RHODACARIDAE (ACARI : MESOSTIGMATA) FROM NEAR ADELAIDE, AUSTRALIA

I. SYSTEMATICS

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ABSTRACT

Twenty-five species of Rhodacaridae belonging to 14 genera are listed as collected from the environs of Adelaide, South Australia. Two new genera (*Athiasella* and *Solugamasus*) and 12 new species (*Gamasiphis lenifornicatus, G. saccus, Geogamasus minimus, Gamasellus cophinus, G. grossi, Acugamasus elachyaspis, Hiniphis bipala, Rhodacaroides minyaspis, Solugamasus mustela, Antennolaelaps aremenae, A. celox, Onchogamasus virguncula*) are described. The description of adult *Gamasellus concinnus* (Womersley, 1942) is extended and measurements are given for adults of all listed species. The larvae of 4 species (*Gamasiphoides propinquus, Gamasellus concinnus, G. cophinus, Acugamasus semipunctatus*) are described.

INTRODUCTION

The Rhodacaridae is a group of mainly free-living, ground inhabiting, predatory mites, most common and diverse in form in Southern Temperate regions.

The present study on Systematics formed part of a thesis for the degree of M.Sc., University of Adelaide, on rhodacarids from the environs of Adelaide, South Australia. Further papers will deal with the Ecology (part II) and Behaviour (part III) of these mites.

The rhodacarids studied were from 4 sites between the summit of Mount Lofty and the coast-line of the Adelaide Plain. The "*Sites*", to be described more fully in part II, are as follows:—

(1) *Summit.* Approximately 18 km from the sea. Near the summit of Mount Lofty (715 m), the highest hill overlooking the Adelaide Plain.

(2) *Foothills.* Approximately 16 km from the sea. Near the First Waterfall, at the head of the deepest stretch of Waterfall Gully which has recently eroded back from where First Creek flows from the foothills below Mount Lofty on to the Adelaide Plain.

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(3) *Plains*. Approximately 8 km from the sea. Heywood Park Unley; a suburban park on the Adelaide Plain.

(4) *Coastal*. Approximately 1.5 km from the sea. Grange Golf Course.

The terminology and diagnoses of taxa are as used by Lee (1970) except when otherwise indicated. Measurements are in micrometres, to the nearest 5 for lengths and 2.5 for breadths. The idiosomal length given is the average followed in parentheses by the number of specimens measured and the range of their lengths. Other measurements given for a specimen near to the average length are the lengths and breadths of the movable cheliceral digit (*ch*), the palp (*pa*) and the legs (*I*, *II*, *III* or *IV*).

Specimens selected for description have been registered in the collection of the South Australian Museum.

Family RHODACARIDAE Oudemans, 1902

Subfamily RHODACARINAE Oudemans, 1902

Genus RHODACARUS Oudemans, 1902

Rhodacarus roseus Oudemans

Rhodacarus roseus Oudemans, 1902, p. 50.

FEMALE. Not figured.

Measurements: idiosomal length—275 (1 from Summit Site) or 490 (3 from Plains Site, 450-510, measured for appendage lengths and genu breadths); appendage lengths—*ch* 100, *pa* 140, *I* 405, *II* 285, *III* 245, *IV* 360; genu breadths—*pa* 22.5, *I* 25, *II* 32.5, *III* 27.5, *IV* 32.5. The female from the Summit Site differs from previously described specimens from the Plains Site in being smaller with very indistinct punctations on the idiosoma and an opisthonotal seta *Z*3 of similar length to seta *Z*2 rather than to *Z*5.

MALE. Not figured.

LOCAL. *Summit Site*—female (197061), moss, 26.4.1968. *Plains Site*—3 females (N196879-N196881).

REMARKS. Specimens of *R. roseus* from the Plains Site have already been described (Lee, 1970, p. 29). One smaller female, differing from these as indicated above, was collected from the Summit Site and is for the time being regarded as belonging to the same species. This species has also been recorded from the Palaearctic region.

Genus RHODACARELLUS Willmann, 1935

Rhodacarellus silesiacus Willmann

Rhodacarellus silesiacus Willmann, 1936, p. 282.

FEMALE. Not figured.

Measurements: idiosomal length—305 (1); appendage lengths—*ch* 30, *pa* 90, *I* 230, *II* 140, *III* 115, *IV* 200; genu breadths—*pa* 17.5, *I* 22.5, *II* 27.5, *III* 22.3, *IV* 25. The general appearance is as given for this species by Sheals (1958), but at the posterior end of the idiosoma the setal lengths and markings on the shields conform to those figured for this species by Athias-Henriot (1961, figs. 283, 284 and 291).

MALE. Not collected.

LOCAL. *Foothills Site*—female (N197062), moss, 9.5.1968.

REMARKS. The only previous record of *Rhodacarellus* occurring in Australia is of a female (N1968280) from Millicent, about 400 km south of Adelaide (Lee, 1970), which I have since identified as *R. silesiacus*. This species has also been recorded from the Nearctic and Palaearctic regions.

Subfamily GAMASIPHINAE Lee, 1970

Genus GAMASIPHIS Berlese, 1904

Gamasiphis australicus Womersley

Gamasiphis (*Heteroiphis*) *australicus* Womersley, 1956a, p. 521.

FEMALE. Not figured.

Measurements: idiosomal length 390 (3 from Foothills Site, 360-430); appendage lengths—*ch* 40, *pa* 100, *I* 290, *II* 250, *III* 190, *IV* 265; genu breadths—*pa* 17.5, *I* 22.5, *II* 30, *III* 22.5, *IV* 22.5.

MALE. Not figured.

LOCAL. *Foothills Site*—3 *females* (N197063-N197065), moss or plant litter, 7.1968-2.1969. *Plains Site.*

REMARKS. *G. australicus* from the Plains Site is described (Lee, 1970, p. 50) and appears to be identical with specimens from the Foothills Site. The only other record of this species is of the type which was collected at Mylor, about 8 km south of the Summit Site.

Gamasiphis fornicatus Lee

Gamasiphis fornicatus Lee, 1970, p. 51.

FEMALE. Not figured.

Measurements: idiosomal length—500 (20, 480-510); appendage lengths—*ch* 72, *pa* 165, *I* 360, *II* 310, *III* 305, *IV* 385; genu breadths—*pa* 20, *I* 25, *II* 42.5, *III* 30, *IV* 30.

MALE. Not figured.

Measurements: idiosomal length—490 (6, 470-490).

LOCAL. *Summit Site*—10 females (N197066-N197075) and 3 males (N197076-N197078), moss or plant litter, 1968-1969. *Foothills Site*—14 females (N197079-N197092) and 4 males (N197093-N197096), moss or plant litter, 1968-1969.

REMARKS. *G. fornicatus* is also recorded from Mount Remarkable, about 260 km north of the Summit Site. No differences were noticed between the type specimens and those from near Adelaide.

Gamasiphis lenifornicatus Lee, n.sp.

FEMALE. Fig. 1; A,B,C,D,E.

Measurements: idiosomal length—390 (1); appendage lengths—*ch* 40, *pa* 135, *I* 305, *II* 225, *III* 220, *IV* 305; genu breadths—*pa* 17.75, *I* 22.25, *II* 30, *III* 25, *IV* 25. One pair of pre-endopodal shields. Split between exopodal and peritrematal shields does not extend posterior to stigma, and the peritrematal shield is broadly fused to the notal shield. No conspicuous lateral fissure on notal shield. Leg chaetotaxy is abnormal for rhodacarids (not as *Gamasellus*) in lacking 3 setae on leg IV; seta *pl* on the genu (2, 5/2, 0); setae *pd* 2 and *pl* 2 on the tibia (2, 4/2, 1). The tectum is conspicuously fimbriated. The idiosoma is acutely convex dorsally and the dorsal setae are unusually long. Sternal setae are nearly in a straight line so that a line joining setae *st*2, *st*3 and *st*4 enclose an angle of more than 95°; excepting the atypical *Hydrogamasus* this is a unique attribute within the Gamasiphinae. On legs II-IV, tarsal setae *ad*1 and *pd*1 are subequal in length to pretarsus and bear a broad hyaline flap.

MALE. Fig. 1; F,G,H.

Measurements: idiosomal length—350 (6, 340-370). The distribution of shields is as for the female except on the venter of the podosoma. The spermadactyl is slightly longer than the movable cheliceral digit, and has a hyaline, spatulate tip. On leg II, setae *av* on the femur and genu are modified to spurs.

