

TWO NEW *TYPHLODROMUS* FROM AUSTRALIA AND *T. CAUDIGLANS* SCHUSTER REDESCRIBED (ACARI : PHYTOSEIIDAE)

BY

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ABSTRACT

Immature and adult stages of *Typhlodromus dossei* sp. n. from *Ficus carica* and other host plants and *Typhlodromus brisbanensis* sp. n. from strawberry in Australia are described and illustrated. The two new species are closely related to each other and to *T. (A.) saevus* Van der Merwe and *T. caudiglans* Schuster. The latter is redescribed from three paratype females and one paratype male.

ZUSAMMENFASSUNG

Junge und adulte Stadien von *Typhlodromus dossei* nov. spec. von *Ficus carica* Bäumen und anderen Pflanzen, sowie das Weibchen von *Typhlodromus brisbanensis* nov. spec. von Erdbeerpflanzen in Australien werden beschrieben und illustriert. Die zwei neuen Arten sind nahe miteinander verwandt ; sie sind auch (*T. (A.) saevus* Van der Merwe und *T. caudiglans* Schuster ähnlich. Die letztere Art wird erneut an Hand von drei Paratyp-Weibchen und einem Paratyp-Männchen beschrieben.

INTRODUCTION

Large numbers of all developmental stages of *Typhlodromus dossei* sp. n. were collected from a *Ficus carica* tree in a Backyard at Ryde (Sydney) in 1972, where they were feeding on colonies of eriophyid mites on the underside of leaves. The eriophyid mites were causing the leaves to form large blisters. In the laboratory the new species was reared on excised ficus leaf discs in modified Huffaker cells with eriophyid mites as food. In recent years additional specimens of *T. dossei* were received from other host plants from many different areas of Australia (see material examined). In one case it was misidentified as *T. caudiglans*. The latter species is redescribed here to allow comparison between it and *T. dossei*.

T. brisbanensis sp. n. was collected from unsprayed strawberry plants in Queensland during experiments on the integrated control of strawberry mites.

The following abbreviations of museums and collections are used : CAS California Academy of Sciences, Davis ; PPRI Plant Protection Research Institute, Pretoria ; BCRI Biological and Chemical Research Institute, Rydalmere.

The terminology used for adult females and males is indicated in Fig. 15. The system of setal nomenclature for dorsal and ventral shields of the immature stages is that adopted by Chant

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Acarologia, t. XX, fasc. 3, 1978.

(1958). If not indicated otherwise, three specimens were measured of each of the developmental stages of *T. dossei*, values being the range in micrometres. Of *T. caudiglans* three paratype females and one paratype male were measured. Schuster's measurements of the holotype follow in brackets.

Genus Typhlodromus Scheuten

Typhlodromus Scheuten, 1857 : 111. Type-species by subsequent designation of Oudemans (1929) : *Typhlodromus pyri* Scheuten, 1857.

***Typhlodromus dossei* sp. n. (Figs. 1-14)**

Types. — NEW SOUTH WALES : on leaves of *Ficus carica*, Ryde, Jan. 1972, E. Schicha. *Holotype* ♀ (T.do.1), six *paratype* ♀♀ (T.do.2-7) and four *paratype* ♂♂ (T.do.8-11) in BCRI.

Other specimens examined. — NEW SOUTH WALES : two ♀♀, one ♀ deutonymph, one ♂ deutonymph, seven protonymphs, two larvae, same collection data as types. Two ♀♀, on apple leaves, Arcadia, 8.v.1973, P. Walters. Two ♀♀, three ♂♂, on *Banksia integrifolia*, Sydney, September 1973, E. Schicha. One ♀, on *Eupatorium* sp., Woolwich, 5.xi.1975, E. Schicha. Two ♀♀, one ♂, on *Banksia integrifolia*, in association with eriophyid mites causing extensive galls, 11.v.1977, A. L. Bertus. QUEENSLAND : two ♀♀, on grapes, Severnlea, June 1966, R. A. McLachlan. Two ♀♀, on apple, Stanthorpe, 23.ii.1973, B. F. Ingram. VICTORIA : one ♀, on apple, Red Hill, 7.iii.1977, D. S. Morris. One ♀, on apple leaves, 9.iii.1977, T. Nasquelle. One ♀, on apples, Hoddles Creek, 11.v.1977, D. S. Morris. One ♀, on apples, Bacchus Marsh, 14.vi.1977, D. S. Morris. TASMANIA : two ♀♀, under bud scales of blackcurrant, Snug, 29.vii.1974, M. Williams. Two ♀♀, under bud scales of blackcurrant, Lachlan, 29.vii.1977, M. Williams. One ♀, one ♂, under bud scales of blackcurrant, Molesworth, 29.vii.1977, M. Williams. All specimens in BCRI.

