenyi, on *Ficus vallis*, 7-XII-1989, J.S. Yaninek; 1 female, ISAR Station, Karama, on *Grewia* sp., 9-XII-1989, J.S. Yaninek; 1 female, unknown location, on unknown plant, 9-XII-1989, J.S.



**FIGURE 55.** *Typhlodromus (Typhlodromus) magdalenae* Pritchard & Baker: Female—A. Dorsal shield; B. Ventral surface; C. Spermatheca; D. Leg IV; Male—E. Spermatodactyl; F. Ventrianal shield.



Yaninek. **Uganda:** 1 female, 31 km N Bushenyi, on *Ipomoea* sp., 7-X-1990, J.S. Yaninek; 1 female, 31 km N Bushenyi, on *Phyllanthus* sp., 7-X-1990, B. Odongo; 1 female and 1 male, Hoima town, on *Mangifera indica*, 11-X-1990, B. Odonis.

**Remarks.** Two of the specimens examined (1 from Rwanda and 1 from Uganda) are smaller than the others and have concurrently shorter dorsal setae, and J5 and R1 smooth; the one from Uganda is the smallest and has the shortest dorsal setae. Macrosetae are present on genu and tibia of leg IV of only 1 of the 4 specimens from Rwanda.

**World distribution.** Burundi, Democratic Republic of Congo, Kenya, Rwanda, South Africa and Uganda.

***Typhlodromus (Typhlodromus) neomagdalенаe* Zannou, Moraes & Oliveira, n. sp.**

(Fig. 56)

**Diagnosis.** Characterized by having dorsal shield strongly reticulate; most “lateral” setae and Z4 serrate, dorso-central (j4–J5) and marginal setae (r3 and R1) smooth, seta Z4 shorter than the distance between its base and that of Z5, j6 about half as long as the distance between its base and that of J2, and the latter about half as long as the distance between its base and that of Z4; sternal shield with median longitudinal striae; genital shield with longitudinal striae laterally; fixed cheliceral digit with 7 teeth.

FEMALE. (2 specimens measured). Idiosomal setal pattern: 12A:7A/JV:ZV.

Dorsum. Dorsal shield 308 (304–312) long and 169 (168–170) wide, strongly reticulate. With 5 pairs of solenostomes. Setae j1 20 (19–21), j3 30 (29–32), j4 17 (16–18), j5 20 (19–21), j6 25 (24–26), J2 38 (37–38), J5 8, z2 17 (16–18), z3 31 (30–32), z4 26 (24–27), z5 20 (19–21), Z4 40 (38–42), Z5 57 (56–58), s4 38 (37–38), s6 46 (45–48), S2 48, S4 51 (50–53), r3 26 (24–27), R1 21 (19–22). Setae j1, j4, j5, j6, J2, J5, z2, z4, z5, r3 and R1 smooth, other setae slightly to distinctly serrate.

Peritreme. Extending to level between j1 and j3.

Venter. Sternal shield with median longitudinal striae; posterior margin straight; distances between ST1–ST3 56, ST2–ST2 54. Genital shield with longitudinal striae laterally; distance between ST5–ST5 56. Ventrianal shield striate, pentagonal, with anterior margin straight, 111 (110–112) long, 82 (80–83) wide at level of ZV2, 67 (64–70) wide at level of anus; round pre-anal pores posterior to and almost vertically aligned with JV2. Caudoventral setae smooth and sharp-tipped, except, JV5, serrate.

Chelicera. Movable digit 26 (25–26) long, with 2 teeth; fixed digit 23 (22–24) long, with 7 teeth.

