

SOME PHYTOSEIID MITES (ACARI) OF PAPUA NEW GUINEA, WITH DESCRIPTIONS OF SIX NEW SPECIES

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ABSTRACT—Fourteen species of Phytoseiidae, 6 of which are new, were collected in the Wau and Bulolo areas of Papua New Guinea. Descriptions and diagnoses are given for *Typhlodromus gressitti* n. sp., *Amblyseius multisetosus* n. sp., *A. grandiductus* n. sp., *A. papuaensis* n. sp., *A. aspercervix* n. sp., and *A. paucisetosus* n. sp. Supplementary descriptions and illustrations are given for *A. newsami* (Evans) and *Iphiseius dinguensis* Wu.

INTRODUCTION

The phytoseiid fauna of Papua New Guinea has not been studied extensively. The present study is preceded only by that of Schicha and Gutierrez (in press) which recorded 3 new and 9 known species. In 1979 the senior author, during a one month period at the Wau Ecology Institute, Morobe Province, collected Phytoseiidae in the Wau-Bulolo area on various native and introduced plants. Fourteen species, 6 of which are new, are reported in this paper. Only 2 of these 14 were listed by Schicha and Gutierrez. A redescription of *Amblyseius newsami* (Evans) is included because of its similarity to one of the new species.

Most of the collections were made on the grounds of the Wau Ecology Institute (W.E.I.) from May 20 to June 12, 1979 at elevations of 1100-1400 m. The mean annual rainfall in this area is 1887 mm (Gressitt and Nadkarni, 1978).

All measurements are in microns. The setal nomenclature follows that of Chant and Hansell (1971) and Rowell et al. (1978). The generic placement of species generally follows the concepts of Chant (1965).

The following abbreviations are used for museums or collections: USNM - U.S. National Museum of Natural History; UCR - Division of Biological Control, University of California, Riverside.

Genus *Typhlodromus* Scheuten

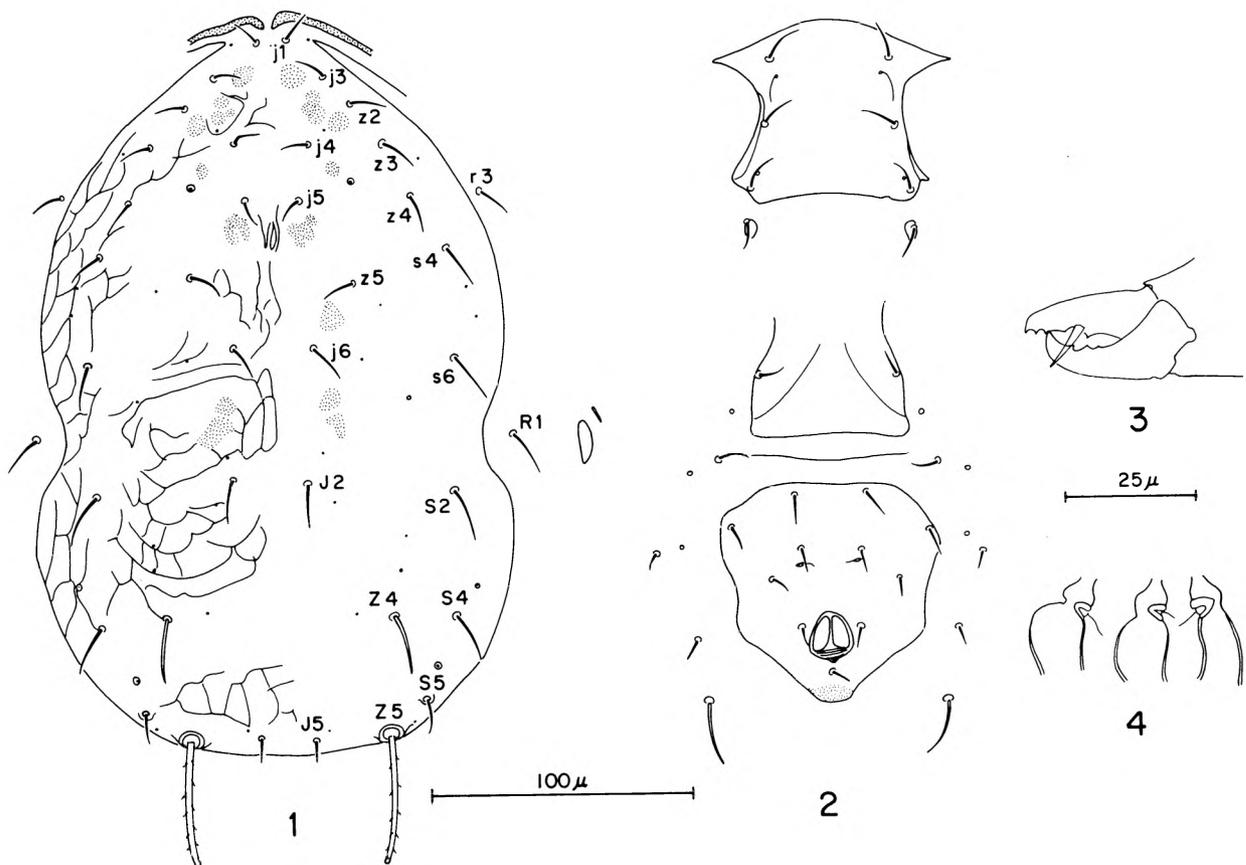
Typhlodromus Scheuten, 1857:111.

Typhlodromus gressitti McMurtry & Moraes, n.sp.

DIAGNOSIS: *Typhlodromus miyari* Ehara differs from *T. gressittii* by the much shorter setae Z5 (26). *Typhlodromus brisbanensis* Schicha and *Typhlodromus crassus* Van der Merwe have the posterior margin of the sternal shield lobate instead of straight and longer dorsal shield setae. *T. brisbanensis* further differs by having longer StIV (29) and a more elongate ventrianal shield. *Typhlodromus gutierrezii* Blommers has most of the dorsal shield setae longer (ca. 50%) and a more elongate ventrianal shield. *Typhlodromus gracilentus* Tseng is also a closely related species, but it has longer dorsal shield setae (ca. 20%), except for Z5, which is shorter (ca. 20%).

FEMALE: (Figs. 1-4) (5 specimens measured). **Dorsum:** Dorsal shield reticulated, 298 (288-317) long, 182 (178-190) wide at widest level of proscutum. Setae j1 12, j3 14 (13-14), j4 11 (10-12), j5 12, j6 15 (13-17), J2 19 (18-19), J5 6 (6-7), z2 13 (12-13), z3 14 (13-16), z4 15 (14-16), z5 12 (12-13), Z4 25 (24-26), Z5 48 (46-50), s4 18 (17-19), s6 21 (20-23), S2 21 (20-23), S4 20 (19-23), S5 15 (13-18), r3 15 (13-17), R1 14 (13-14). All setae smooth, except for Z5 which is barbed and knobbed. **Peritreme:** Extending beyond level of j1, with anterior end curved slightly backwards. **Venter:** Sternal shield with 3 pairs of setae and with posterior margin straight. Distances between sternal setae ST1-ST3 52 (52-53), ST2-ST2 52 (52-53), and genital setae G-G 55 (53-56). Ventrianal shield subquadrate, 86 (78-90) long, 84 (83-86) wide at level of ZV2. **Chelicera:** Movable digit 23 long, with 3 teeth; fixed digit 22 long, with 4 teeth. **Spermatheca:** Cervix cup-shaped, 12 long. Atrium globate. **Legs:** Macrosetae knobbed, of the following lengths: SgeIV 8 (7-8), StiIV 14

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Figs. 1-4. *Typhlodromus gressitti* n. sp. Female: 1. dorsal shield 2. ventral surface 3. chelicera 4. spermatheca

(13-14), StIV 18 (18-19). Chaetotaxy of GeII 2, $\frac{2-2}{0}$, 1; GeIII 1, $\frac{2-2}{0}$, 1.

MALE: Unknown.

LOCALITY AND TYPE MATERIAL: Holotype female (in USNM) and 4 female paratypes (2 in USNM, 2 in UCR) from *Cryptocarya* sp., Wau, Papua New Guinea, 26-V-79. Two female paratypes (UCR), from *Araucaria* sp., Wau, Papua New Guinea, 4-VI-79 (J.A. McMurtry).

Genus *Phytoseius* Ribaga

Phytoseius Ribaga, 1902:177.

Phytoseius hongkongensis Swirski and Shechter

Phytoseius (*Phytoseius*) *hongkongensis* Swirski and Shechter, 1961:99; Denmark, 1966:44.