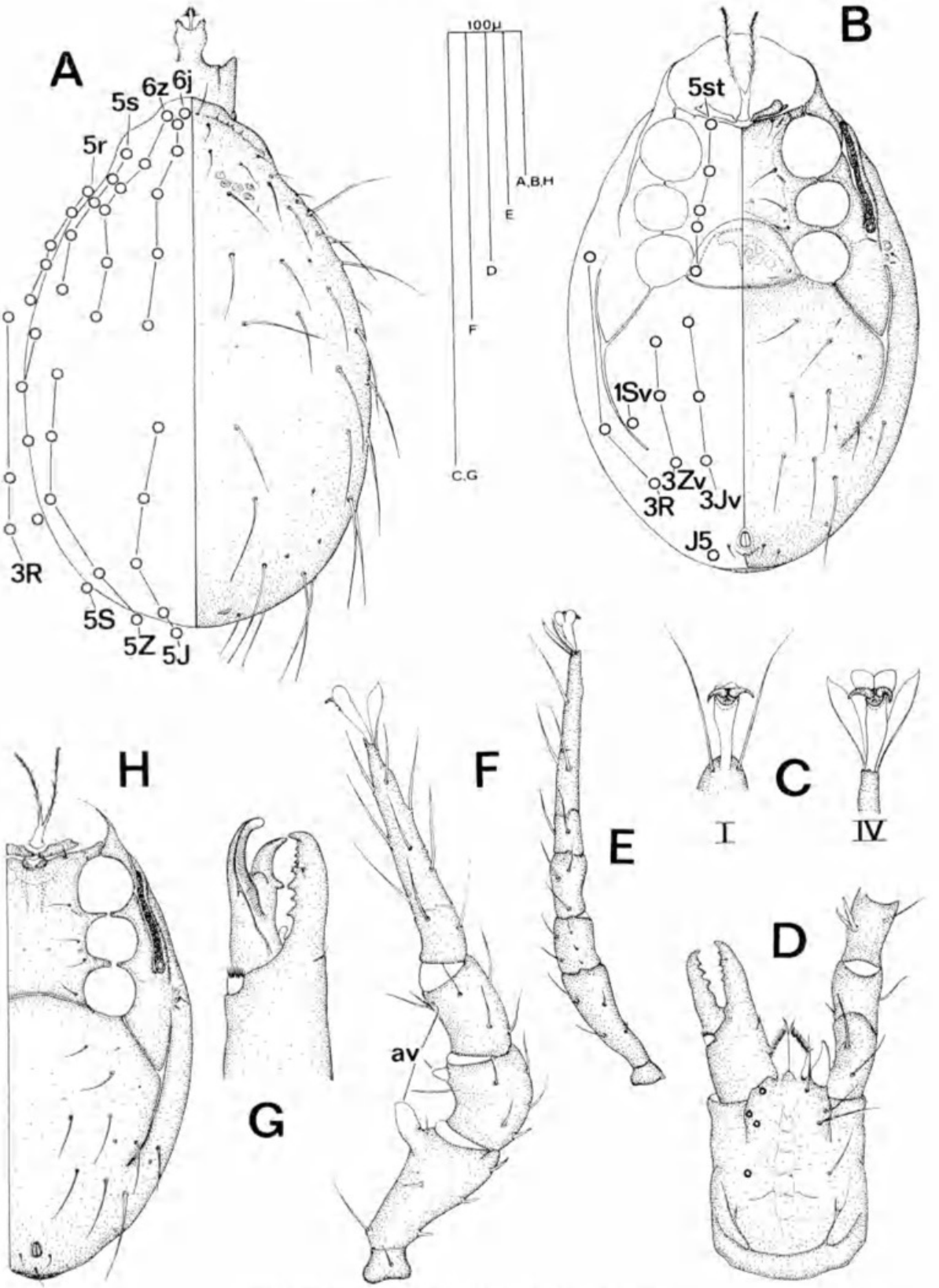

Fig. 1. *Gamasiphis lenifornicatus* n.sp.

A-E, female: A, soma, dorsum; B, idiosoma, venter; C, pretarsi I and IV; D, gnathosoma, venter; E, leg IV (part), dorsal setae.

F-H, male: F, leg II (part), antero-lateral; G, chelicera; H, idiosoma, venter.

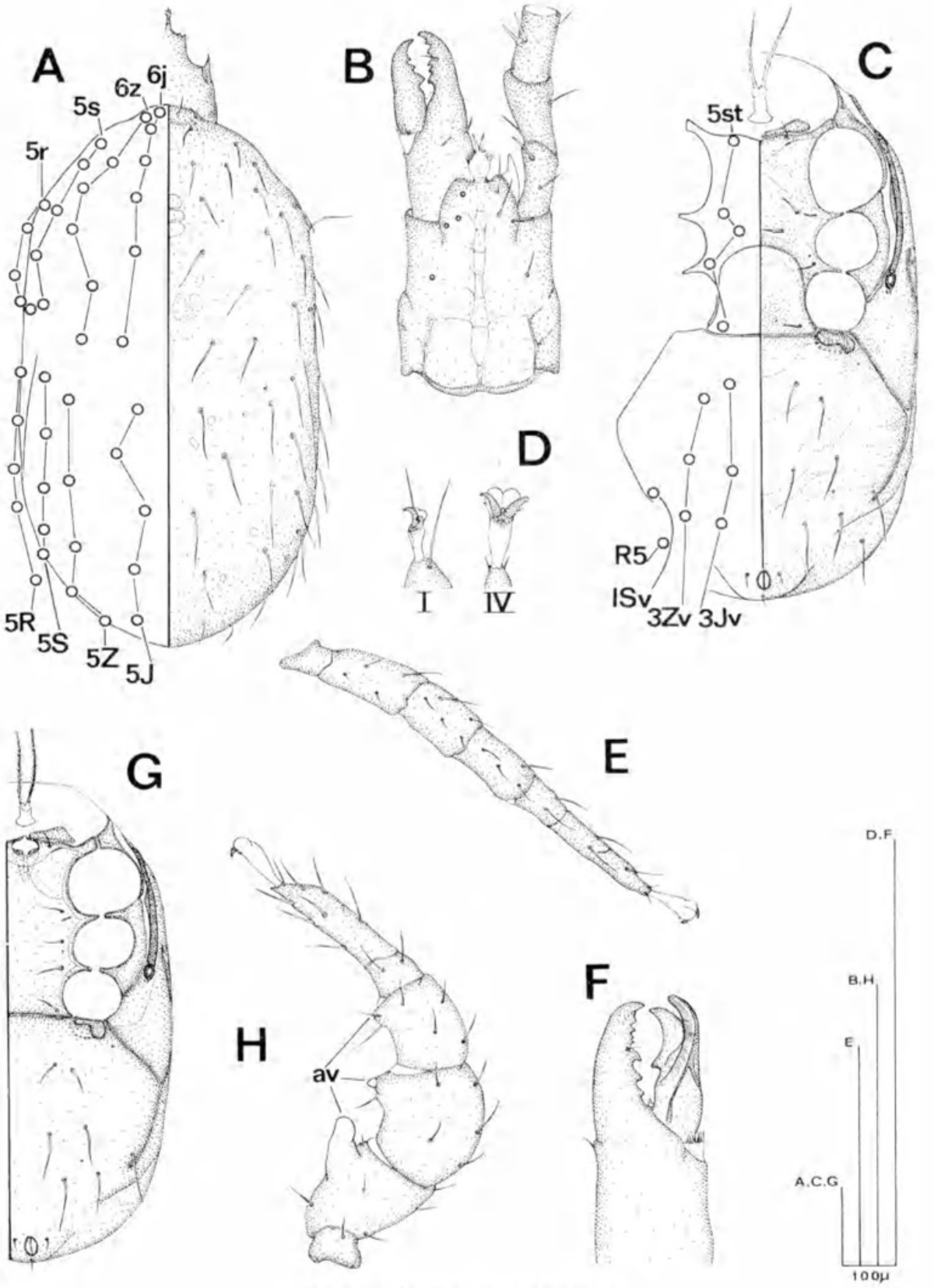

Fig. 2. *Gamasiphis saccus* n.sp.

A-E, female: A, soma, dorsum; B, gnathosoma, venter; C, idiosoma, venter; D, pretarsi I and IV; E, leg IV (part), dorsal setae.

F-H, male: F, chelicera; G, idiosoma, venter; H, leg II (part), antero-lateral.