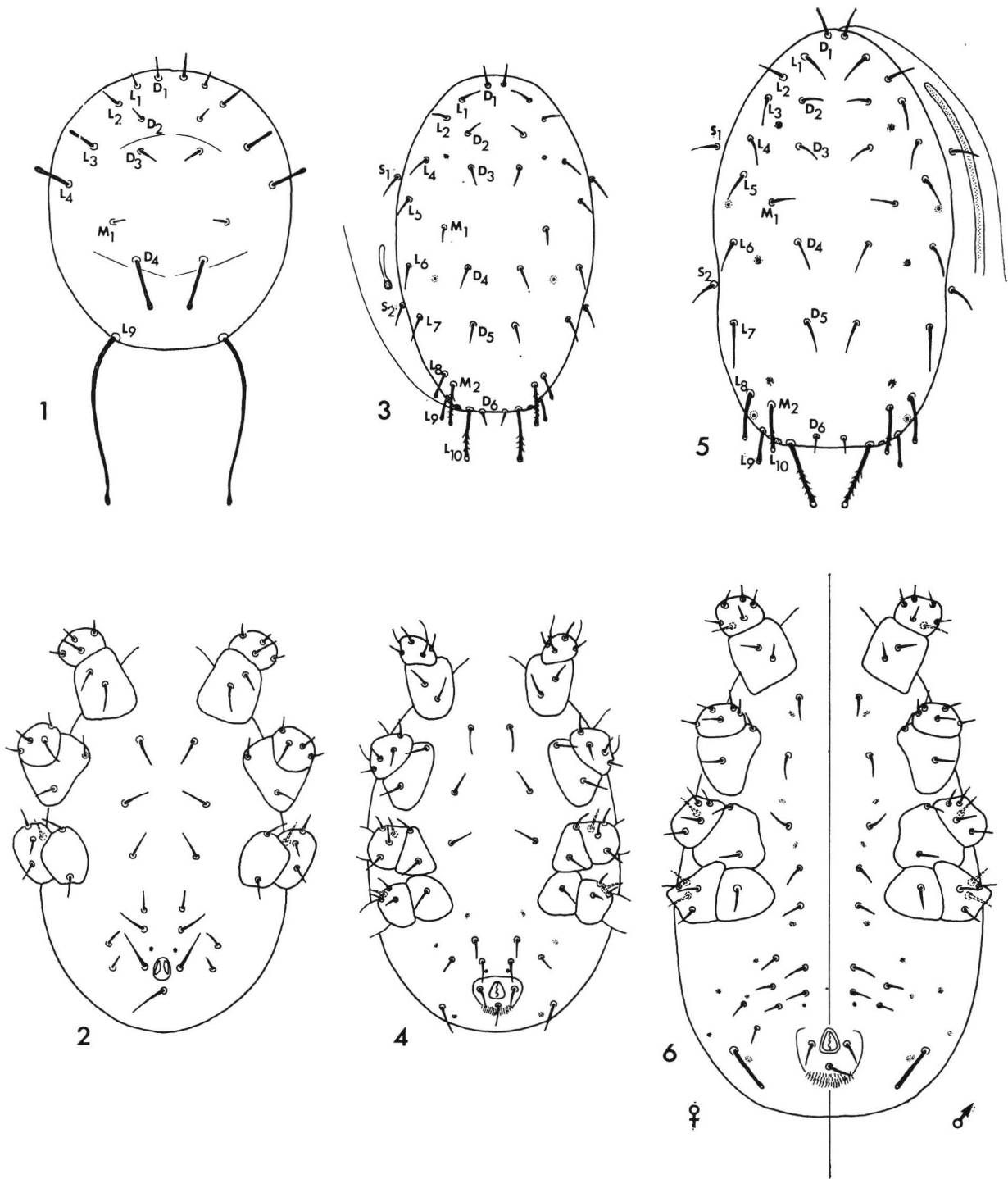
LARVA (Figs 1-2)

Dorsum. — Smooth idiosoma 188 long, 99-110 wide at L4. Ten pairs of smooth setae, four dorsal, one median, four prolateral, one caudolateral : D1 7-9 long, D2 4-6, D3 5-7, D4 21-23, M1 6-9, L1 4-7, L2 7-9, L3 11-12, L4 12-13, L9 88-92. D4, L4 and L9 knobbed, L3 blunt. All setae shorter than distances between their bases and those of setae following next in series (Fig. 1).