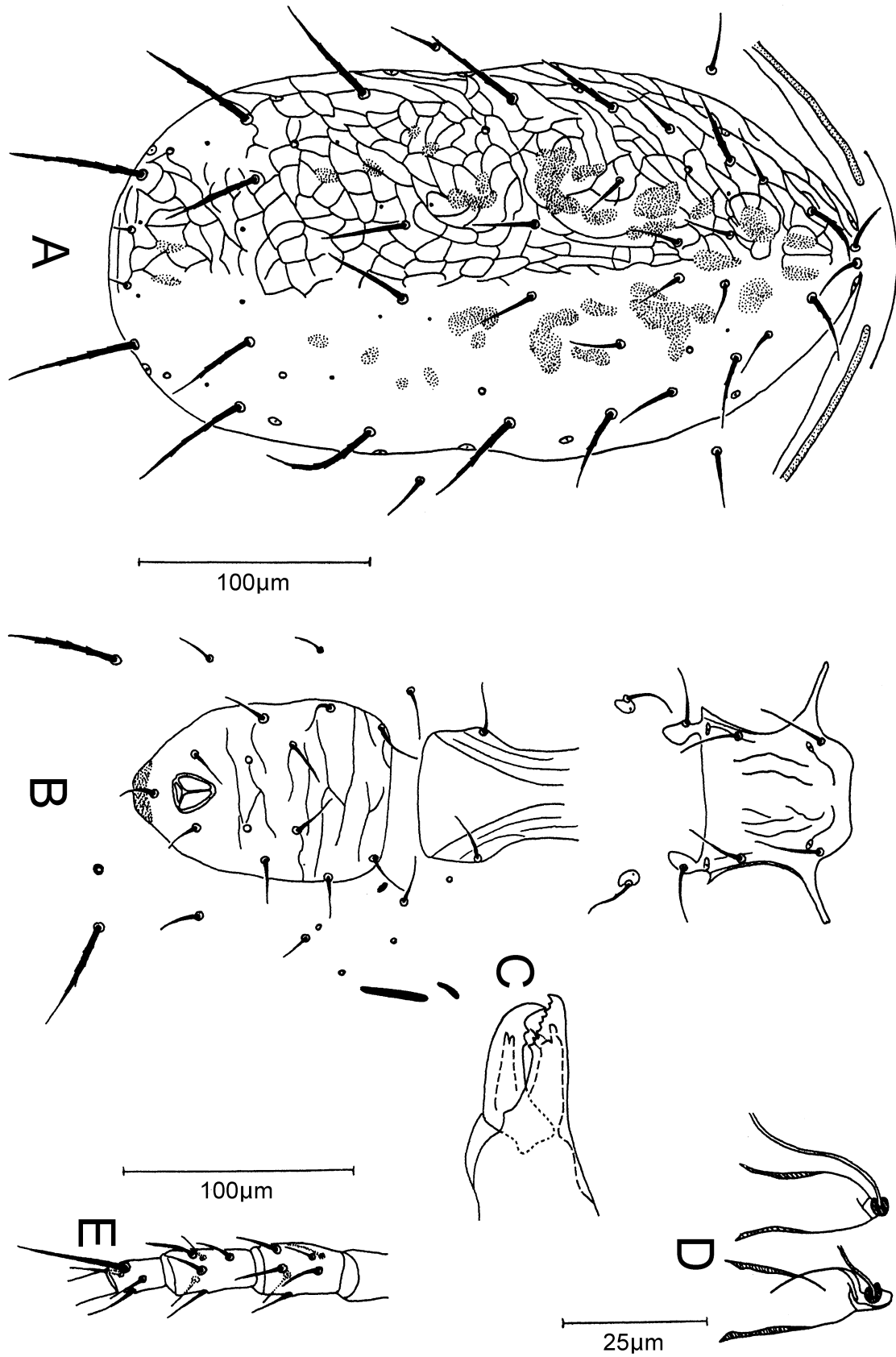
Spermatheca. Calyx saccular, 21 long, and 11 (10–11) in diameter at mid-length; atrium small and nodular.

Legs. Macrosetae sharp-tipped: Sge IV 21, Sti IV 26, St IV 50; macrosetae are present on genu and tibia of leg IV in one of the two specimens examined. Chaetotaxy: genu II: 2-2/0, 2/0- 1; genu III: 1-2/1, 2/0-1.

**Locality and type material.** Holotype female and one paratype female from *Ipomoea* sp., 74 km N Kibuye, Prefecture de Gisenyi, Rwanda, 7-XII-1989, J.S. Yaninek, deposited at ESALQ-USP.

**Etymology.** The name *neomagdalенаe* refers to the similarity between this species and *T. (T) magdalенаe*.

**Remarks.** *Typhlodromus (T.) magdalенаe* differs from this new species by having seta Z4 longer than the distance between its base and that of Z5; j6 about as long as the distance between its base and that of J2, and the latter at least 0.9 times as long as the distance between its base and that of Z4; sternal shield mostly smooth, with few lateral striae; genital shield smooth.