LOCAL. *Summit Site*—holotype female (N197097) and allotype male (N197098), plant litter, 24.4.1969; and 5 paratype males (N197099-N1970103), moss or plant litter, 6-8.1968.

REMARKS. The idiosoma of *G. lenifornicatus* is globular, but to a lesser degree to that of *G. fornicatus*. The leg chaetotaxy is unique amongst rhodacarids in lacking seta *pd*2 on the adult tibia IV. The male tibia II is unusual within the genus (*G. saccus* n.sp. is the only other species of *Gamasiphis* with this attribute) in having a setose seta *av*.

Gamasiphis saccus Lee, n.sp.

Female. Fig. 2; A,B,C,D,E.

Measurements: idiosomal length—350 (3, 350-360); appendage lengths—*ch* 40, *pa* 120, *I* 270, *II* 210, *III* 190, *IV* 240; genu breadths—*pa* 15, *I* 22.5, *II* 32.5, *III* 25, *IV* 25. One pair of pre-endopodal shields. Split between exopodal and peritrematal shields extends backward from stigma to divide exopodal IV. Lateral fissure runs almost parallel to edge of opisthonotal shield. Leg chaetotaxy is normal for rhodacarids (as *Gamasellus*). The idiosoma is unusually flattened dorsally for a species of *Gamasiphis*. There is a conspicuous pit on the anterior edge of the ventro-anal shield bordering acetabulum IV. This pit appears to be lined by a fine pile. On legs II-IV, tarsal setae *ad*1 and *pd*1 are simple and less than a quarter of the length of the pretarsus.

MALE. Fig. 2; F,G,H.

Measurements: idiosomal length—340 (3, 330-350). The distribution of shields is as for the female except on the venter of the podosoma. Spermadactyl is slightly longer than the movable cheliceral digit and, although blunter, similar in shape. On leg II, setae *av* on the femur and genu are modified to spurs.

LOCAL. *Summit Site*. *Foothills Site*—holotype female (N1970104), allotype male (N1970105), 2 paratype females (N1970106 and N1970107) and 2 paratype males (N1970108 and N1970109), moss, 21.6.1968.

REMARKS. *G. saccus* is easily recognized by the large pit on the posterior edge of acetabulum IV. It is also unique amongst species of *Gamasiphis* in having the same leg chaetotaxy as *Gamasellus*. Specimens from the Summit Site are indistinguishable from those described.

Genus EUEPICRIUS Womersley, 1942

Euepicrius filamentosus Womersley

Euepicrius filamentosus Womersley, 1942, p. 170.

FEMALE. Not figured.

Measurements: idiosomal length—500 (10, 470-550); appendage lengths—*ch* 60, *pa* 140, *I* 755, *II* 445, *III* 440, *IV* 490; genu breadths—*pa* 22.5, *I* distal 25, *II* 45, *III* 42.5, *IV* 47.5.

MALE. Not figured.

Measurements: idiosomal length—490 (10, 460-530).

LOCAL. *Summit Site. Foothills Site*—10 females (N1970110-N1970119) and 10 males (N1970120-N1970129), moss or plant litter, 1968-1969.

REMARKS. The above specimens of *E. filamentosus* are indistinguishable from the type specimens (N1970130-N1970139) which are from Glen Osmond and Long Gully (2 localities within 8 km of the Foothills Site). A female of an undescribed species from Waimamaku, New Zealand, was incorrectly listed as belonging to *E. filamentosus* in the original description.

Genus GAMASIPHOIDES Womersley, 1956a

Gamasiphoides propinquus Womersley

Gamasiphis (*Gamasiphoides*) *propinqua*[1] Womersley, 1956a, p. 528.

FEMALE. Not figured.

Measurements: idiosomal length—800 (5, 780-840, measured for appendage lengths and genu breadths) or 600 (2); appendage lengths—*ch* 80, *pa* 220, *I* 570, *II* 430, *III* 420, *IV* 550; genu breadths—*pa* 35, *I* 47.5, *II* 60, *III* 50, *IV* 55.

MALE. Not figured.

Measurements: idiosomal length—730 (4, 720-730) or 540 (1).

LARVA. Fig. 3; A,B,C,D,E,F.

Measurements: idiosomal length—320 (4, 270-350). Seta *al* on palp genu is spatulate. Tectum anterior margin is basically trispinate with numerous spinules, and the three spines are of approximately equal size. Idiosomal shields clearly defined. Idiosomal setae are simple. Opisthonotal seta *Z*3 (*Z*1 and *Z*2 are absent) is about half as long as seta *Z*4.

[1] Mr. R. Domrow of Queensland has pointed out (private correspondence: 30.9.1970) that according to the International Code of Zoological Nomenclature, Art. 30 (*a*) (ii), *oides* is masculine and therefore the original ending of this species name should be changed.

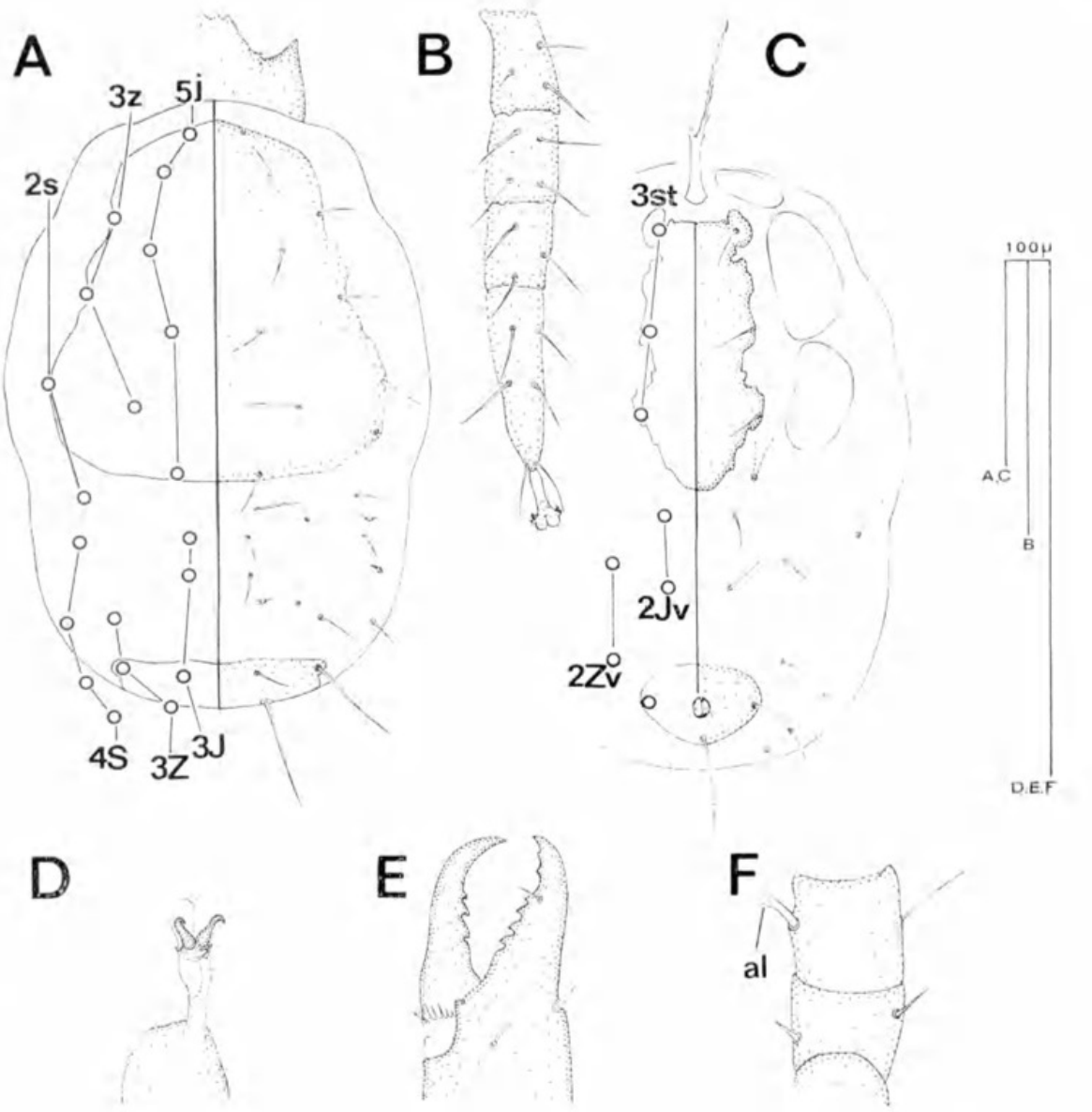

Fig. 3. *Gamasiphoides propinquus* (Womersley)

A-F, larva: A, soma, dorsum; B, leg III (part), dorsal setae; C, idiosoma, venter; D, pretarsus I; E, chelicera; F, palp femur and genu, venter.