Phytoseius (*Pennaseius*) *hongkongensis*, Ehara and Lee, 1971:70.

Phytoseius hongkongensis, Schicha, 1984:126.

SPECIMENS EXAMINED: 4 FF (females), ex.

Tephrosia sp., Edie Creek Road, near W.E.I., elevation ca. 1700 m., associated with *Paraphytoseius cracentis* (Corpuz and Rimando).

PREVIOUS RECORDS: *Hong Kong* (Ehara & Lee 1971, Swirski & Shechter 1961); *Japan* (Ehara 1972); *Thailand* (Ehara & Bhandhufalck 1977); *Taiwan* (Tseng 1976); *Madagascar* (Blommers 1976); *Australia* (Schicha 1984).

REMARKS: The 4 Papua New Guinea specimens correspond closely in setal lengths and other details to the original description (Swirski and Shechter 1961) and that of Ehara and Lee (1971). Schicha and Gutierrez (in press) also report this species from Papua New Guinea. Schicha (1984) pointed out that some variations in setal lengths occur between populations of *P. hongkongensis* from different geographic areas.

Genus *Paraphytoseius* Swirski and Shechter

Paraphytoseius Swirski and Shechter, 1961:113; Matthyse and Denmark, 1981:342.

Amblyseius (*Paraphytoseius*) Ehara, 1967:77.

Paraphytoseius cracentis (Corpuz and Rimando)

Ptenoseius cracentis Corpuz and Rimando, 1966:115.
Paraphytoseius cracentis, Swirski and Golan,
 1967:226.

SPECIMENS EXAMINED: *Papua New Guinea*: Near Wau, Edie Creek Road, elevation ca. 1700 m, 6 FF, ex. *Tephrosia* sp.; elevation ca. 1400 m, 1 F, ex. *Piper* sp.; W.E.I., 1 F, ex. *Melinis minutiflora*. *Philippines*: Mindanao, 1 F, 1 M, ex. *Lantana* sp., 30-VIII-80, E. Swirski.

PREVIOUS RECORDS: *Philippines* (Corpuz & Rimando 1966, Swirski & Golan 1967).

REMARKS: Our specimens closely resemble those of *P. cracentis* from the Philippines. These specimens have seta S5 present, macrosetae SgeIV and StiIV with distinctly swollen tips, St (basitarsus) IV only slightly enlarged at tip and St (distitarsus) IV narrowing toward tip, and all other setae on legs acuminate except for one dorsal seta on GeII. We consider them different from specimens from New Caledonia (McMurtry and Moraes 1984), which fit the original description of Swirski and Shechter (1961) of *P. multidentatus*, in which seta S5 is absent, all 4 macrosetae of leg IV are distinctly swollen at the tips, and most dorsal setae on Ge and Ti are rod-shaped or blunt-tipped (seta ad2 of GeII is sharp-tipped). Although Matthyse and Denmark (1981) synonymized *P. cracentis* with *P. multidentatus* we consider them to be distinct species.

Average measurements of 2 female *P. cracentis* as follows: Dorsal shield length 268, width 146, j1 33, j3 90, j4 4, j5 5, j6 6, J5 5, z2 10, z4 10, z5 4, Z1 9, Z4 71, Z5 95, s4 117, S5 14, r3 37, R1 23, SgeIV 22, StiIV 34, St (basitarsus) IV 38, St (distitarsus) 39.

We collected *P. cracentis* on the same plant (*Tephrosia* sp.) as *Phytoseius hongkongensis*. No potential food source was observed.

Species of *Paraphytoseius* share several presumably derived characters with many *Phytoseius* species, including: large "pores" on the dorsal shield near setae z5; thick, barbed setae j3, s4, Z4 and Z5; 3 pairs of setae on the ventrianal shield in nearly longitudinal rows near lateral margins of shield; spatulate macrosetae on leg IV, setae z4 and s4 in close proximity, Z4 close and anterolateral to Z5; S2, S4 absent. Species of *Paraphytoseius* differ from those of *Phytoseius* in the following aspects: setae z3 and s6 absent, Z1 present; r3 on the membraneous cuticle rather than the dorsal shield; chelicerae multidentate.

Genus *Amblyseius* Berlese
Amblyseius Berlese, 1914:143.

Amblyseius multisetosus McMurtry & Moraes, n.sp.

DIAGNOSIS: This species is unique among species in the genus *Amblyseius* by the presence of both setae z6 and J3.

FEMALE: (Figs. 5-7) (1 specimen measured).
Dorsum: Dorsal shield reticulated, 336 long, 228 wide at widest level of proscutum. Setae j1 24, j3 13, j4 12, j5 12, j6 11, J2 12, J3 10, J5 8, z2 18, z4 14, z5 13, z6 13, Z1 13, Z4 12, Z5 34, s4 17, S2 16, S4 13, S5 12, r3 13, R1 13. All setae smooth. *Peritreme*: Extending forward to level of j1. *Venter*: Sternal shield with 3 pairs of setae. Posterior margin not discernable. Distances between ST1-ST3 50, ST2-ST2 61, G-G 65. Ventrianal shield vase-shaped, 102 long, 61 wide at level of ZV2 and 72 wide at level of anus. *Chelicera*: Movable digit 24, apparently without teeth; fixed digit 23, apparently with 2 teeth. *Spermatheca*: With a very shallow bowl-shaped cervix. Atrium elongate, sclerotized for a length of 8 microns. *Legs*: With blunt-tipped setae, in addition to setiform setae, on genu, tibia and tarsus of all legs and femur of leg I, but no characteristic macrosetae. Chaetotaxy of GeII 2, $\frac{2-2}{0}$, 1; GeIII 1, $\frac{2-2}{1}$, 1.

MALE: Unknown.

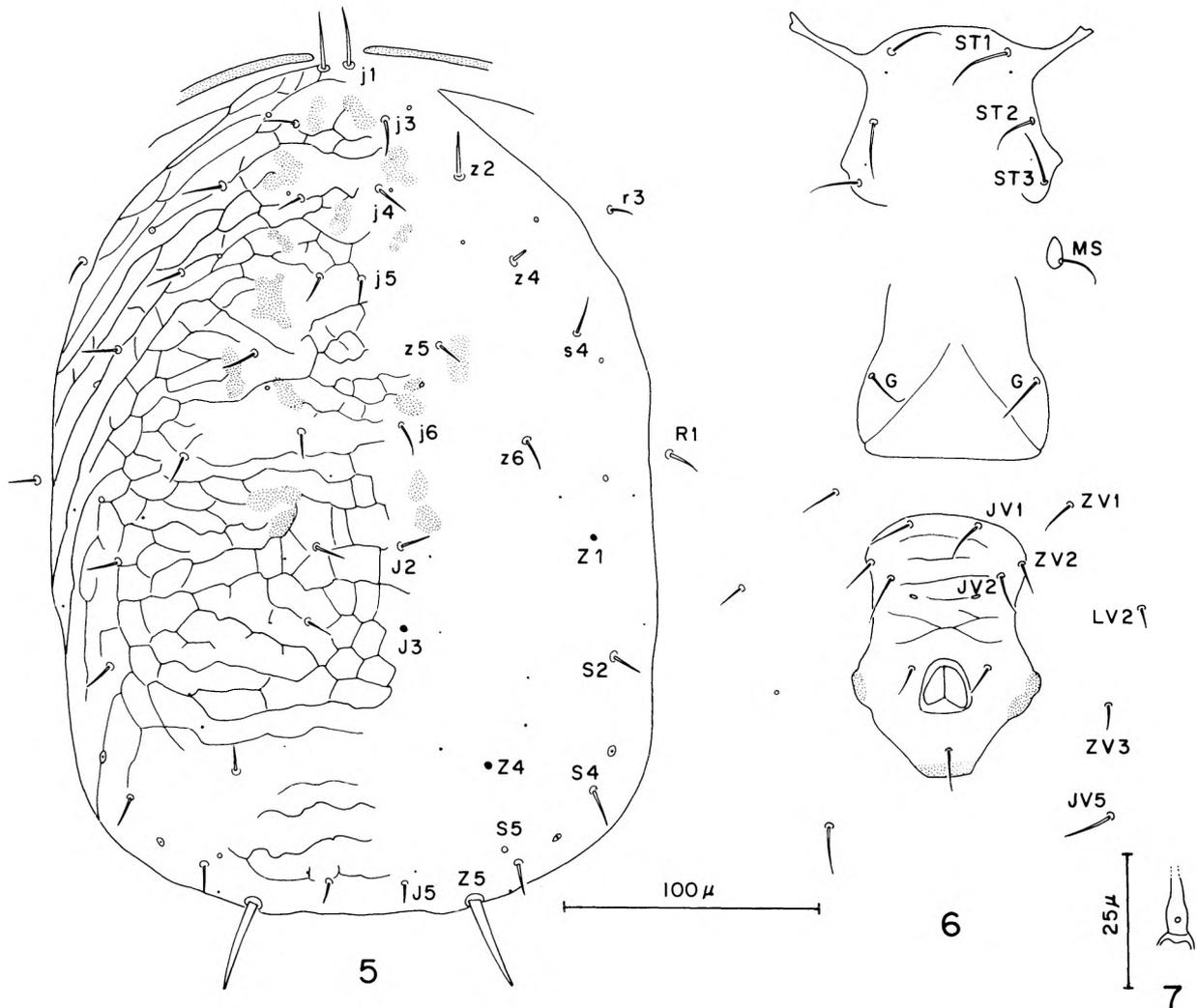
LOCALITY AND TYPE MATERIAL: Holotype female (in UCR) from *Castanopsis* sp., Edie Creek Road, near Wau, Papua New Guinea (elevation ca. 1600 m), VIII-6-79 (J.A. McMurtry).