**FIGURE 56.** *Typhlodromus (Typhlodromus) neomagdalенаe* Zannou, Moraes & Oliveira, **n. sp.** (female): A. Dorsal shield; B. Ventral surface; C. Chelicera; D. Spermatheca; E. Leg IV.

## Key to subgenera and species of the tribe Typhlodromini treated in this paper

1. Seta S5 present..... subgenus *Anthoseius* De Leon...2
- Seta S5 absent..... subgenus *Typhlodromus* Scheuten...3
2. Seta JV1 off or closely associated with anterior margin of ventrianal shield.....  
..... *T. (A.) daresaalami* El-Banhawy & Abou-Awad
- Seta JV1 on ventrianal shield, if not then ventrianal quadrate ..... 3
3. Ventrianal shield with 3 pairs of pre-anal setae ..... 4
- Ventrianal with 4 pairs of pre-anal setae..... 8
4. All dorsal setae (except J5) and JV5 lanceolate ..... *T. (A.) grewiae* Zannou, Moraes & Oliveira, **n. sp.**
- Dorsal setae and JV5 not as above..... 5
5. Dorsal shield with a pair of profound incisions at level of R1; all dorsal setae and JV5 smooth, sharp-tipped ..... *T. (A.) eremicus* Smith Meyer & Ueckermann
- Dorsal shield without a pair of profound incisions at level of R1; most of dorsal setae and JV5 serrate, knobbed..... 6
6. Most of dorsal setae shorter than distance between their bases and bases of setae next behind; ventrianal shield with scarce transverse striae; genu of leg II with 8 setae..... *T. (A.) transvaalensis* (Nesbitt)
- Most of dorsal setae longer than distance between their bases and bases of setae next behind; ventrianal shield reticulate; genu of leg II with 7 setae ..... 7
7. Anterior half of dorsal shield distinctly narrower than posterior half; seta r3 inserted on integument; sternal and genital shields reticulate; SgeIII absent. ....  
..... *T. (A.) neohartlandrowei* Zannou, Moraes & Oliveira, **n. sp.**
- Anterior half of dorsal shield about as wide as posterior half; seta r3 inserted on dorsal shield; sternal and genital shields smooth; SgeIII present..... *T. (A.) hartlandrowei* Evans
8. Dorsal shield with at least 10 pairs of serrate setae ..... 9
- Dorsal shield with at most 5 pairs of serrate setae..... 14
9. Setae j4–j6 and z5 smooth ..... 10
- Setae j4–j6 and z5 serrate. .... 11
10. Setae Z4, S4 and S5 knobbed; setae z2–z4 serrate ..... *T. (A.) grastis* Ueckermann & Loots
- Setae Z4, S4 and S5 sharp-tipped; setae z2–z4 smooth.....  
..... *T. (A.) neoterrulentis* Zannou, Moraes & Oliveira, **n. sp.**
11. Seta z2 inserted slightly closer to j3 than z3; ventrianal shield pentagonal, with lateral margins concave ..  
..... *T. (A.) kenya* Zannou, Moraes & Oliveira, **n. sp.**
- Seta z2 inserted mid-way between j3 and z3; ventrianal shield subquadrate, with lateral margins almost straight ..... 12
12. Calyx of spermatheca swollen near atrium, then narrows but flared next to vesicle, about 3 times as long as wide. .... *T. (A.) neomichaeli* Zannou, Moraes & Oliveira, **n. sp.**
- Calyx of spermatheca not as above, at most 1.25 times as long as wide..... 13
13. All dorsal setae slightly serrate; seta ST3 inserted on integument; calyx of spermatheca saccular, with lateral margins constricted next to vesicle..... *T. (A.) combretum* McMurtry & Moraes
- Dorsal setae strongly serrate, except J5, smooth; seta ST3 inserted on sternal shield; calyx of spermatheca bell-shaped, with lateral margins straight..... *T. (A.) michaeli* Ueckermann & Loots
14. Setae S4 and/or S5 serrate ..... 15
- Both setae S4 and S5 smooth..... 17
15. Setae S4 and S5 serrate; seta Z4 knobbed..... *T. (A.) terrulentis* Van der Merwe
- Seta S4 or S5 smooth; seta Z4 sharp-tipped ..... 16
16. Setae S4 stout and strongly serrate, seta S5 smooth; calyx of spermatheca saccular, narrowing only