Venter. — Two pairs of preanal setae and two pairs of lateroventral setae short ; three paranal setae long. Very small preanal pores 12-14 apart (Fig. 2).

PROTONYMPH (Figs 3-4)

Dorsum. — Idiosoma 194-209 long, 107-136 wide at L4. 17 pairs of setae, six dorsal, two median, nine lateral : D1 11-12 long, D2 8-10, D3 8-9, D4 13-15, D5 14-15, D6 8-9, M1 9-11, M2 21-25, L1 and L2 10-12, L3 missing, L4 11-12, L5 13-15, L6 14-15, L7 and L8 17-19, L9 14-17, L10 24-31. M2 and L10 serrated and knobbed. All other setae smooth ; L8 and L9 terminating with a knob. All setae shorter than distances between their bases and those of setae following



FIGS 1-6. — *Typhlodromus dossei* sp. n.

(1-2) LARVA : 1) dorsum ; 2) venter.

(3-4) PROTONYMPH : 3) dorsum ; 4) venter. (5-6) deutonymph : 5) dorsum ; 6) venter.

next in series. Three pairs of pores as figured. S1 15-17 and S2 14-15, on interscutal membrane. Peritremes 28-30 long (Fig 3).

Venter. — Two pairs of preanal setae, one pair of lateroventral setae, one pair of caudolateral setae, and three para-anal setae all of near equal length and short. Preanal pores 12-13 apart (Fig. 4).

Legs. — Basitarsus IV with knobbed macroseta 21-25 long.

DEUTONYMPH (Figs 5-6)

Female (one specimen measured)

Dorsum. — Imbricated idiosoma 245 long, 91 wide at L4, with rugose muscle insertions and 18 pairs of setae, six dorsal, two median, six prolateral, four postlateral : D1 16 long, D2 and D3 10, D4 14, D5 17, D6 7, M1 13, M2 26, L1 16, L2 and L3 14, L4 and L5 16, L6 20, L7 and L8 24, L9 23, L10 33, S1 22, S2 19. L1 as long as interspace L1/L2 ; L2 as long as interspace L2/L3. L8 and L9 longer than distances between their bases and those of setae following next in series ; all other setae shorter than distances between their bases and those of next following setae. M2 and L10 serrated and knobbed ; all other setae smooth ; L8 and L9 terminating with a knob. Six pairs of pores as figured. S1 15 and S2 14 on interscutal membrane. Peritremes extending forward to L2 (Fig. 5).

Venter. — Five pairs of preanal setae, two pairs of lateroventral setae, and 3 para-anal setae all of near equal length and short ; one pair of caudolateral setae long and knobbed. Preanal pores 22 apart (Fig. 6).

Legs. — Basitarsus IV with knobbed macroseta 29 long.

Male (one specimen measured).