REMARKS: *Chileseius camposi* Gonzalez & Schuster also has what we interpret as setae z6 and J3. However, it differs from *A. multisetosus* by having another seta which we interpret as Z3. Furthermore, setae J3, Z4, Z5 and S2-S5 are barbed in *C. camposi* and smooth in *A. multisetosus*, and the dorsal shield pattern is areolate in *C. camposi* and reticulate in *A. multisetosus*.

Amblyseius grandiductus McMurtry & Moraes, n.sp.

DIAGNOSIS: This species resembles *Amblyseius annae* Schicha & Gutierrez, *A. newsami* (Evans), *A. neomarkwelli* Schicha, *A. anuwati* Ehara & Bhandhu-falck, *A. munsteriensis* Van der Merwe and *A. japonicus* (Ehara) but differs from them by having a disc-shaped spermathecal cervix. *A. nova* differs from *A. grandiductus* by having funnel-shaped spermatheca and much longer SgeIV (86). It further differs from all those species except for *A. neomarkwelli* by having r3 and R1 on the dorsal shield.

FEMALE: (Figs. 8-11) (8 specimens measured).
Dorsum: Dorsal shield 320 (307-336) long and 228 (221-235) wide at widest level of proscutum, with longitudinal striations laterally and some irregular stri-



Figs. 5-7. *Amblyseius multisetosus* n. sp. Female: 5. dorsal shield 6. ventral surface 7. spermatheca

ations on posterior half of shield. Setae j1 12 (11-12), j3 13 (12-14), j4 8 (7-10), j5 8, j6 10 (8-11), J2 12 (11-13), J5 8 (7-8), z2 11 (10-13), z4 12 (11-13), z5 9 (8-11), Z1 12 (11-14), Z4 13 (12-17), Z5 74 (70-78), s4 14 (12-14), S2 12 (11-12), S4 12 (11-13), S5 7 (6-7), r3 11 (10-12), R1 9 (8-10). Z5 barbed; all other setae smooth. Setae r3 and R1 on dorsal shield. *Peritreme*: Extending forward beyond level of j1. *Venter*: Posterior margin of sternal shield usually lobate. Distances between bases of setae ST1-ST3 47 (46-48), ST2-ST2 55 (54-56) and G-G 66 (62-68). Ventrianal shield with lateral margins concave posteriorly to JV2, 100 (96-104) long, 72 (67-76) wide at level of ZV2 and 72 (70-74) wide at level of anus. *Chelicera*: Movable digit 24, with 3 teeth; fixed digit 23, with 8 teeth. *Spermatheca*: Cervix disc-shaped; atrium distinct and globate. Major duct sausage-shaped, but not well visible in all specimens due to the positioning of the

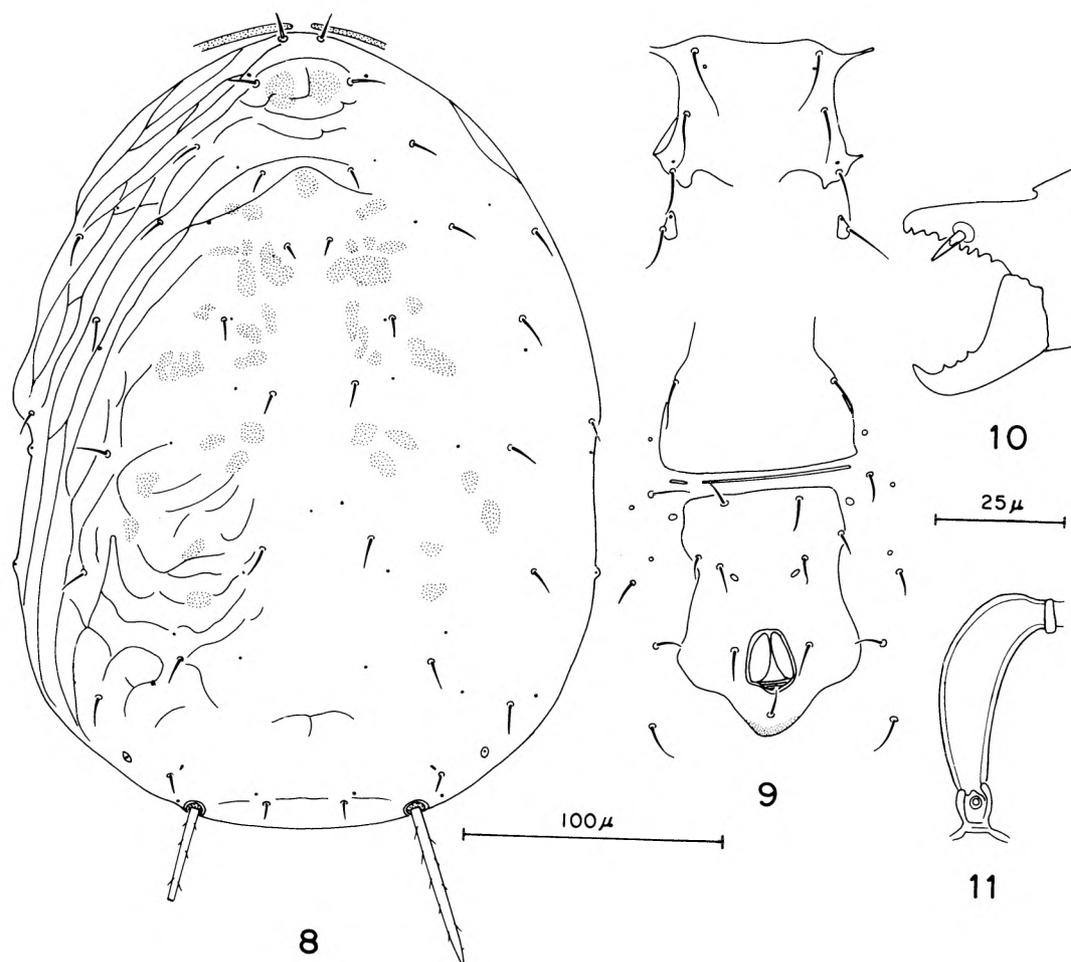
spermatheca. *Legs*: Macrosetae of the following lengths: SgeIII 23 (22-24), StiIII 17 (17-18), SgeIV 35 (32-38), StiIV 24 (23-25), StIV 34 (32-36); those of leg IV with a very small knob at tip. Chaetotaxy of GeII 2, $\frac{2-2}{0}$, 1; GeIII 1, $\frac{2-2}{1}$, 1.

MALE: Unknown.

LOCALITY AND TYPE MATERIAL: Holotype female (in USNM) and 7 paratype females (in UCR) from *Casuarina oligodon*, Wau, Papua New Guinea, 11-VI-79 (J.A. McMurtry).

Amblyseius papuaensis McMurtry & Moraes, n.sp.

DIAGNOSIS: *Amblyseius anuwati* Ehara & Bhandhufalck, *A. japonicus* (Ehara), *A. hova* Blommers and *A. neomarkwelli* Schicha differ from *A. papuaensis* in having striations on the dorsal shield and by the shape of the spermathecae. The first two



Figs. 8-11. *Amblyseius grandiductus* n. sp. Female: 8. dorsal shield 9. ventral surface 10. chelicera 11. spermatheca

species also differ by having shield-shaped ventrianal shields, and the other two species differ by having sub-rectangular ventrianal shields. *A. newsami* (Evans) can be distinguished from *A. papuaensis* by the shape of the spermatheca.