LOCAL. *Summit Site*—5 normal-sized females (N1970145, N1970146, N1970150-N1970152), 4 normal-sized males (N1970147, N1970148, N1970153, N1970154) and 4 larvae (N1970159-N1970162), plant litter, 5.1968-1.1969; 2 small females (N1970142 and N1970143) and 1 small male (N1970144), plant litter, 2-4.1969.

REMARKS. Most of the above specimens are indistinguishable from the types of *G. gamasiphoides,* collected from Belair National Park about 8 km south of the Summit Site, and from specimens described by Lee (1970,

p. 63), collected higher up Mount Lofty than the Summit Site. Specimens only distinguishable by their smaller size were collected at the end of the summer dry season, a period during which normal-sized adults have not, as yet, been found.

Subfamily OLOGAMASINAE Ryke, 1962

Tribe OLOGAMASINI

Genus ATHIASELLA Lee, n.gn.

Heydeniella Richters, *dentata*-complex: Lee, 1970, p. 101.

Type-species: *Hydrogamasus dentatus* Womersley, 1942.

DIAGNOSIS. Small to large mites. Holonotal shield. Ventro-anal shield of female discrete, while on male it is usually fused to the notal shield and always fused to peritrematal and expodal IV shields. Sterno-metasternal shield of female never fused to endopodal IV shield. Single pair of pre-endopodal shields. Twenty pairs of podonotal setae. Leg chaetotaxy may be normal for rhodacarids (as *Gamasellus*) but usually there is one less ventral seta on genu IV (2, 5/1, 1). On palp genu, seta *al*1 pectinate with at least 12 lateral prongs and seta *al*2 broadly cuneate in distal half. Dorsal setae all simple, tapering. Spermathecal access duct opens distally on dorsal surface of trochanter III. Spermadactyl is never conspicuously longer than the movable cheliceral digit and lies parallel to it. The male corniculus is slightly attenuated and on a raised base. On the male leg II at least setae *av* on the femur, genu and tibia are modified to spurs. Pretarsus I is pedunculate and conspicuously smaller than other pretarsi. Legs I and IV are long (0.90 or more of idiosomal length) and there is considerable variation in leg thickness (using breadth of genu: I is 0.65 or less of II; III is 0.85 or less of IV).

REMARKS. Nominate species of *Athiasella* were grouped (Lee, 1970) in the *dentata*-complex of *Heydeniella*. These species are however distinguishable from species of *Heydeniella* by the recognizable location of the orifice to the spermathecal access duct, the discrete female ventro-anal shield and the modification of seta *av* on the male tibia II to a spur.

Athiasella dentata (Womersley)

Hydrogamasus dentatus Womersley, 1942, p. 149.

Heydeniella dentata (Womersley): Lee, 1970, p. 105.

FEMALE. Not figured.

Measurements: idiosomal length—740 (14, 720-780); appendage lengths—*ch* 125, *pa* 270, *I* 750, *II* 570, *III* 520, *IV* 790; genu breadths—*pa* 35, *I* 42.5, *II* 82.5, *III* 47.5, *IV* 60.

MALE. Not figured.

LOCAL. *Summit Site*. *Foothills Site*—14 females (N1970163-N1970176), plant litter, 27.3.1969. *Plains Site*.

REMARKS. All stages of *A. dentata* from the Foothills Site have been described (Lee, 1970), and except for slight variations in their size are indistinguishable from specimens from the other sites. So far, specimens with a long "tooth" on trochanter IV (includes types) have only been collected on the Adelaide Plain or in the Mount Lofty Ranges. A form with a shorter "tooth" is found in the Flinders Ranges and the Hummock Ranges at localities 120-280 km north-west of the Foothills Site (Lee, 1970).

Athiasella relata (Womersley)

Hydrogamasus relatus Womersley, 1942, p. 151, not *Hydrogamasus relatus*: Womersley, 1956a, p. 530.

FEMALE. Not figured.

Measurements: idiosomal length—540 (8, 510-570); appendage lengths—*ch* 95, *pa* 205, *I* 540, *II* 390, *III* 345, *IV* 510; genu breadths—*pa* 27.5, *I* 30, *II* 50, *III* 32.5, *IV* 42.5.

MALE. Not figured.

Measurements: idiosomal length—540 (9, 520-550).

LOCAL. *Summit Site* and *Foothills Site*—8 females (N1970181-N1970188) and 9 males (N1970189-N1970197), moss or plant litter, 4-9.1968. *Plains Site*.

REMARKS. *A. relata* is similar to *A. dentata*, but smaller and the female lacks a conspicuous "tooth" on trochanter IV, while the male has a straight, needle-like spermadactyl (Womersley, 1942, fig. 6A). *A. relata* has only been previously recorded from Glen Osmond which is close to the Foothills Site. Specimens of an undescribed species from Taringa, Queensland, were incorrectly listed as belonging to *A. relata* by Womersley (1956a).

Genus GEOGAMASUS Lee, 1970

Geogamasus howardi Lee

Geogamasus howardi Lee, 1970, p. 96.

FEMALE. Not figured.

Measurements: idiosomal length—330 (10, 310-340); appendage lengths—*ch* 40, *pa* 125, *I* 300, *II* 220, *III* 180, *IV* 295; genu breadths—*pa* 15, *I* 17.5, *II* 33, *III* 22.5, *IV* 25.

MALE. Not figured.

Measurements: idiosomal length—310 (10, 300-320).

LOCAL. *Summit Site*—10 females (N1970198-N1970207) and 10 males (N1970208-N1970217), plant litter, 9.1968. *Foothills Site.*

REMARKS. The above specimens are slightly larger than the types from Mount Burr, about 400 km south of the Summit Site, which is the only other locality record of the species.

Geogamasus minimus Lee, n.sp.

FEMALE. Fig. 4; C.

Measurements: idiosomal length—260 (10, 250-270); appendage lengths—*ch* 25, *pa* 95, *I* 245, *II* 170, *III* 140, *IV* 200; genu breadths—*pa* 12.5, *I* 15, *II* 27.5, *III* 17.5, *IV* 22.5. Similar to *Geogamasus howardi* but two characters are conspicuously different. There is a broad strip of striated cuticle between the ventro-anal shield and the exopodal IV shield, which is subequal to the distance between the genital seta (*st*5) and the posterior margin of the genital shield. On genu IV there is no seta *pv*.

MALE. Fig. 4; B,D.

Measurements: idiosomal length—240 (10, 220-250). Similar to *G. howardi* but three male characters are conspicuously different. The spermadactyl has no elaborate hinge, although it can coil up. On trochanter II, seta *al* is enlarged, bent into an "L" shape and spatulate, but the distal limb is less than twice the length of the proximal limb. On tarsus II, the ridge that is regarded as homologous to seta *ad*3 borders a conspicuous ventro-lateral depression.

LOCAL. *Summit Site*—holotype female (N1970218), allotype male (N1970219), 11 paratype females (N1970220-N1970230) and 11 paratype males (N1970231-N1970241), moss or plant litter, 1968-1969. *Foothills Site.*

REMARKS. *G. minimus* is smaller, and more like the only other nominal species of *Geogamasus* from Australia—*G. howardi*—than the South American species. *G. minimus* is unique in *Geogamasus* in having fewer leg setae than *Gamasellus*. Specimens from the Foothills Site are indistinguishable from those described.