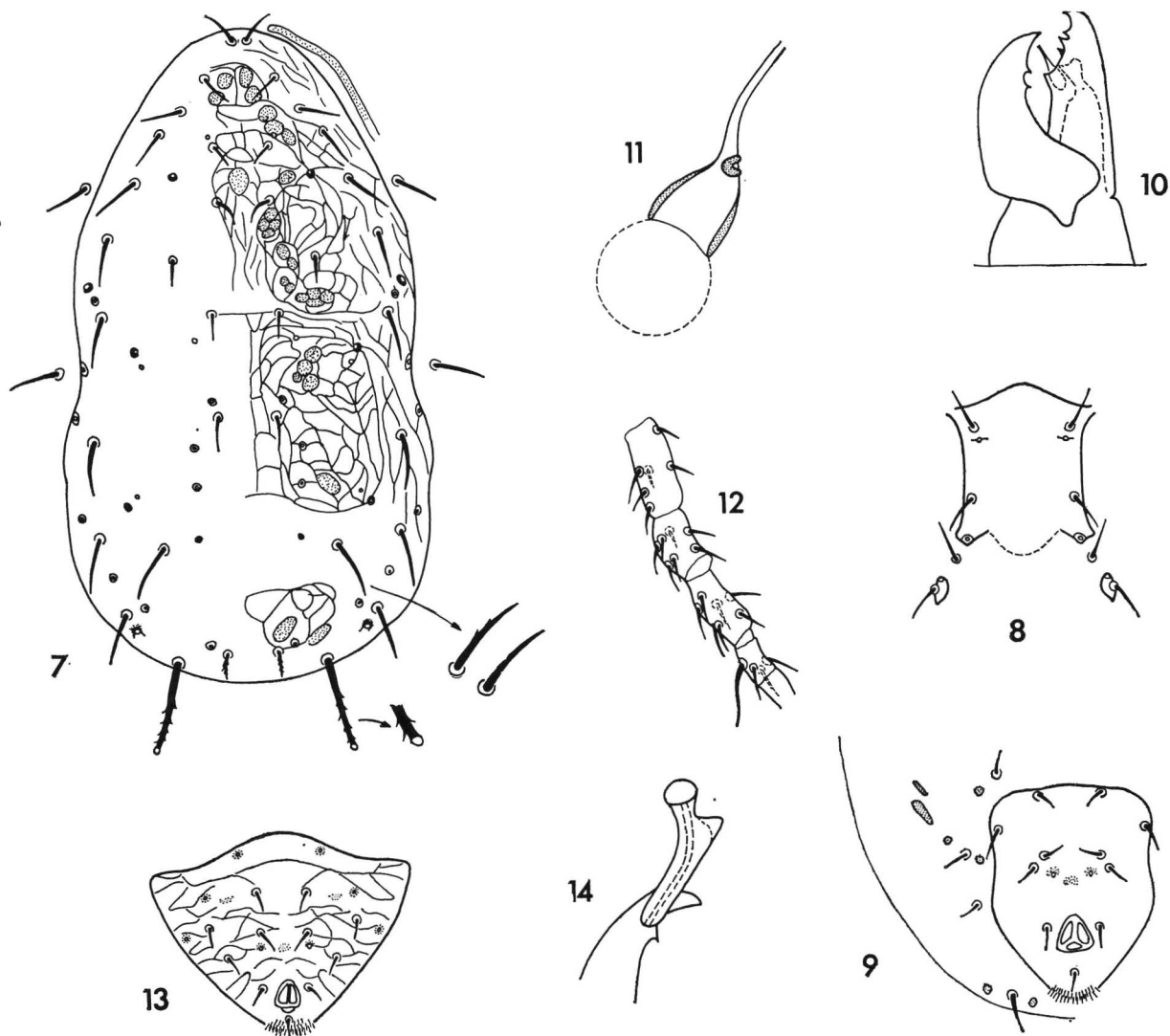
Dorsum. — Idiosoma 218 long, 87 wide at L4. Chaetotaxy resembling that of female deutonymph, but setae shorter ; D1 13 long, D2 7, D3 and D4 9, D5 11, D6 7, M1 9, M2 17, L1 12, L2 10, L3 9, L4 11, L5 10, L6 14, L7 15, L8 16, L9 14, L10 27, S1 15, S2 14.

Venter. — Similar to female deutonymph but with only four pairs of preanal setae and no lateroventral setae. Preanal pores 14 apart (Fig. 6).

Legs. — Basitarsus IV with knobbed macroseta 21 long.

FEMALE (Figs 7-12)

Dorsum. — Imbricated idiosoma 286-303 long, 130-141 wide at L4, with rugose muscle insertions and 18 pairs of setae, six dorsal, two median, six prolateral, four postlateral : D1 14-18 long, D2 and D3 14-15, D4 17-18, D5 18-19, D6 9-11, M1 14-17, M2 23-26, L1 18-19, L2 17-18, L3 19-22, L4 21-23, L5 18-21, L6 22-24, L7 18-23, L8 and L9 24-27, L10 44-50. L1 as long as interspace L1/L2 ; L2 as long as interspace L2/L3 ; all other setae shorter than distances between their bases and those of next following setae. L10 serrated and strongly knobbed. M2 variable : of 20 specimens 13 smooth, five with one or more filaments, two slightly notched. All other setae smooth and thornlike. Five pairs of large pores and eight pairs of small pores as figured. S1 and S2 22-24 on interscutal membrane. Peritremes extending almost to bases of D1 (Fig. 7).



FIGS. 7-14. — *Typhlodromus dossei* sp. n.

(7-12) FEMALE : 7) dorsum ; 8) sternal shield ; 9) ventrianal shield ; 10) chelicera ; 11) spermatheca ; 12) leg. IV.
(13-14) MALE : 13) ventrianal shield ; 14) spermatodactyl.