slightly next to atrium.....	<i>T. (A.) asperosetosus</i> Zannou, Moraes & Oliveira, <b>n. sp.</b>	
- Setae S4 slender and smooth, seta S5 serrate; calyx of spermatheca with a distinct slender portion next to atrium.....	<i>T. (A.) matthyssei</i> Ueckermann & Loots	
17. Most dorsal setae distinctly knobbed.....		18
- Most dorsal setae distinctly blunt or sharp-tipped.....		19
18. Seta z3 absent; setae j4–j6 knobbed.....	<i>T. (A.) cephalochaitosus</i> Moraes, Oliveira & Zannou	
- Seta z3 present; setae j4–j6 sharp-tipped.....	<i>T. (A.) ghanaensis</i> Zannou, Moraes & Oliveira, <b>n. sp.</b>	
19. Most dorsal setae blunt; setae Z4 and Z5 spatulate; anal orifice located at center of ventrianal shield.....		
.....	<i>T. (A.) religiosus</i> Ueckermann & Loots	
- Most dorsal setae sharp-tipped; setae Z4 and Z5 not spatulate; anal orifice located at posterior region of ventrianal shield.....		20
20. Setae S4, S5 and r3 knobbed.....	<i>T. (A.) bullatus</i> van der Merwe	
- Setae S4, S5 and r3 sharp-tipped.....		21
21. Seta Z4 at least 1.3 times as long as distance between its base and that of S5.....		22
- Seta Z4 at most 1.1 times as long as distance between its base and that of S5.....		31
22. Genu of leg II with 7 setae.....		23
- Genu of leg II with 8 setae.....		26
23. Seta JV5 knobbed.....	<i>T. (A.) malawiensis</i> Zannou, Moraes & Hanna	
- Seta JV5 sharp-tipped.....		24
24. Seta Z5 knobbed; Sti IV present.....	<i>T. (A.) buccalis</i> Van der Merwe	
- Seta Z5 sharp-tipped, Sti IV absent.....		25
25. Seta Z4 as long as distance between its base and base of Z5; calyx of spermatheca funnel-shaped; St IV sharp-tipped.....	<i>T. (A.) bergi</i> Moraes & McMurtry	
- Seta Z4 distinctly shorter than distance between its base and base of Z5; calyx of spermatheca bell-shaped; St IV knobbed.....	<i>T. (A.) capparidis</i> Van der Merwe	
26. Seta S5 at most 0.4 times as long as S4.....		27
- Seta S5 at least 0.7 times as long as S4.....		29
27. Seta Z5 not inserted on tubercle; seta ST3 off sternal shield; fixed and movable cheliceral digits with 4–5 and 3 teeth, respectively.....	<i>T. (A.) praeacutus</i> Van der Merwe	
- Seta Z5 inserted on distinct pronounced tubercle; seta ST3 on sternal shield; fixed and movable cheliceral digits with at most 1 tooth each.....		28
28. Seta j4 shorter than distance between its base and that of j5, seta z2 about 0.7 times as long as j3, setae Z4 and S5 inserted on tubercles, atrium of spermatheca bulbous.....	<i>T. (A.) sudanicus</i> El-Badry	
- Seta j4 as long as distance between its base and that of j5, seta z2 about 0.9 times as long as j3, setae Z4 and S5 not inserted on tubercles, atrium of spermatheca not bulbous.....	<i>T. (A.) balanites</i> El-Badry	
29. Calyx of spermatheca bulged next to atrium, followed by a slender tube that flares toward the vesicle.....		
.....	<i>T. (A.) astibus</i> Ueckermann & Loots	
- Calyx of spermatheca not as above.....		30
30. Setae j6 and J2 at most 0.4 times as long as distance between their bases and bases of the setae next behind; seta Z4 smooth; pre-anal pores absent; movable digit of chelicera with 1 tooth.....		
.....	<i>T. (A.) lootsi</i> Schultz	
- Setae j6 and J2 at least 0.7 times as long as distance between their bases and bases of setae next behind; seta Z4 serrate; pre-anal pores present; movable digit of chelicera with 3 teeth.....		
.....	<i>T. (A.) kikuyuensis</i> Swirski & Ragusa	
31. Pre-anal pores absent.....		32
- Pre-anal pores present.....		34
32. Proximal half of calyx of spermatheca slightly bulged and thick walled, posterior half thin walled and		