FEMALE: (Figs. 12-14) (2 specimens measured).

Dorsum: Dorsal shield smooth, except for a few striae laterad to setae j3 and z2, 313 (305-322) long, 205 (202-209) wide at widest level of proscutum. Setae j1 16 (16-17), j3 11 (11-12), j4 7, j5 6, j6 7 (6-7), J2 12, J5 5 (5-6), z2 10 (10-11), z4 10, z5 9 (8-10), Z1 11 (11-12), Z4 17, Z5 62 (61-64), s4 13, S2 13 (12-13), S4 11 (11-12), S5 9 (8-10), r3 12, R1 12. Setae Z5 serrate; all the others smooth. Setae r3 and R1 on lateral membrane. **Peritreme:** Extending forward beyond level of j1. **Venter:** Posterior margin of sternal shield slightly concave. Distances between bases of setae ST1-ST3 54 (53-54), ST2-ST2 54 (53-54), G-G 59 (56-62). Ventrianal shield vase-shaped, 93 (90-96) long, 52 (52-53)

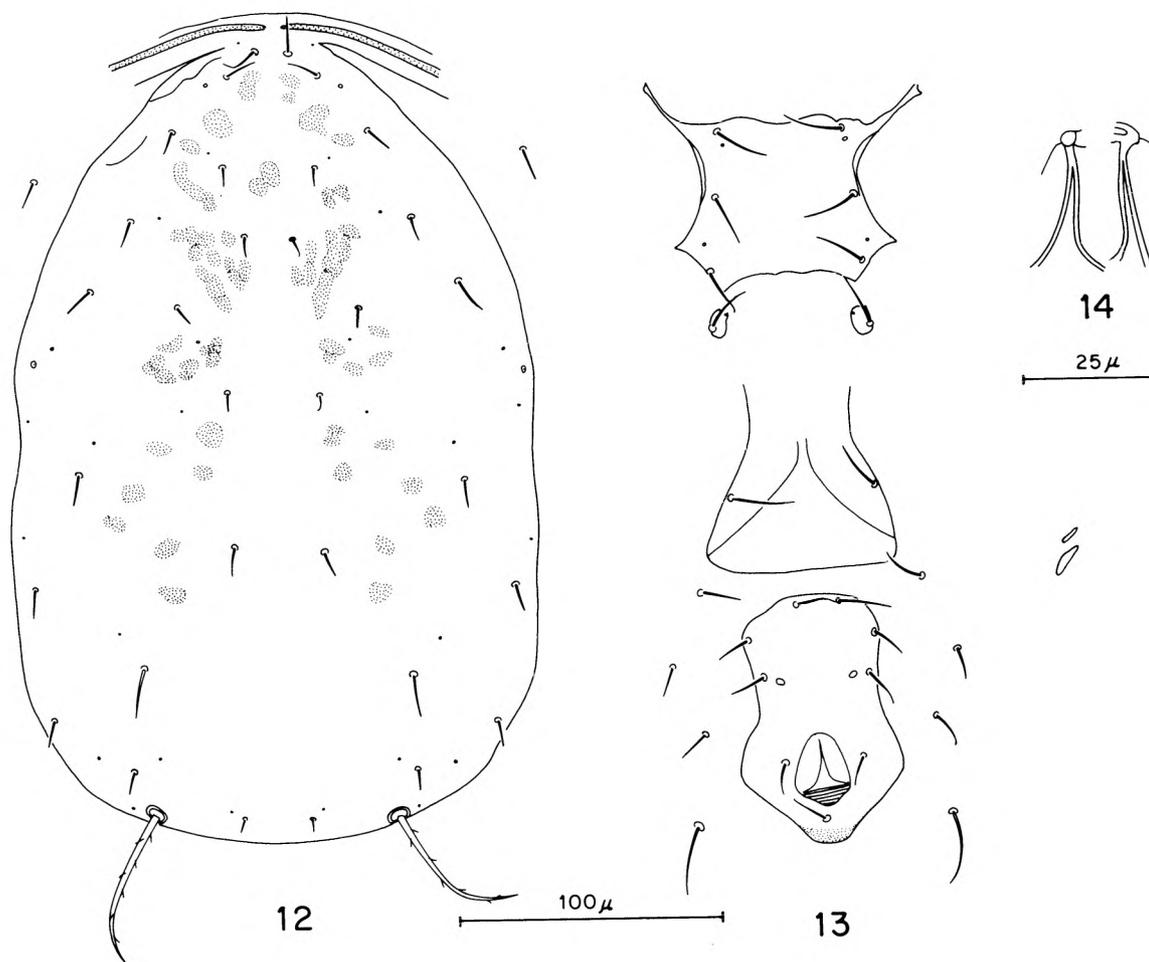
wide at level of ZV2 and 63 (61-64) wide at level of anus. Setae JV2 near lateral margin of shield and only slightly mediad to setae ZV2. **Chelicera:** Movable digit 23, with 3 teeth; fixed digit 22, with 9 teeth. **Spermatheca:** Cervix funnel-shaped, 22 long; distinct atrium. **Legs:** Macrosetal lengths: SgeI 32, SgeII 30 (29-31), SgeIII 31, StiIII 24, SgeIV 46 (46-47), StiIV 33 (32-34), StIV 47 (46-48). All macrosetae setiform. Chaetotaxy of GeII 2, $\frac{2-2}{0}$, 1; GeIII 1, $\frac{2-2}{1-0}$, 1.

MALE: Unknown.

LOCALITY AND TYPE MATERIAL: Holotype female (in USNM) from *Piper* sp., Wau, Papua New Guinea, 27-V-79. Female paratype (in UCR) from *Tectaria* sp. (fern), Wau, Papua New Guinea, 2-VI-79 (J.A. McMurtry).

Amblyseius newsami (Evans)

Typhlodromus newsami Evans, 1953:450.



Figs. 12-14. *Amblyseius papuaensis* n. sp. Female: 12. dorsal shield 13. ventral surface 14. spermatheca

Typhlodromus (Amblyseius) newsami, Chant, 1959:153.

Amblyseius (Amblyseius) newsami, Ehara and Lee, 1971:61.

SPECIMEN EXAMINED: Holotype, from rubber plant (A. Newsam), Kuala-Lumpur-Malaya, in British Museum of Natural History.

PREVIOUS RECORDS: *Malaysia* (Evans 1953); *Thailand* (Ehara & Bhandhufalck 1977); *Hong Kong* (Ehara & Lee 1971, Swirski & Shechter 1961); *China* Wu (1981, 1982) stated that this species also occurs in Taiwan and Japan.