Venter. — Sternal shield 72 long, 63 wide, with two pairs of setae and two pairs of pores. Sternal setae III on interscutal membrane ; sternal setae IV on small oval shields (Fig. 8). Smooth pentagonal ventrianal shield 101-106 long, 81-87 wide, with four pairs of preanal setae (anterior two pairs on margin of shield) and a pair of preanal pores 22-26 apart. Ventral interscutal membrane with four pairs of setae (caudolateral pair thornlike). Primary metapodal shield broad, secondary one very slender (Fig. 9).

Chelicera. — Fixed digit 20 long, with four large subapical teeth and pilus dentilis. Movable digit 21 long, with two teeth, anterior one pointing backwards (eight observations) (Fig. 10).

Spermatheca. — Sack-like, lips of atrium occupying almost whole width of major duct where it enters cervix (Fig. 11).

Legs. — Single thornlike macroseta on basitarsus IV 21-22 long (Fig. 12).

MALE (Figs 13-14)

Dorsum. — Imbricated idiosoma 222-228 long, 127-135 wide at L4, with rugose muscle insertions and chaetotaxy resembling that of female, but setae relatively shorter : D1 11-13 long, D2 and D3 11-12, D4 11-14, D5 13-14, D6 8-9, M1 12-14, M2 17-20, L1 13-14, L2 14-15, L3 13-14, L4 15-17, L5 16-17, L6 16-18, L7 16-19, L8 17-19, L9 15-17, L10 28-29, S1 and S2 17-18.

Venter. — Imbricated ventrianal shield with four pairs of preanal setae ; preanal pores 14-15 apart (Fig. 13).

Spermatodactyl. — Shaft 12 long, with strong rounded heel. Foot short, terminating in large, round knob (Fig. 14).

Legs. — Thornlike macroseta on basitarsus IV 17-18 long.

Typhlodromus caudiglans Schuster (Figs 15-21).

Typhlodromus caudiglans Schuster, 1959 : 88.

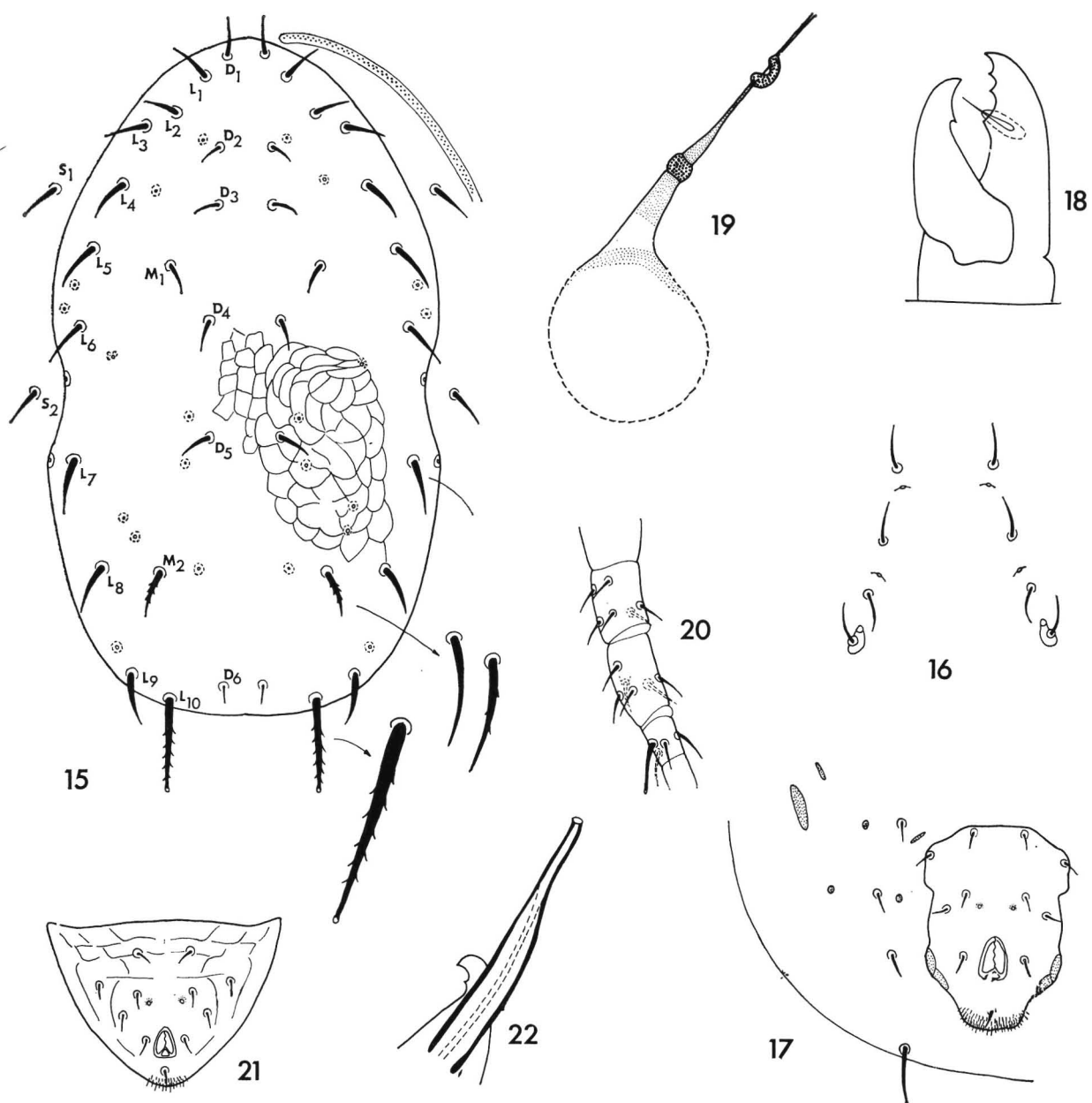
Material examined. — CALIFORNIA : three ♀♀ labelled *Typhlodromus caudiglans* Schuster, on galls of English walnut in association with eriophyid mites, Davis, 1.vii.1957 and 28.vi.1957, R. O. Schuster (paratypes) ; one ♀ labelled *Typhlodromus caudiglans* Schuster, ex cherry, Davis, 28.viii.1957, L. M. Smith (paratype) ; one ♂ (together with two ♀♀) labelled *Typhlodromus caudiglans* Schuster, ex cherry in association with *Bryobia* sp., Davis, 22.viii.1957, L. M. Smith (paratypes). All in CAS.