- slightly flared toward vesicle; Sge IV and Sti IV present.....*T. (A.) argyronamus* Ueckermann & Loots
- Calyx of spermatheca bell-shaped; Sge IV and Sti IV absent ..... 33
  - 33. Seta Z4 about half as long as distance between its base and base of S5; seta ST3 inserted on separate shields; St IV knobbed..... *T. (A.) namaquaensis* Ueckermann & Loots
  - Seta Z4 about 0.9 times as long as distance between its base and base of S5; seta ST3 inserted on integument; StIV sharp-tipped or blunt ..... *T. (A.) wernerii* Schultz
  - 34. Spermatheca with atrium bulbous, much wider than slender section of calyx next to it.....  
..... *T. (A.) subtilis* Zannou, Moraes & Oliveira, **n. sp.**
  - Spermatheca different ..... 35
  - 35. Calyx of spermatheca more than 50 times as long as width at its mid-length.....  
..... *T. (A.) muliebris* Van der Merwe
  - Calyx of spermatheca less than 10 times as long as width at its mid-length..... 36
  - 36. Leg IV with at least 2 knobbed setae in addition to macrosetae..... 37
  - Leg IV without knobbed setae in addition to macrosetae..... 40
  - 37. Sge IV present..... 38
  - Sge IV absent..... 39
  - 38. Seta Z4 sharp-tipped; ventrianal shield longer than wide, with lateral margins constricted; Sge III absent.  
..... *T. (A.) crassus* Van der Merwe
  - Seta Z4 knobbed; ventrianal shield as long as wide, with lateral margins almost straight; Sge III present..  
..... *T. (A.) elaeis* Zannou, Moraes & Oliveira, **n. sp.**
  - 39. Calyx of spermatheca tubular; atrium distinct, about as wide as calyx.....  
..... *T. (A.) constrictus* Zannou, Moraes & Oliveira **n. sp.**
  - Calyx of spermatheca funnel-shaped; atrium indistinct, distinctly narrower than calyx.....  
..... *T. (A.) lobatus* Zannou, Moraes & Oliveira, **n. sp.**
  - 40. Sge IV present and Sti IV present/ absent ..... 41
  - Sge IV and Sti IV absent..... 49
  - 41. Seta S2 about 0.8 as long as distance between its base and base of S4, Sti IV absent .....  
..... *T. (A.) rasilis* Van der Merwe
  - Seta S2 at most 0.6 as long as distance between its base and base of S4, Sti IV present..... 42
  - 42. Sge III and StiIII present; posterior margin of sternal shield straight or slightly concave ..... 43
  - SgeIII and Sti III absent; posterior margin of sternal shield with a median lobe or indistinct ..... 44
  - 43. Calyx of spermatheca funnel-shaped..... *T. (A.) ndibu* Pritchard & Baker
  - Calyx of spermatheca saccular ..... *T. (A.) neogutierrezii* Zannou, Moraes & Oliveira, **n. sp.**
  - 44. Seta S5 at most 0.4 times as long as S4, sternal shield with 3 pairs of setae (ST3 on shield)..... 45
  - Seta S5 at least 0.6 times as long as S4, sternal shield with 2 pairs of setae (ST3 inserted on membrane)..  
..... 46
  - 45. Calyx of spermatheca about 4 times as long as width at its mid-length; with 5 teeth about equally spaced along internal margin of fixed digit..... *T. (A.) vescus* Van der Merwe
  - Calyx of spermatheca about 10 times as long as width at its mid-length; fixed digit of chelicera with 6 teeth, all distal..... *T. (A.) acaciae* Schultz
  - 46. Calyx of spermatheca cup-shaped, at most twice as long as width at its mid-length..... 47
  - Calyx of spermatheca tubular, at least 4 times as long as width at its mid-length ..... 48
  - 47. Seta Z4 serrate, about as long as distance between its base and that of S4 .....  
..... *T. (A.) drymis* Ueckermann & Loots
  - Seta Z4 smooth, about half as long as distance between its base and that of S4.....  
..... *T. (A.) umbraculus* Ueckermann & Loots
  - 48. Seta Z4 as long as distance between its base and that of S5; seta S2 0.9 times as long as distance between