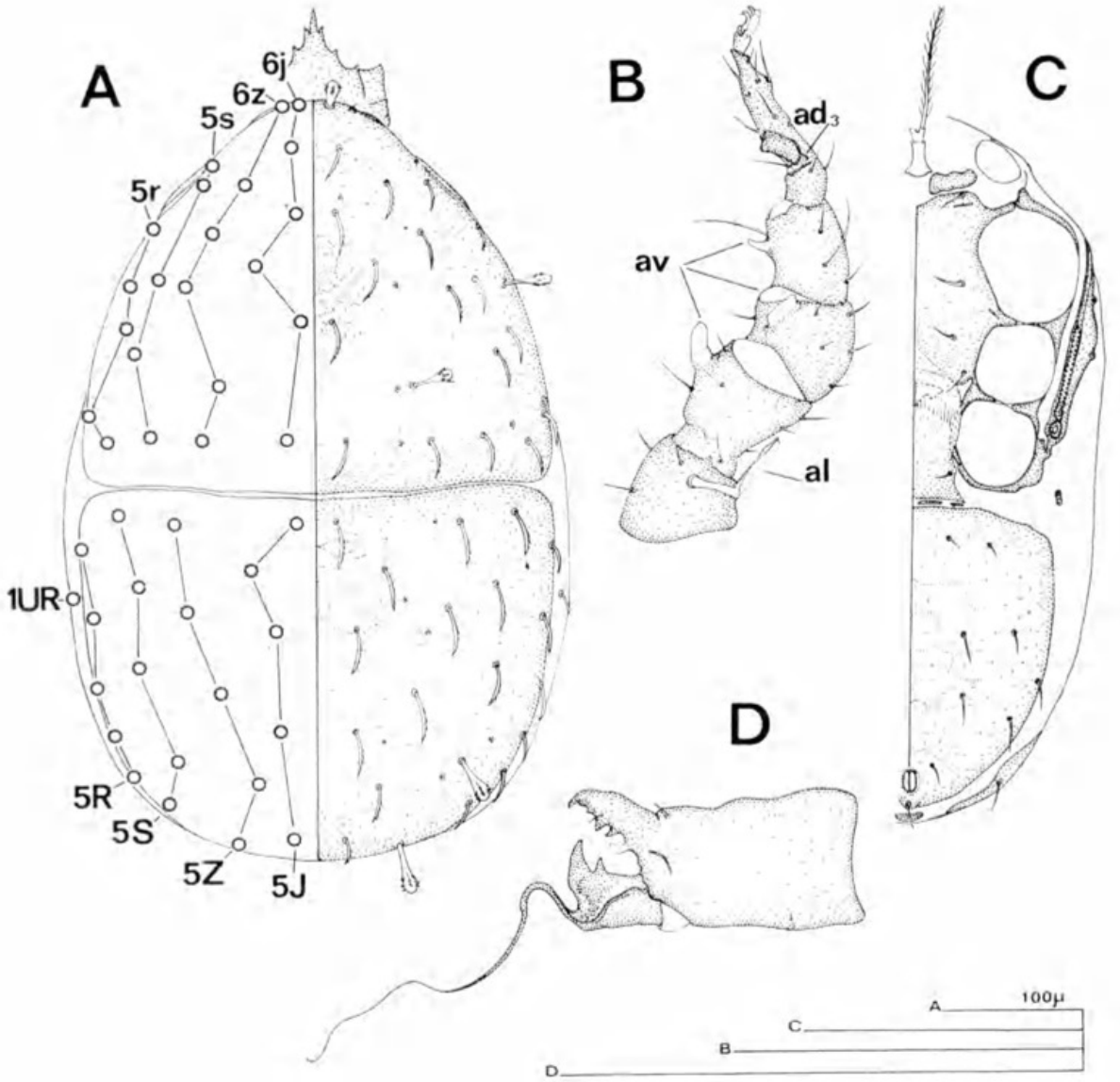

Fig. 4. *Gamasellus grossi* n.sp. and *Geogamasus minimus* n.sp.

A, *G. grossi*, female, soma, dorsum.

B-D, *G. minimus*: B, male leg II (part), antero-lateral; C, female idiosoma, ventral; D, male chelicera.

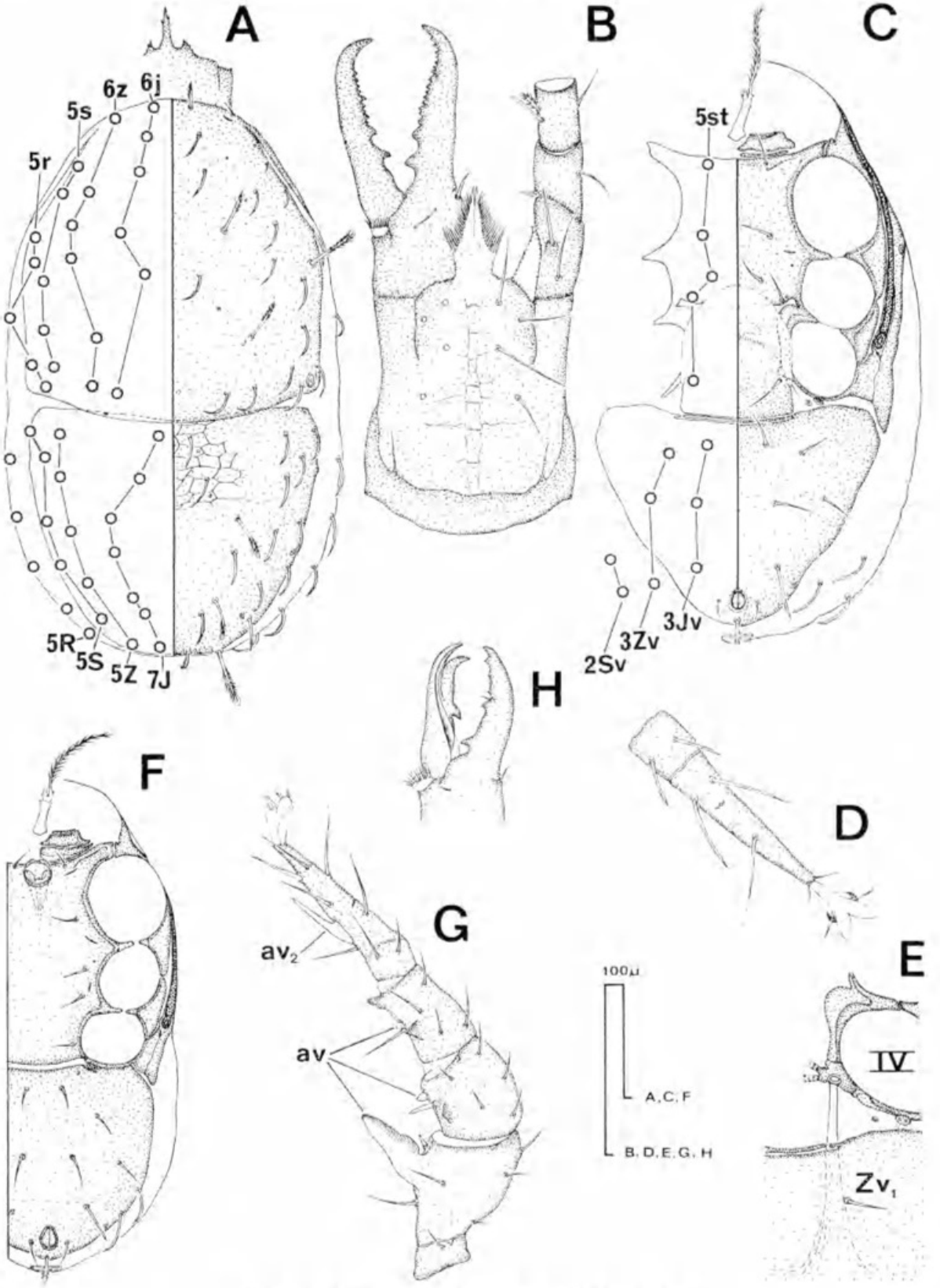

Fig. 5. *Gamasellus concinnus* (Womersley)

A-E, female: A, soma, dorsum; B, gnathosoma, venter; C, idiosoma, venter; D, tarsus IV, dorsal setae; E, region of acetabulum IV, showing spermathecal access tube.

F-H, male: F, idiosoma, venter; G, leg II (part), antero-lateral; H, chelicera.

Tribe GAMASELLINI Hirschmann, 1962
Genus GAMASELLUS Berlese, 1892
FALCIGER-complex

Gamasellus concinnus (Womersley)

?Digamasellus concina Womersley, 1942, p. 159.
Digamasellus concinna Womersley: Womersley, 1956a, p. 537.
Cyrtolaelaps concinnus (Womersley): Womersley, 1961, p. 194.

FEMALE. Fig. 5; A,B,C,D,E.