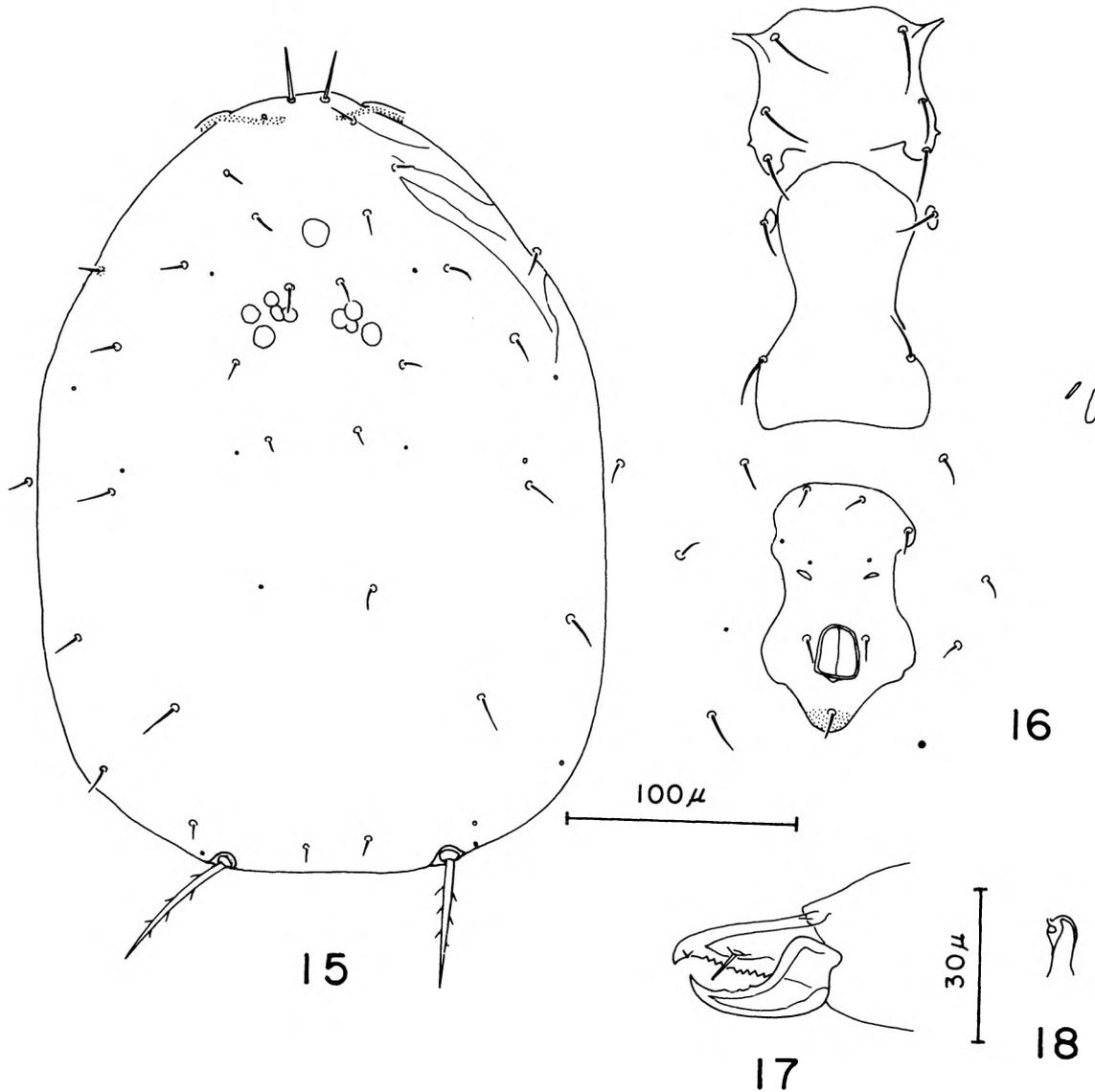
DIAGNOSIS: This species closely resembles *Amblyseius grandiductus* McMurtry & Moraes, n.sp., but is distinguished from it by not having a disc-shaped spermathecal cervix, by the longer j1 (twice as long) and all leg macrosetae (about 50% longer) and by having r3 and R1 on the lateral membrane.

FEMALE HOLOTYPE: (Figs. 15-18). *Dorsum:* Dorsal shield with a few lateral oblique striations, 348

long and 252 wide at widest level of proscutum. Setae j1 24, j3 10, j4 10, j5 10, j6 7, J2 8, J5 6, z2 8, z4 10, z5 10, Z1 13, Z4 17, Z5 58, s4 14, S2 13, S4 10, S5 8, r3 11, R1 8. All setae smooth, except for Z5 which are serrate. Setae r3 and R1 on lateral membrane. *Peritreme:* Extending forward beyond level of j1. *Venter:* Posterior margin of sternal shield indistinct. Distances between bases of setae ST1-ST3 55, ST2-ST2 72, G-G 68. Ventrianal shield with lateral margins concave posteriorly to JV2, 108 long, 72 wide at level of anus. *Chelicera:* Movable digit 28, with 3 teeth; fixed digit 29, with 10 teeth. *Spermatheca:* Cervix of spermatheca sclerotized for only a short distance. Major duct connected to side of atrium. *Legs:* Macrosetal lengths: SgeI 20, SgeII 26, SgeIII 36, StiIII 26, SgeIV 55, StiIV 35, StIV 44, all setiform.

Amblyseius okinawanus Ehara

Amblyseius (Amblyseius) okinawanus Ehara, 1967:72; Ehara and Lee, 1971:64; Ehara, 1972:156; Ehara



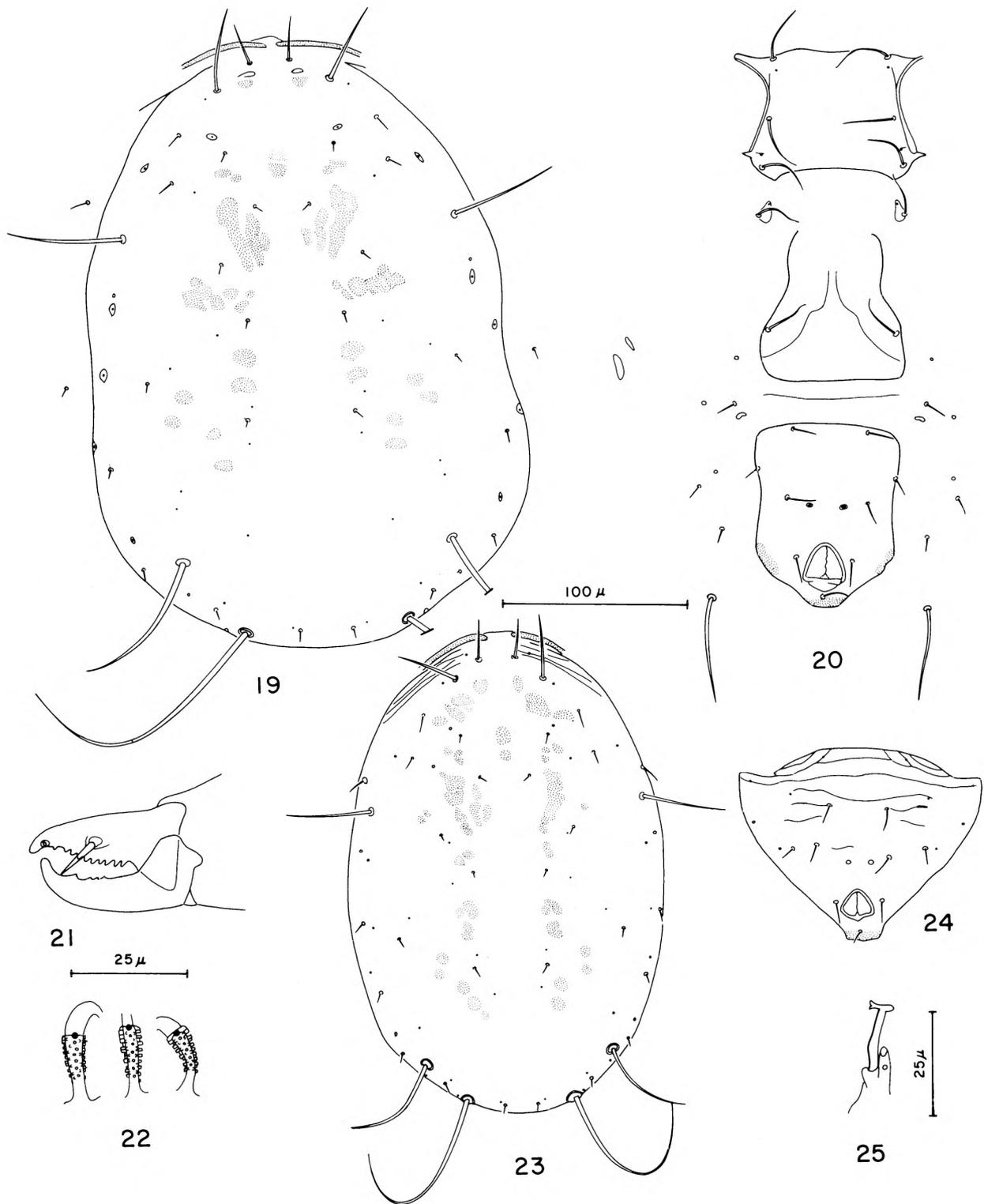
Figs. 15-18. *Amblyseius newsami* (Evans). Female: 15. dorsal shield 16. ventral surface 17. chelicera 18. spermatheca

and Bhandhufalck, 1977:58.

SPECIMENS EXAMINED: *Okinawa*: Tomikusuku, 1 paratype female, ex. *Verbena officinalis*, 22-IV-66; *Papua New Guinea*: Near Wau: Edie Creek Road, elevation ca. 1400 m, 1 F, ex. *Cordyline terminalis*; W.E.I. 5 FF, 1 M, ex. *Melinus minutiflora*.

PREVIOUS RECORDS: *Japan* (Ehara 1967, 1972, Ehara 1972, Ehara & Hamaoka 1980); *China* (Wu 1981, 1982); *Taiwan* (Chang & Tseng 1978, Lo 1970); *Hong Kong* (Ehara & Lee 1971); *Thailand* (Ehara & Bhandhufalck 1977); *USSR* (Wainstein 1975).