- its base and that of S4..... *T. (A.) totifolianensis* El-Banhawy & Abou-Awad
- Seta Z4 about 0.6 times as long as distance between its base and that of S5; seta S2 about 0.4 times as long as distance between its base and that of S4 ..... *T. (A.) paganus* Van der Merwe
  - 49. Calyx of spermatheca at least 6 times as long as width at its mid-length..... 50
  - Calyx of spermatheca at most 3 times as long as width at its mid-length ..... 51
  - 50. Seta Z4 knobbed ..... *T. (A.) celastrus* Ueckermann & Loots
  - Seta Z4 sharp-tipped..... *T. (A.) gardeniae* Schultz
  - 51. Setae J2, R1 and most of lateral setae inserted on tubercles; most of setae of leg IV inserted on tubercles. .... *T. (A.) februs* Van der Merwe
  - Setae J2, R1 and most of lateral setae not inserted on tubercles; most or all setae of leg IV not inserted on tubercles ..... 52
  - 52. Ventrianal shield reticulate..... 53
  - Ventrianal shield mostly smooth, with at most a very few median striae between pre-anal pores and anus ..... 55
  - 53. Dorsal shield mostly smooth, with anterolateral striae; sternal shield with 3 pairs of setae (ST3 on shield) ..... *T. (A.) asticus* El-Banhawy & Abou-Awad
  - Dorsal shield strongly reticulate; sternal shield with 2 pairs of setae (ST3 on separate shields) ..... 54
  - 54. Seta JV5 knobbed; tibia of leg IV with 6 or 7 setae ..... *T. (A.) johanna* Ueckermann & Loots
  - Seta JV5 sharp-tipped; tibia of leg IV with 6 setae ..... *T. (A.) auratus* Ueckermann & Loots
  - 55. Genu of leg III with 6 setae. .... *T. (A.) apoxys* Van der Merwe
  - Genu of leg III with 7 setae ..... 56
  - 56. Fixed digit of chelicera with 2 teeth; genu of leg II with 8 setae ..... *T. (A.) incisivus* Van der Merwe
  - Fixed digit of chelicera with 4–6 teeth; genu of leg II with 7 setae ..... 57
  - 57. Seta S5 about as long as S4 ..... 58
  - Seta S5 at most 0.7 as long as S4..... 59
  - 58. Seta Z4 serrate; St IV knobbed..... *T. (A.) microbullatus* Van der Merwe
  - Seta Z4 smooth; St IV sharp-tipped..... *T. (A.) saevus* Van der Merwe
  - 59. Seta Z4 at least as long as distance between its base and that of S5 ..... 60
  - Seta Z4 at most 0.8 times as long as distance between its base and that of S5 ..... 61
  - 60. Seta Z5 knobbed, seta S5 about 0.7 times as long as S4 ..... *T. (A.) persianus* McMurtry
  - Seta Z5 sharp-tipped, seta S5 about 0.5 times as long as S4..... *T. (A.) theroni* Ueckermann & Loots
  - 61. Setae Z5 and St IV sharp-tipped..... *T. (A.) galpinii* Ueckermann, Zannou & Moraes, **n. sp.**
  - Setae Z5 and St IV knobbed ..... 62
  - 62. Seta Z4 1.2 times as long as distance between its base and base of S4; ST3 on sternal shield..... *T. (A.) denheyeri* Zannou, Moraes & Oliveira, **n. sp.**
  - Seta Z4 0.7 times as long as distance between its base and base of S4; ST3 off sternal shield ..... *T. (A.) wrenschae* Ueckermann & Loots
  - 63. Sternal shield with 2 pairs of setae (ST3 on separate shields), pre-anal pores absent..... *T. (T.) griekwensis* Schultz
  - Sternal shield with 3 pairs of setae (ST3 on this shield), pre-anal pores present ..... 64
  - 64. Seta Z4 shorter than distance between its base and that of Z5, j6 about half as long as distance between its base and that of J2 and latter about half as long as distance between its base and that of Z4; sternal and genital shields with longitudinal or diagonal striae. .... *T. (T.) neomagdalenae* Zannou, Moraes & Oliveira, **n. sp.**
  - Seta Z4 longer than distance between its base and that of Z5; j6 about as long as distance between its base and that of J2 and latter about 0.9 times as long as distance between its base and that of Z4; sternal shield mostly smooth, at most with few lateral longitudinal striae; genital shield smooth..... *T. (T.) magdalenae* Pritchard & Baker

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