Measurements: idiosomal length—500 (10, 490-510); appendage lengths—*ch* 105, *pa* 180, *I* 550, *II* 400, *III* 340, *IV* 475; genu breadths—*pa* 25, *I* 27.5, *II* 52.5, *III* 37.5, *IV* 47.5. Three pairs of pre-endopodal shields; the anterior and posterior pairs are slim and inconspicuous, the former so much so that it was not noted in the original description. The peritrematal shield is separate from the ventro-anal shield; this agrees with original description but not with my examination of the holotype which has a narrow strip of shield connecting the posterior point of the peritrematal shield to the ventro-anal shield. There is a reduction in the extent of the opisthosomal shields so that the dorsal setae in row *R* and ventral seta *Zv*3 are on striated cuticle. Podonotal seta *z*1 is setose and inconspicuous, and not similar to *j*1 as originally described. Seta *al*1 on the palp genu has 6 lateral prongs. The dorsal setae on the tarsi are either setose or slightly lanceolate in contrast to most such setae on other Australian species in the *Gamasellus falciger*-complex which are conspicuously spatulate.

MALE. Fig. 5; F,G,H.

Measurements: idiosomal length—470 (10, 450-480). Posterior pair of pre-endopodal shields is as large as the central pair. The ventro-anal shield is fused to exopodal IV shield and is larger than on the female since it carries 2 more pairs of setae (*Zv*3 and *Sv*1). On leg II, setae *av* or *av*2 on the femur, genu, tibia and tarsus are modified to spurs; seta *pv* on the femur and genu are spine-like; and there are non-setous spurs on the genu and tibia.

LARVA. Fig. 7; A,B,C,D,E,F.

Measurements: idiosomal length—230 (10, 210-250). Seta *al* on palp genu is spine-like with 6 lateral prongs. Tectum anterior margin is basically trispinate with spinules, and central spine is longer than lateral spines. Sternal shield not clearly defined. Idiosomal setae are simple or, if long, faintly pilose. Opisthonotal seta *Z*3 (*Z*1 and *Z*2 are absent) is subequal to seta *Z*4. There are 12 or more teeth on fixed cheliceral digit.

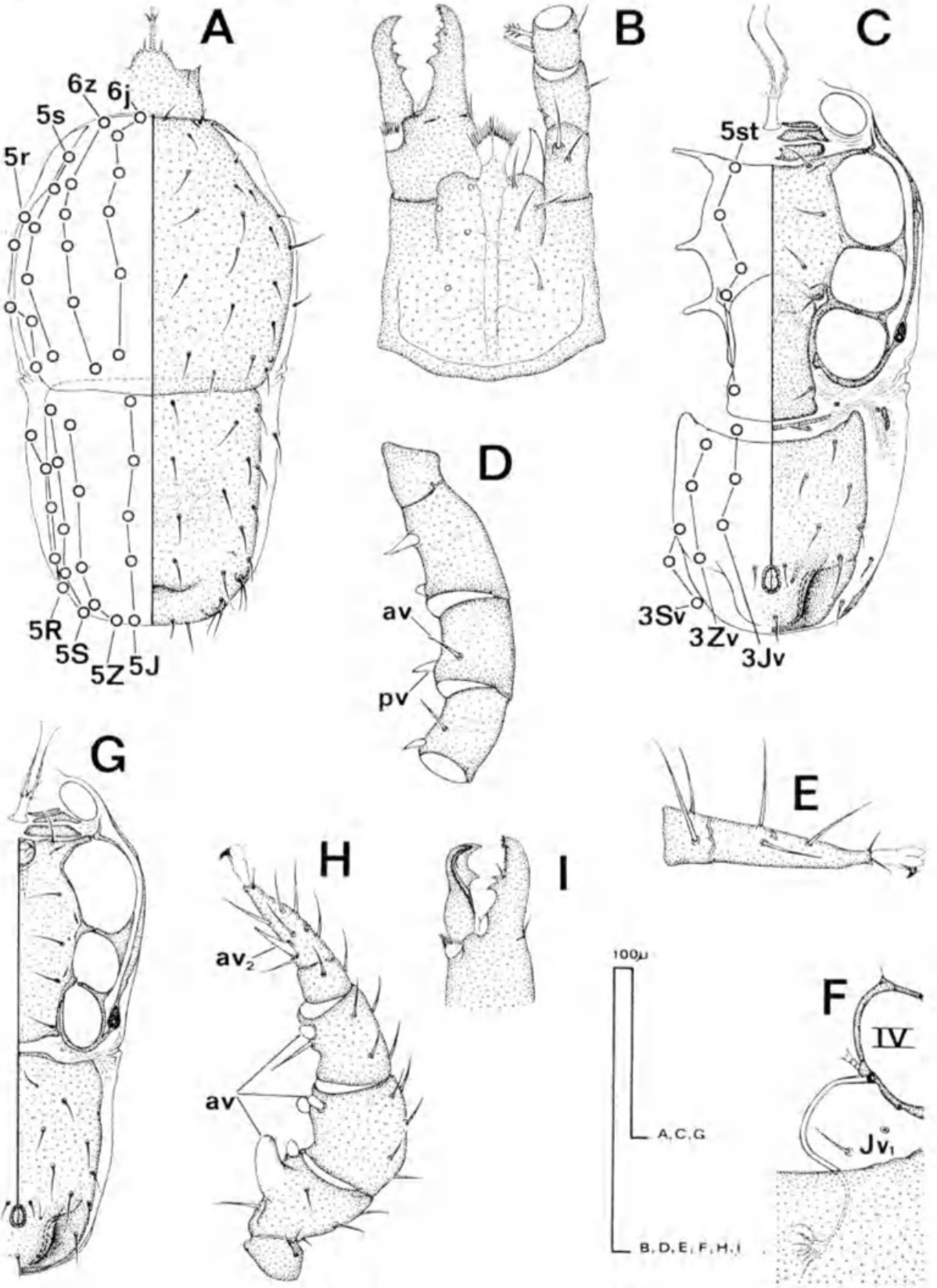

Fig. 6. *Gamasellus cophinus* n.sp.

A-F, female: A, soma, dorsum; B, gnathosoma, venter; C, idiosoma, venter; D, leg IV (femur-tibia), antero-lateral; E, tarsus IV, dorsal setae; F, region of acetabulum IV, showing spermathecal access tube.

G-I, male: G, idiosoma, venter; H, leg II (part), antero-lateral; I, chelicera.

LOCAL. *Summit Site*—10 females (N1970244-N1970253), 10 males (N1970254-N1970263), larva containing protonymph (N1970264) and 16 other larvae (N1970265-N1970280), moss or plant litter, 1968 and 1969. *Foothills Site*.

REMARKS. The above specimens are indistinguishable from the holotype female (N1970242) and allotype male (N1970243) collected from Belair National Park (the only other locality record of this species) about 8 km south of the Summit Site, except that the peritrematal shield on the female is separate from the ventro-anal shield. The unequal leg proportions of *G. concinnus* resemble those of *Athiasella* rather than of characteristic species of *Gamasellus* (*e.g.*, *G. tragardhi*) in which the legs are subequal in size. The larva is easily distinguished from the rhodacarid larvae collected near Adelaide by its large number of cheliceral teeth.

Gamasellus cophinus Lee, n.sp.

FEMALE. Fig. 6; A,B,C,D,E,F.

Measurements: idiosomal length—310 (10, 290-310); appendage lengths—*ch* 45, *pa* 90, *I* 265, *II* 180, *III* 160, *IV* 220; genu breadths—*pa* 15, *I* 20, *II* 27.5, *III* 20, *IV* 27.5. The distribution of ventral idiosomal shields is similar to other members of the *falciger*-complex, but less extensive in that the peritrematal shield is slim, and the ventro-anal shield does not extend laterally to merge with the metapodal shield nor anteriorly to carry seta *Jv*1. The chaetotaxy is as for the *falciger*-complex except on the opisthosoma where the homologies are not clear (possibly the extra seta in row *Sv* is homologous with the seta previously labelled UR1—see Lee, 1970, fig. 281). Seta *al*1 on the palp genu has 6 lateral prongs as in *Gamasellus concinnus*, but the prongs are proportionately larger. The idiosoma is dorso-ventrally flattened and sub-rectangular in outline. At the posterior end of the opisthosoma there is a ridge on both the dorsal and ventral shields. The ventral ridge is the most heavily sclerotized and convoluted. *G. cophinus* is unique within the genus in having only setose dorsal setae on the adult with no recognizable adhesive exudate on the notum. Leg IV is large and has a number of stout, spine-like ventral setae.

MALE. Fig. 6; G,H,I.