REMARKS: Our Papua New Guinea material resembled closely a paratype of *A. okinawanus*. Measurements (means and ranges) of 6 females as follows: dorsal shield length 333 (321-343), width 213 (206-222), j1 19 (18-19), j3 (12-13), j4 9 (7-10), j5 8 (6-10), j6 11 (11-12), J2 12 (11-12), J5 10, z2 12 (12-13), z4 12 (11-13), z5 9 (8-10), Z1 12 (12-13), Z4 31, Z5 78 (73-82), s4 17 (14-22), S2 16 (14-17), S4 15 (14-17), S5 15 (14-16), r3 13 (12-14), R1 9 (8-11), SgeII 10, SgeIII 17 (16-18), SgeIV 29 (28-30), StiIV 23 (22-28), StIV 51 (48-54), cervix of spermatheca 18 long. On at least one specimen, one of the setae R1 was on the dorsal shield rather than on the membrane adjacent to the shield.



Figs. 19-25. *Amblyseius aspercervix* n. sp. Female: 19. dorsal shield 20. ventral surface 21. chelicera 22. spermatheca; Male: 23. dorsal shield 24. ventrianal shield 25. spermatodactyl

Amblyseius syzygii Gupta

Amblyseius syzygii Gupta, 1975:44; 1977:74.
Amblyseius (Amblyseius) syzygii, Ehara and
 Bhandhufalck, 1977:56.

SPECIMENS EXAMINED: *Papua New Guinea:*
 Near Wau, Biawin village, 2 FF, ex. *Carica papaya*;
 W.E.I., 6 FF, 1 M, ex. *Pinus* sp.; 3 FF, 1 M, ex.
Cordyline terminalis; 3 FF, 1 M, ex. leaf of *Musa* sp.
 (banana).

PREVIOUS RECORDS: *India* (Gupta 1975,
 Gupta 1977, Gupta 1981, Gupta & Nahar 1981); *Thai-*
land (Ehara & Bhandhufalck 1977).

REMARKS: Our material conforms closely to the
 descriptions of Gupta (1975) and Ehara and Bhandhu-
 falck (1977), and to the illustrations in the latter paper.
 Mean measurements from 5 specimens (range) as fol-
 lows: Dorsal shield length 344 (336-353), width 228
 (221-238), j1 18 (17-19), j3 19 (19-20), j4 8 (7-8), j5 7,
 j6 9 (8-11), J2 12 (12-13), J5 8, z2 9 (8-10), z4 11
 (10-12), z5 9 (8-10), Z1 13 (12-13), Z4 30 (26-31), Z5 74
 (72-77), s4 16 (14-18), S2 12 (11-12), S4 11 (10-12), S5 9
 (8-10), r3 14 (12-16), R1 11 (10-13), SgeI 24 (23-24),
 SgeII 26 (24-28), SgeIII 34 (31-36), StiIII 30 (29-30),
 SgeIV 45 (43-50), StiIV 38 (36-40), StIV 54 (52-55).

Amblyseius asperocervix McMurtry & Moraes, n.sp.

DIAGNOSIS: *Amblyseius cinctus* differs from
 this species in having a cervix with a smooth-textured
 wall. *A. obtuserellus* Wainstein & Begljanov and
Amblyseius obtusus (Koch) appear to have a similar
 rough-looking cervix wall, but both species have setae
 s4, Z4 and Z5 about 1.2, 1.3-1.8 and 1.6-2.0 times
 longer, respectively, than *A. asperocervix*. The
 spermathecae of both species are more cylindrical and
 the length of the cervix of *A. obtuserellus* is about
 twice that of *A. asperocervix*.

FEMALE: (Figs. 19-22) (10 specimens measured).
Dorsum: Dorsal shield smooth, 334 (300-393) long,
 237 (230-248) wide at widest level of proscutum. Setae
 j1 28 (24-31), j3 47 (43-50), j4 4 (4-5), j5 4, j6 4 (4-5),
 J2 5 (4-5), J5 7 (6-8), z2 10 (10-12), z4 7 (6-8), z5 4
 (4-5), Z1 6 (5-7), Z4 87 (80-95), Z5 156 (144-166), s4 65
 (65-66), S2 7 (6-8), S4 7 (6-8), S5 6 (6-8), r3 13 (12-14),
 R1 7 (6-8). All setae smooth. *Peritreme:* Extending
 beyond level of j1. *Venter:* Sternal shield with poste-
 rior margin straight. Distance between ST1-ST3 60
 (58-64), ST2-ST2 71 (71-73), G-G 74 (70-78). Lateral
 margin of ventrianal shield slightly concave behind
 ZV2, 108 (96-115) long, 81 (77-84) wide at level of
 ZV2, 78 (74-80) wide at level of anus. *Chelicera:*
 Movable digit 37 (36-37) long, with 4 teeth directed

backwards; fixed digit 32 (31-32) long, with 11 teeth.
Spermatheca: Cervix ca. 14 long, slightly narrower
 near vesicle, with a rough appearance due to a number
 of external peg-like structures on the wall. Atrium not
 distinct. *Legs:* Macrosetae setiform, of the following
 lengths: SgeI 30 (29-32), SgeII 31 (30-34), SgeIII 38
 (34-43), StiIII 27 (24-31), SgeIV 79 (70-84), StiIV 55
 (47-64), StIV 63 (58-66). No erect seta on tarsus I.
 Chaetotaxy of GeII 2, $\frac{2-2}{0}$, 1; GeIII 1, $\frac{2-2}{1\ 0}$, 1.

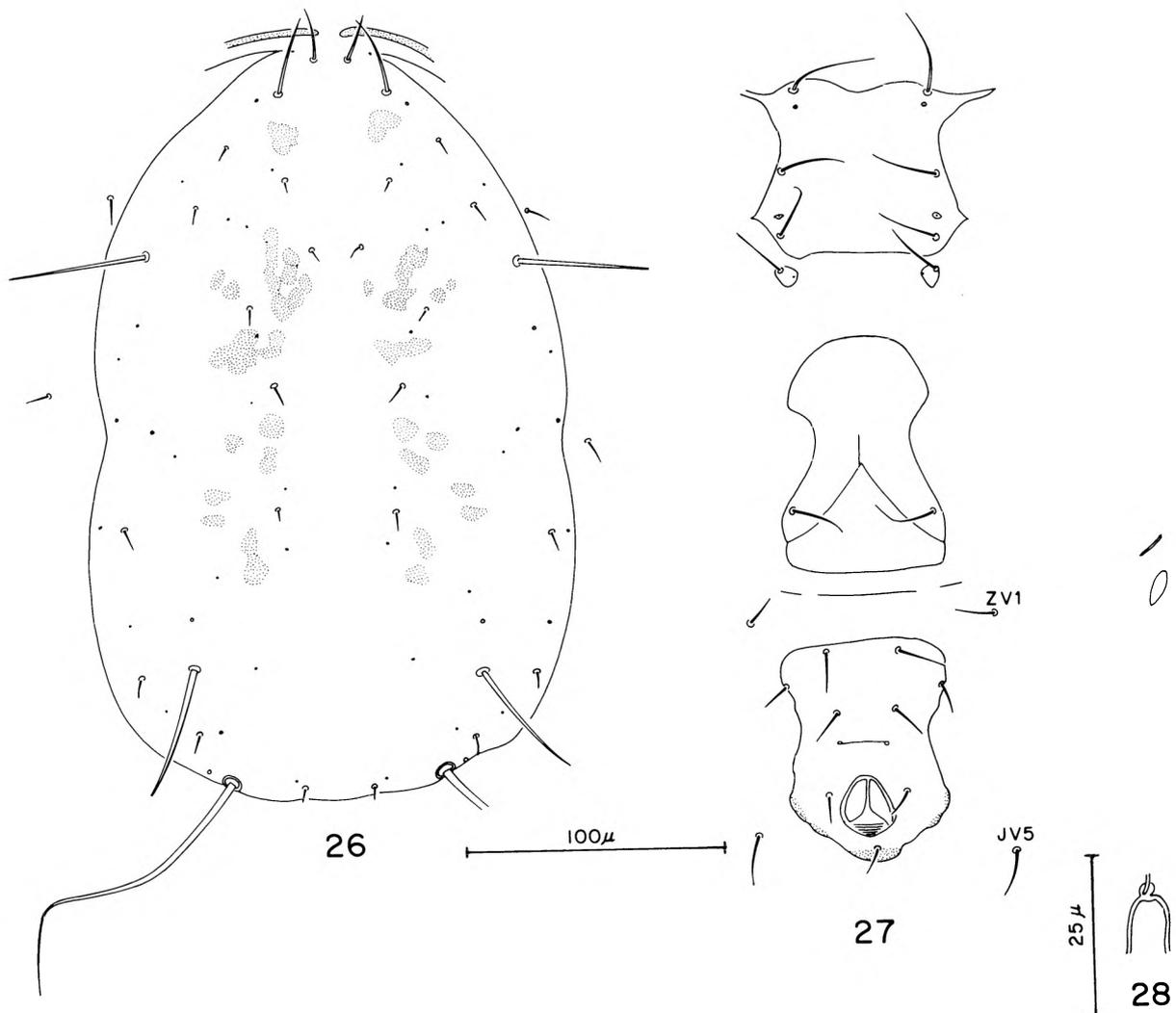
MALE: (Figs. 23-25) (5 specimens measured).
Dorsum: Dorsal shield smooth, 252 (242-260) long,
 170 (162-178) wide at widest level of proscutum. Setae
 j1 21 (18-24), j3 37 (36-37), j4 5 (4-5), j5 4 (4-5), j6 4,
 J2 5 (4-5), J5 5 (5-6), z2 8, z4 7 (6-8), z5 4 (4-5), Z1 6
 (5-7), Z4 58 (56-60), Z5 114 (106-120), s4 50 (48-52), S2
 7 (6-8), S4 5 (4-6), S5 4 (4-5), r3 10 (10-11), R1 6. All
 setae smooth. *Peritreme:* Extending forward to level
 of j1. *Venter:* Ventrianal shield with a few transverse
 striae on the anterior half, 103 (96-106) long, 137
 (133-144) wide at widest level, with 5 pairs of small and
 a pair of large preanal pores. *Spermatodactyl:* Shaft 16
 (14-17) long. *Legs:* macrosetae setiform of the follow-
 ing lengths: SgeI 23 (22-24), SgeII 23 (20-24), SgeIII 25
 (24-26), StiIII 21 (19-23), SgeIV 49 (46-54), StiIV 33
 (30-37), StIV 50 (47-53).