FEMALE (Figs 15-20)

Dorsum. — Imbricated idiosoma 354-358 (353) long, 167-177 wide at L4, with rugose muscle insertions and 18 pairs of setae, six dorsal, two median, six prolateral, four postlateral : D1 16-21 (25) long, D2 11-14 (16), D3 14-16 (17), D4 14-19 (18), D5 14-19 (11), D6 8-10 (11), M1 14-17 (19), M2 25-28 (31), L1 23-25 (24), L2 18-20 (21), L3 20-23 (24), L4 22-26 (27), L5 25-28 (29), L6 28-29 (29), L7 28-32 (29), L8 28-29 (28), L9 27-29 (28), L10 50-51 (53). L1 as long as interspace L1/L2 ; L2 as long as interspace L2/L3 ; all other setae shorter than distances between their bases and those of next following setae. L10 serrated and slightly knobbed, M2 variable : of 4 specimens 4 serrated, 2 slightly serrated, 2 smooth ; all other setae smooth. 13 pairs of pores as figured. S1 23-26 (29) and S2 20-21 (25) on interscutal membrane. Peritremes extending almost to bases of D1 (Fig. 15).

Venter. — Sternal shield barely visible ; three sternal setae. Sternal setae IV on small oval shields (Fig. 16). Smooth pentagonal ventrianal shield 105-111 long, 79-85 wide, with four pairs of preanal setae (anterior two pairs on margin of shield) and a pair of preanal pores 15-20 apart. Ventral interscutal membrane with four pairs of setae. Primary metapodal shield oval, secondary one weakly sclerotised (Fig. 17).

Chelicera. — Both digits 22-24 long. Fixed digit with three large subapical teeth and pilus dentilis. Movable digit 21 long, with one tooth pointing backwards (Fig. 18).



FIGS. 15-22. — *Typhlodromus caudiglans*.

(15-20) FEMALE : 15) dorsum ; 16) sternal shield ; 17) ventrianal shield ; 18) chelicera ; 19) spermatheca ;
 20) leg IV.
 (21-22) MALE : 21) ventrianal shield ; 22) spermatodactyl.

Spermatheca. — Funnel-like cervix, with knot-like atrium occupying whole width of major duct where it enters cervix (Fig. 19).

Legs. — Single slightly knobbed macroseta on basitarsus IV 25-28 long (Fig. 20).

MALE (Figs 21-22)

Dorsum. — Imbricated idiosoma 261 long, 145 wide at L4, with rugose muscle insertions and chaetotaxy resembling that of female, but setae relatively shorter : D1 ? long, D2 11, D3 12, D4 and D5 14, D6 6, M1 13, M2 21, L1 22, L2 16, L3 17, L4 and L5 19, L6 21, L7 22, L8 20, L9 20, L10 35, S1 20, S2 17.