Measurements: idiosomal length—280 (10, 270-290). The ventro-anal shield extends further forward than in the female so that it carries seta *Jv*1, but there is still a substantial strip of striated cuticle between it and the ventral shields on the podosoma. The spermadactyl lies close to the movable cheliceral digit, but distally to the single tooth they are separated. On leg II, setae *av* on the femur, genu, tibia, seta *av*2 on the tarsus, seta *pv*1 on the femur and seta *pv* on the genu are enlarged into spurs or spines.

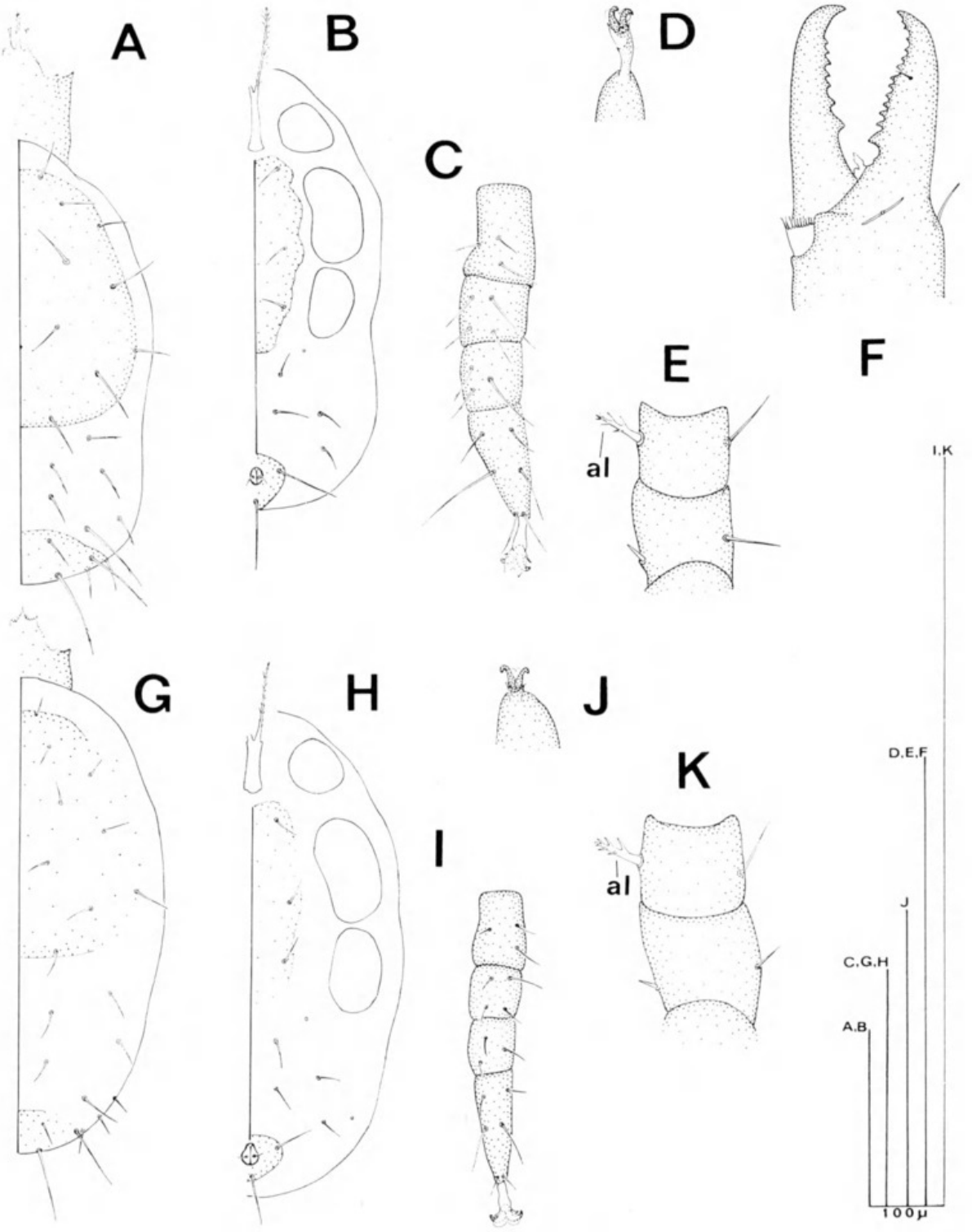

Fig. 7. *Gamasellus* larvae

A-F, *G. concinnus* Womersley: A, soma, dorsum; B, idiosoma, venter; C, leg IV (part), dorsal setae; D, pretarsus I; E, palp femur and genu, venter; F, chelicera.

G-K, *G. cophinus* n.sp.: G, soma, dorsum; H, idiosoma, venter; I, leg IV (part), dorsum; J, pretarsus I; K, palp femur and genu venter.

LARVA. Fig. 7; G,H,I,J,K.

Measurements: idiosomal length—210 (1). Seta *al* on palp genu is spine-like with 6 lateral prongs. Tectum anterior margin is basically trispinate with numerous spinules, and the central spine is longer than lateral spines although the spines are not so well developed as in *Gamasellus concinnus*. Idiosomal shields not clearly defined. Idiosomal setae are simple. Opisthonotal seta *Z*3 (*Z*1 and *Z*2 are absent) is about half as long as seta *Z*4. There are 4 or 5 teeth on fixed cheliceral digit.

LOCAL. *Summit Site*—holotype female (N1970281), allotype male (N1970282), 14 paratype females (N1970283-N1970296) and 9 paratype males (N1970297-N1970305), moss, 7.6.1968-12.9.1968. The morphotype larva (N1970306) was bred from adults from Summit Site, moss, 9.8.1968. *Foothills Site*.

REMARKS. *G. cophinus* is an atypical species of *Gamasellus*; I group it in the *falciger*-complex because of the distribution of idiosomal shields (especially the 3 pairs of pre-endopodal shields), the chaetotaxy, the location of a conspicuous spermathecal access duct, the spine-like seta *av*2 on the male tarsus II and the pronged seta *al*1 on the palp genu which is similar to the homologous seta on *G. concinnus*. Attributes dissimilar to those of other species of *Gamasellus* are regarded as having evolved relatively recently, being adaptive to living in the narrow pore spaces of the more mineral soil layers. Such attributes are the dorso-ventral flattening of the idiosoma, with no fusion between the podosomal and opisthosomal shields in the male as well as the female, the short, simple idiosomal setae and the large, spiny leg IV. I regard the resemblance of *G. cophinus* to the type of species of *Rhodacaroides* as superficial. Specimens from the Foothills Site are indistinguishable from those described.

Gamasellus grossi Lee, n.sp.

FEMALE. Fig. 4; A.

Measurements: idiosomal length—550 (2s, 540-560); appendage lengths—*ch* 55, *pa* 130, *I* 365, *II* 310, *III* 295, *IV* 420; genu breadths—*pa* 25, *I* 42.5, *II* 50, *III* 40, *IV* 42.5. On the notum only 3 pairs of podonotal setae (*j*1, *z*5 and *r*2) and 2 pairs of opisthonotal seta (*Z*5 and *S*4) are pilose and spatulate, standing out at right angles to the cuticle.

MALE. Not figured.

Measurements: idiosomal length—520 (3, 510-530).

LOCAL. *Coastal Site*—holotype female (N1970307), allotype male (N1970308), paratype female (N1970309) and 2 paratype males (N1970310 and N1970311), moss, 10.6.1965.

REMARKS: *G. grossi* is very similar to two other species of *Gamasellus* from South Australia: *G. tragardhi* and *G. cooperi*. *G. grossi* can be distinguished from these species by the number of pilose and spatulate dorsal setae. Otherwise it is so similar to *G. tragardhi* (see Lee, 1970, p. 135) that a complete description has not been given. *G. grossi* has also been collected from Eyre Peninsula, South Australia—2 females (N19715 and N19716) and 2 males (N19717 and N19718), moss, Mount Wedge, col. G. F. Gross, 26.9.1964.

Gamasellus tragardhi (Womersley)

?*Digamasellus tragardhi* Womersley, 1942, p. 161.

Cyrtolaelaps tragardhi (Womersley): Womersley, 1961, p. 194.

Gamasellus tragardhi (Womersley): Lee, 1970, p. 135.

FEMALE. Not figured.

Measurements: idiosomal length—640 (10, 620-670); appendage lengths—*ch* 60, *pa* 150, *I* 390, *II* 345, *III* 320, *IV* 450; genu breadths—*pa* 25, *I* 52.5, *II* 60, *III* 47.5, *IV* 50.

MALE. Not figured.

Measurements: idiosomal length—620 (10, 560-660).