LOCALITY AND TYPE MATERIAL: Holotype,
 2 paratype females and 1 paratype male (USNM), 18
 female and 4 male paratypes, and 5 nymphs (UCR)
 from *Araucaria* sp., Mount Susu Reserve, near Bululo,
 Papua New Guinea, 1-VI-79 (J.A. McMurtry).

Amblyseius paucisetosus McMurtry & Moraes, n.sp.

DIAGNOSIS: This species differs from *Ambly-*
seius waltersi Schicha by its much smaller size (about
 25%) and by lacking seta Z1. As in *A. paucisetosus*,
A. parasundi Blommers, *A. solus* Denmark & Mat-
 thysse and *A. sundi* Pritchard & Baker, do not have
 seta Z1. However, those three species differ from *A.*
paucisetosus by having tubular spermathecae. *A.*
paucisetosus further differs from other *Amblyseius*
 species by lacking the 2 intermediate pairs of postero-
 ventral setae (LV2 and ZV3).

FEMALE: (Figs. 26-28) (1 specimen measured).
Dorsum: Dorsal shield smooth, 307 long, 196 wide at
 widest level of proscutum. Setae j1 20, j3 32, j4 5, j5 4,
 j6 7, J2 8, J5 6, z2 8, z4 7, z5 4, Z1 absent, Z4 53, Z5
 138, s4 53, S2 8, S4 8, S5 8, r3 10, R1 7. All setae
 smooth. Setae r3 and R1 on lateral membrane. *Peri-*
treme: Extending forward to level of j1. *Venter:* Poste-
 rior margin of sternal shield straight. Distances
 between setae ST1-ST3 49, ST2-ST2 52, G-G 49. Ven-
 trianal shield with lateral margins concave, 92 long, 66



Figs. 26-28. *Amblyseius paucisetosus* n. sp. Female: 26. dorsal shield 27. ventral surface 28. spermatheca

wide at level of ZV2, 64 wide at level of anus. Only 2 pairs of setae (ZV1 and JV5) surrounding ventrianal shield. *Chelicera*: Movable digit 35, with 12 or more teeth; fixed digit 31, apparently with 3 teeth. *Spermatheca*: Cervix cup-shaped, 8 long. Atrium globate. *Legs*: Macrosetal lengths: SgeI 35, SgeII 30, SgeIII 24, StiIII 24, SgeIV 54, StiIV 48, StIV 54, all setiform. Chaetotaxy of GeII 2, $\frac{2-2}{0}$, 1; GeIII 1, $\frac{2-2}{1}$, 1. Erect

seta present on tarsus I.

MALE: Unknown.

LOCALITY AND TYPE MATERIAL: Holotype female from *Cryptocarya* sp., Wau, Papua New Guinea, 26-V-79 (J.A. McMurtry), in UCR.

Amblyseius maai Tseng

Amblyseius (Amblyseius) maai Tseng, 1976:123.

SPECIMENS EXAMINED: *Taiwan*: Dar Liao, 27-VIII-78, 2 FF, ex. *Musa* sp.; *Papua New Guinea*: near Wau, Biawin village, 2 FF, ex. *Carica papaya*; W.E.I., 1 F, ex. *Casuarina oligodon*.

PREVIOUS RECORDS: *Taiwan* (Chang & Tseng 1978, Tseng 1976).

REMARKS: Our Papua New Guinea specimens appeared indistinguishable from those from Taiwan. Setal measurements from 3 specimens of our material were nearly identical to those of 3 specimens from Taiwan.

Amblyseius herbicolus (Chant)

Typhlodromus (Amblyseius) herbicolus Chant, 1959:84.

Amblyseius herbicolus, Daneshvar and Denmark, 1982:5.

Amblyseius largoensis, Muma, 1961:287 (in part).

Amblyseius deleoni Muma and Denmark, in Muma, et al., 1970:68; Schicha, 1981:107.

SPECIMENS EXAMINED: *Papua New Guinea*, Morobe Province: Numerous specimens from various localities and host plants: W.E.I., ex. *Tectaria* sp., *Musa* sp., *Pandanus* sp., unidentified Zingabaraceae, *Casuarina oligodon*, *Eucalyptus torrelliana*, *Piper* sp., *Araucaria* sp., *Coffea arabica*, *Lantana* sp. *Persea* sp., *Paspalum obiculare*, *Pinus* sp.; Edie Creek Road: 1200 m. ex. *Ficus* sp., 1400 m. ex. *Cordyline terminalis*; 1600 m ex. *Castanopsis* sp., *Elatostemma* sp.; 1900 m. ex. *Piper* sp.; near Wau, ex. *Cryptocarya* sp.; Bulolo, ex. *Araucaria* sp.

PREVIOUS RECORDS: See McMurtry & Moraes (1984).

REMARKS: McMurtry and Moraes (1984) presented the characters which separate this species from others in the *largoensis* group.

A. herbicolus was the dominant phytoseiid collected in the Wau area. Although it was common on herbaceous plants, it was also collected on large trees, and was the only phytoseiid collected in second-growth *Araucaria* forests in the Bulolo area. This phytoseiid was also recorded from other highland areas of Papua New Guinea (Schicha and Gutierrez, in press). *A. largoensis*, a closely related and common species in the Pacific area, did not occur in our collections although Schicha and Gutierrez recorded it from several localities in Papua New Guinea, mainly lowland areas. *A. herbicolus* apparently extends to higher latitudes than *A. largoensis* (McMurtry and Moraes, 1984). Records from Papua New Guinea suggest that it also extends to higher altitudes than *A. largoensis*.

Genus *Euseius* Wainstein

Amblyseius (Amblyseius) section *Euseius* Wainstein, 1962:15.

Amblyseius (Euseius), DeLeon, 1965:125.

Euseius, DeLeon, 1966:86; Muma et al., 1970:12; McMurtry, 1983:257.

Euseius ovalis (Evans)

Typhlodromus ovalis Evans, 1953:458.

Typhlodromus (Amblyseius) ovalis, Chant, 1959:68.

Amblyseius (Typhlodromalus) ovalis, Muma, 1961.

Euseius ovalis, Gupta, 1978:335.

SPECIMENS EXAMINED: *Papua New Guinea*: W.E.I., 4 FF, ex. *Ricinus communis*; 5 FF, 2 MM, ex. *Eucalyptus torrelliana*; 1 F, ex. *Manihot* sp.; 1 F, ex. *Coffea arabica*; 1 F, ex. *Tectaria* sp.