Venter. — Imbricated ventrianal shield 90 long, 128 wide, with four pairs of preanal setae ; preanal pores 16 apart (Fig. 21).

Spermatodactyl. — Tubular, tapering towards apex (Fig. 22).

Legs. — Single slightly knobbed macroseta on basitarsus IV 21 long.

***Typhlodromus brisbanensis* sp. n.** (Figs. 23-27)

Type. — QUEENSLAND : on leaves of unsprayed strawberry, Brisbane, 3.v.1977, L. Markwell. Holotype ♀ (T.br.1) in BCRI.

FEMALE (Figs 23-27)

Dorsum. — Imbricated idiosoma 312 (D1-D6) long, 145 wide at L6 (L6-L6), with rugose muscle insertions and 18 pairs of setae, six dorsal, two median, six prolateral, four postlateral : D1, D2 and D3 15 long, D4 17, D5 21, D6 7, M1 17, M2 28, L1 19, L2 16, L3 18, L4 19, L5 22, L6, L7 and L8 25, L9 15, L10 50. L1 as long as interspace L1/L2 ; L2 as long as interspace L2/L3 ; all other setae shorter than distances between their bases and those of next following setae. L10 serrated and strongly knobbed, M2 serrated, all other setae smooth and thornlike. Four pairs of large pores and nine pairs of small pores as figured. S1 18 and S2 15 on interscutal membrane. Peritremes extending beyond bases of D1 (Fig. 23).

Venter. — Sternal shield 60 long, 67 wide, with three pairs of setae and two pairs of pores. Sternal setae IV on small oval shields (Fig. 24). Smooth pentagonal ventrianal shield 102 long, 80 wide, with four pairs of preanal setae and a pair of preanal pores 19 apart. Ventral interscutal membrane with four pairs of setae (caudolateral pair long, smooth and knobbed) (Fig. 25).

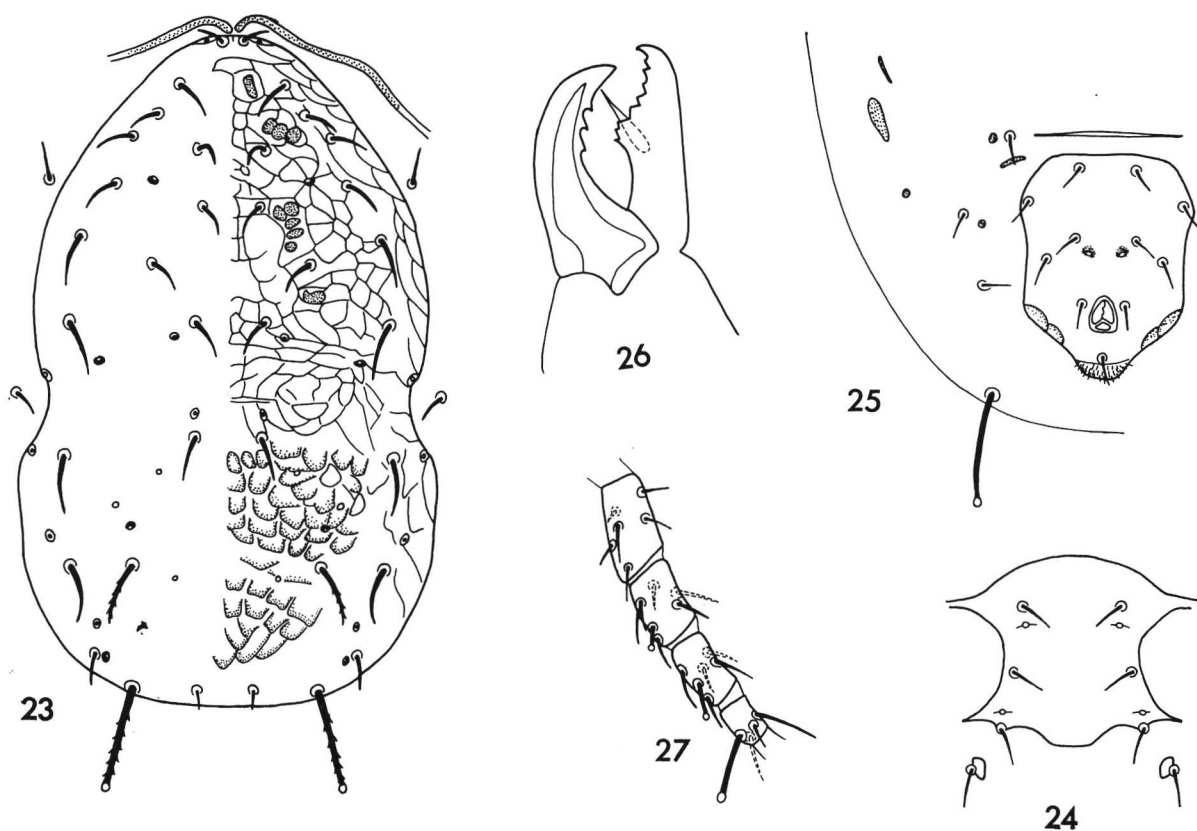
Chelicera. — Fixed digit 21 long, with five medium sized teeth anterior of pilus dentilis and three very small teeth posterior of pilus dentilis. Movable digit 23 long, with three backward pointing teeth (Fig. 26).

Spermatheca. — Invisible.

Legs. — Three knobbed macrosetae on leg IV : on genu 10 long, on tibia 15, on basitarsus 29 (Fig. 27).

NOTES

Using VAN DER MERWE (1968) the new species keys out to *Typhlodromus* (*Anthoseius*) *saevus*. However, females of *dossei* differ from those of *saevus* by having two teeth instead of one on the movable digit of the chelicerae, the setae of their idiosoma shorter and thornlike (except for D6 and L9 which are serrated), five pairs of large pores and eight pairs of small pores on the idiosoma, instead of only five pairs of pores, the shape of the stigma and secondary pore on the peritreme different, the lips of the spermatheca larger, and the distance between the preanal pores more than twice that of *saevus*. In addition the preanal pores of males of *dossei* are wider apart than those of *saevus*.



FIGS. 23-27. — *Typhlodromus brisbanensis* sp. n.
FEMALE : 23) dorsum ; 24) sternal shield ; 25) ventrianal shield ; 26) chelicera ; 27) leg IV.

The specimens of *dossei* from Tasmania examined here were previously identified by E. COLLYER as *T. caudiglans* Schuster (see labels on slides from Tasmania). But although *dossei* belongs to the rhenanus group following the key of CHANT (1959) it is different from all the species in this group, and in particular from *caudiglans*. Females of *dossei* differ from those of *caudiglans* by having two teeth instead of one on the movable digit and four teeth instead of three on the fixed digit of the chelicerae, a shorter and narrower idiosoma, most setae on the idiosoma slightly shorter (between 1 and 9 micrometres), (except for D2, D5, D6, M1 and S2 which are equal in both species), the shape of the spermatheca different, the preanal pores slightly wider apart, and the macrosetae of basitarsus IV shorter and thornlike, instead of slightly knobbed as in *caudiglans*.

The female of *T. brisbanensis* is very closely related to females of *T. dossei* and those of *caudiglans* if only their dorsal shields are compared, because most of the setae of their dorsal shields are of near equal length. However, in *brisbanensis*, setae L9 are approximately half as long as those in *dossei* and *caudiglans*. Other more conspicuous differences are as follows. There are three teeth on the movable digit of the chelicerae in *brisbanensis*, but only two on that of *dossei* and one on that of *caudiglans*. There are eight teeth on the fixed digit of the chelicerae in *brisbanensis*, but only four on that of *dossei* and three on that of *caudiglans*. The caudolateral setae in *brisbanensis* are long and knobbed, while those in *dossei* and *caudiglans* are short and setaceous. Sternal setae III are on the sternal shield in *brisbanensis*, but on the interscutal membrane in *dossei* (invisible in *caudiglans*). There are three knobbed macrosetae on leg IV in *brisbanensis*, but only one stout macroseta on basitarsus IV in *dossei* and one slightly knobbed macroseta in *caudiglans*.

ACKNOWLEDGEMENTS

I am indebted to Professor Dr. G. DOSSE, University of Stuttgart-Hohenheim, West Germany, after whom *T. dossei* sp. n. is named, for critically reading part of the manuscript. I thank Dr. R. O. SCHUSTER, Senior Museum Scientist, University of California, Davis, U.S.A., for the loan of paratypes of *T. caudiglans* Schuster, as well as Dr. M. K. P. MEYER, Director of the Plant Protection Research Institute, Pretoria, South Africa, for the loan of paratypes of *T. (A.) saevus* Van der Merwe.

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Paru en Juillet 1979.