PREVIOUS RECORDS: *Malaysia* (Evans 1953); *Philippines* (Corpus & Rimando 1966, Swirski & Golan 1967); *Fiji*, *Cook Islands*, *New Guinea* (Collyer 1980); *Mauritius Island* (Moutia 1958); *New Zealand* (Collyer 1964); *Hong Kong* (Ehara & Lee 1971, Swirski & Shechter 1961); *Taiwan* (Chang & Tseng 1978, Ehara 1970, Lo 1970); *China* (Liang & Ke 1983, Wu 1981, 1982); *Japan* (Ehara 1967); *India* (Gupta 1978); *Hawaii* (Chant 1959, Prasad 1968); *Mexico* (Chant 1959) (misidentification?).

REMARKS: Redescriptions of *E. ovalis* were made by Schicha (1977), based on the holotype, and by Ehara (1967), based on material from Okinawa. Mean setal lengths (and ranges) of Papua New Guinea material, based on 6 specimens: j1 31 (30-32), j3 9 (8-10), j4 and j5 6 (5-7), j6 7 (6-7), J2 9 (8-10), J5 6 (5-6), z2 and z4 8 (7-9), z5 6, Z1 7 (6-9), Z4 6, Z5 50 (42-55), s4 11 (10-12), S2 8 (6-10), S4 9 (8-10), S5 8 (7-9), r3 11 (10-12), SgeIV 33 (30-36), StiIV 30 (27-36), StIV 55 (55-58), SgeIII 25 (24-26), cervix of spermatheca 12 (11-12) long. These measurements are generally somewhat shorter than those given by Schicha (1977) and Ehara (1967). The spermatheca resembles the figures of Narayanan et al. (1960), Ehara (1967), and Tseng (1976). The spermatheca was not visible in the holotype (Schicha 1977).

Genus *Iphiseius* Berlese

Iphiseius Berlese, 1921:95.

Iphiseius dinghuensis Wu & Qian

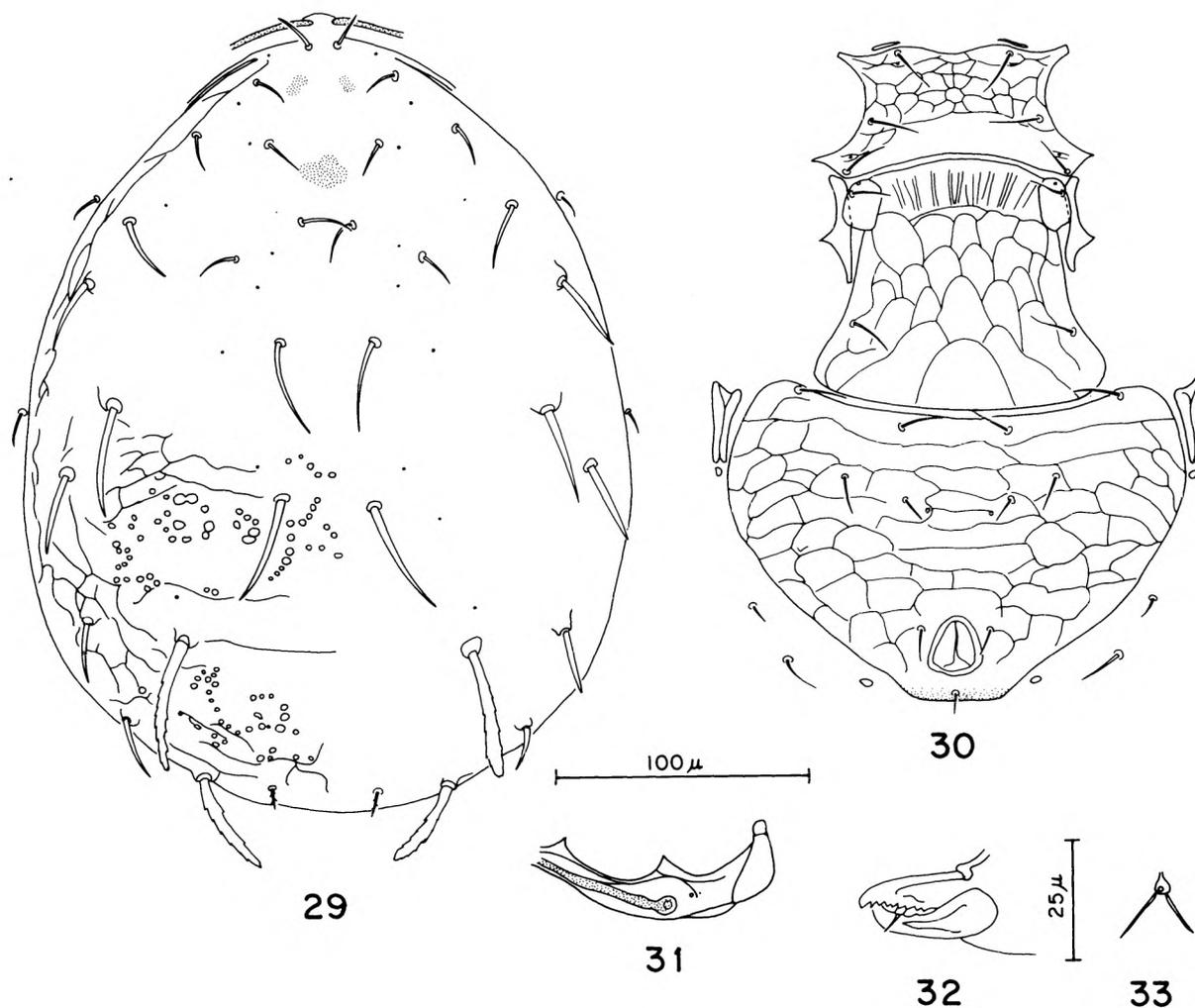
Iphiseius dinghuensis Wu and Qian, 1982:61.

SPECIMENS EXAMINED: *Papua New Guinea*: Wau, W.E.I. 25-V-79, 4 FF, ex. *Coffea arabica*; 1 F, ex. *Araucaria* sp.

PREVIOUS RECORDS: *China* (Wu and Qian, 1982).

REMARKS: A Papua New Guinea specimen is illustrated in Figs. 29-33. Ranges in lengths of setae (4 specimens) are shown in comparison to the measurements in the original description (in parentheses): j1 17-18 (14), j3 18 (20), j4 19-22 (25), j5 24 (28), j6 43-46 (38), J2 48-54 (50), J5 11-12 (19), z2 24-25 (31), z4 31-40 (43), z5 19-20 (20), Z1 48-53 (51), Z4 54-55 (55), Z5 42-46 (50), s4 35-37 (44), S2 38-42 (45), S4 29-31 (38), S5 22-23 (28), r3 16-19 (16), R1 14-18 (10).

I. dinghuensis is very similar to *I. formosanus* Ehara 1970, being distinguished from that species by having longer setae z4, Z1, S4, j4, j5 and J2 (Wu and Qian, 1982).



Figs. 29-33. *Iphiseius dinghuensis* Wu & Qian. Female: 29. dorsal shield 30. ventral surface 31. peritrematal shield 32. chelicera 33. spermatheca

Pending further study and redefinition of *Iphiseius* and certain other genera in Amblyseiinae such as *Paraamblyseius* Muma and *Iphiseiodes* De Leon, we here retain *I. dinghuensis* in the genus under which it was described. The main diagnostic character used for the genus *Iphiseius* is the sclerotization of the lateral membrane from the dorsal shield ventrad to well below the bases of setae r3 and R1 (Chant, 1965). On this basis, the genus contains a heterogeneous assemblage of species, probably of several diverse lineages. Pronounced dissimilarity among species is evident in such features as shape and dentition of chelicerae, width and shape of ventrianal shield and dorsal shield chaetotaxy. For example, *I. degenerans* (Berlese), the type species, has some features in common with *Euseius* (see McMurtry, 1983) including the shape and

dentition of chelicerae, the preanal setae being in a nearly transverse row, and distinctly wider genital shield than ventrianal shield (*I. degenerans* has the unusual condition of separate ventral and anal shields). *I. dinghuensis*, along with *I. formosanus*, *I. mumai* Prasad and *I. gongylus* Pritchard & Baker, all have extremely wide ventrianal shields, but vary from one another in the number of j-J setae and relative lengths of some setae on the dorsal shield. *I. modestus* Chant and Baker and *I. robustus* Chant and Baker have relatively narrow ventrianal shields and wider genital shields, and dorsal shield chaetotaxy typical of *Amblyseius*. There are 13 other species which were originally described in the genus *Iphiseius*. Chant et al. (1978) considered *Iphiseius* as a part of *Amblyseius*.

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