LOCAL. *Summit Site*—10 females (N1970312-N1970321) and 10 males (N1970322-N1970331), plant litter, 16.8.1968. *Foothills Site*.

REMARKS. *G. tragardhi* is also recorded from Adelaide, Bridgewater (about 6 km southeast of the Summit Site) and near Wilmington (about 280 km north of Summit Site). The specimens from the Summit and Foothills Sites are indistinguishable from the types.

Genus ACUGAMASUS Lee, 1970

PUNCTATUS-complex

Acugamasus punctatus (Womersley)

?*Digamasellus punctatus* Womersley, 1942, p. 160.

Cyrtolaelaps punctatus (Womersley): Womersley, 1961, p. 194.

FEMALE. Not figured.

Measurements: idiosomal length—605 (4, 560-630); appendage lengths—*ch* 105, *pa* 180, *I* 550, *II* 425, *III* 385, *IV* 500; genu breadths—*pa* 27.5, *I* 42.5, *II* 55, *III* 45, *IV* 47.5.

MALE. Not figured.
Measurements: idiosomal length—580 (5, 560-600).

LOCAL. *Summit Site*—4 females (N1970332-N1970335) and 5 males (N1970336-N1970340), plant litter, 10.4.1969.

REMARKS. *A. punctatus* is also recorded from Adelaide and the Belair National Park about 8 km south of the Summit Site. The specimens from the Summit Site are indistinguishable from the holotype female (N1970341) and the allotype male (N1970342).

Acugamasus elachyaspis Lee, n.sp.

FEMALE. Fig. 8; A,B,C,D,E.
Measurements: idiosomal length—470 (3, 460-480); appendage lengths—*ch* 85, *pa* 170, *I* 505, *II* 350, *III* 305, *IV* 400; genu breadths—*pa* 25, *I* 30, *II* 37.5, *III* 30, *IV* 32.5. The idiosomal shields are distributed as on other females of the *punctatus*-complex, but they are the least extensive, for example the opisthonotal shield is so narrow that it only carries setal row *J* and *Z* and one seta from row *S*. The chaetotaxy only differs from other species in the *punctatus*-complex in having 4 setae in row *UR*. None of the setae on the idiosoma and legs are spatulate and only a few are pilose. No spermathecal access duct is visible (the structure on the adaxial edge of acetabulum IV—fig. 8C—is the genital apodeme and attached muscles).

MALE. Fig. 8; F,G,H.
Measurements: idiosomal length—430 (2, 420 and 440). The distribution of idiosomal shields is as on the female except on the venter of the podosoma. This contrasts with other Australian members of the *punctatus*-complex in which the males have a section of the podonotal shield, carrying at least setae *r*2 and *r*4, that is split away posteriorly from the rest of the shield and fused to the peritrematal shield. Seta *st*5 is on striated cuticle. The spermadactyl is short and twists under the movable cheliceral digit so its spatulate tip lies close to the adaxial surface of the digit. On leg II, setae *av* on the femur, genu and tibia are enlarged into spurs while setae *pv*1 on the femur and *pv* on the genu are spine-like.

LOCAL. *Coastal Site*—holotype female (N1970343), allotype male (N1970344), 2 paratype females (N1970345 and N1970346) and 1 paratype male (N1970347), moss, col.: M. Fagg, 23.5.1965.

REMARKS. *A. elachyaspis* is the smallest species in the *punctatus*-complex, has the simplest setae and is the most sparsely covered by shields.

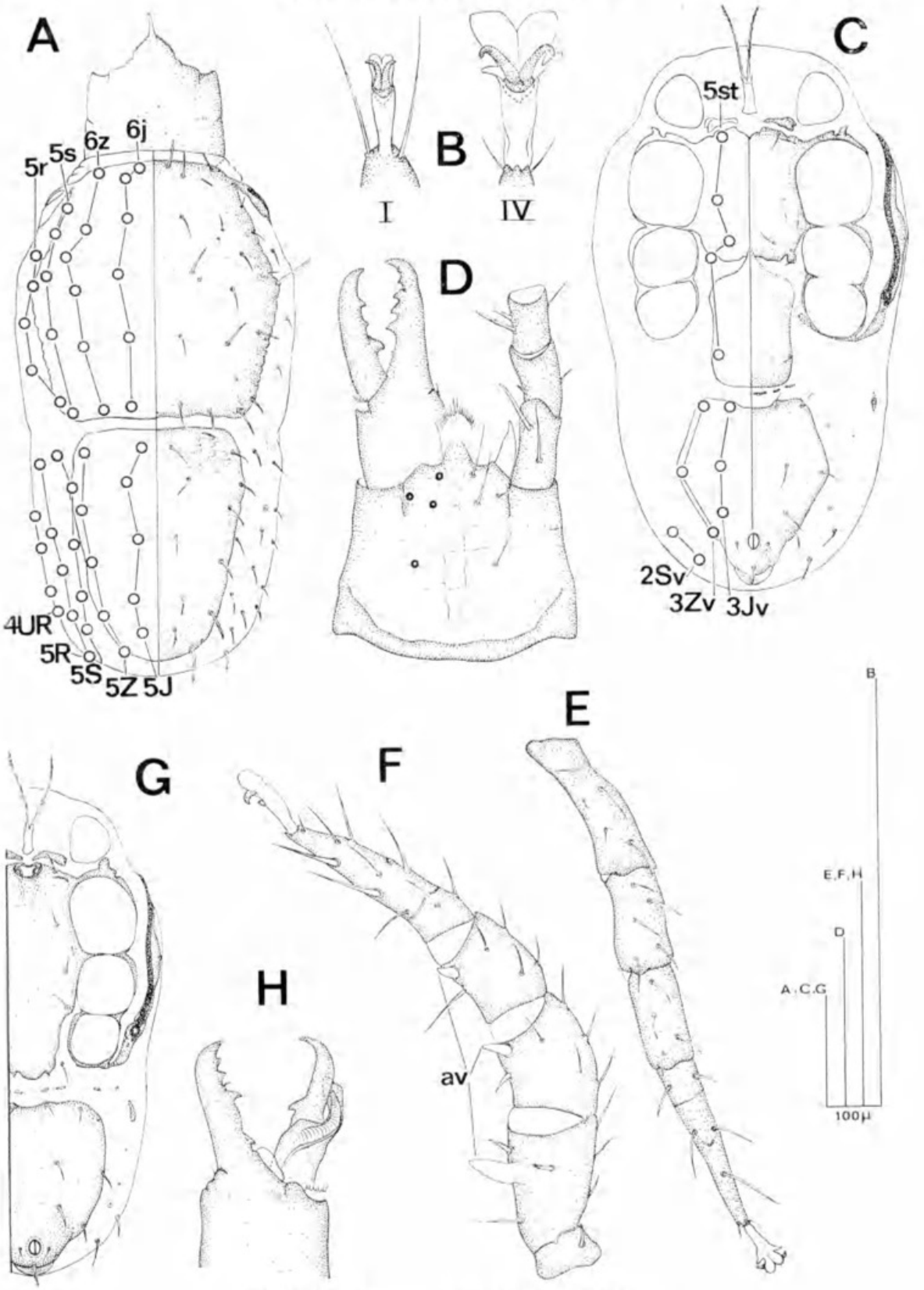

Fig. 8. *Acugamasus elachyaspis* n.sp.

A-E, female: A, soma, dorsum; B, pretarsi I and IV; C, idiosoma, venter; D, gnathosoma, venter; E, leg IV (part), dorsal setae.

F-H, male: F, leg II (part), antero-lateral; G. idiosoma, venter; H, chelicera.

Acugamasus semipunctatus (Womersley)

?*Digamasellus semipunctatus* Womersley, 1942, p. 163.

Digamasellus semipunctatus Womersley: Womersley, 1956a, fig. 20.

FEMALE. Not figured.

Measurements: idiosomal length—725 (4, 700-760); appendage lengths—*ch* 135, *pa* 240, *I* 710, *II* 480, *III* 450, *IV* 620; genu breadths—*pa* 30, *I* 55, *II* 65, *III* 52.5, *IV* 55. Opisthonotal shield is reticulated and the podonotal shield is rugose, but neither shield has the raised punctations that are characteristic of the notal shields of *A. punctatus*.

MALE. Not figured.

Measurements: idiosomal length—670 (4, 650-690). On leg II, setae *av* on the femur, genu and tibia are modified to spurs, while seta *pv*1 on the femur and seta *pv* on the genu are spine-like. There is a non-setous spur on the antero-lateral surface of genu II.

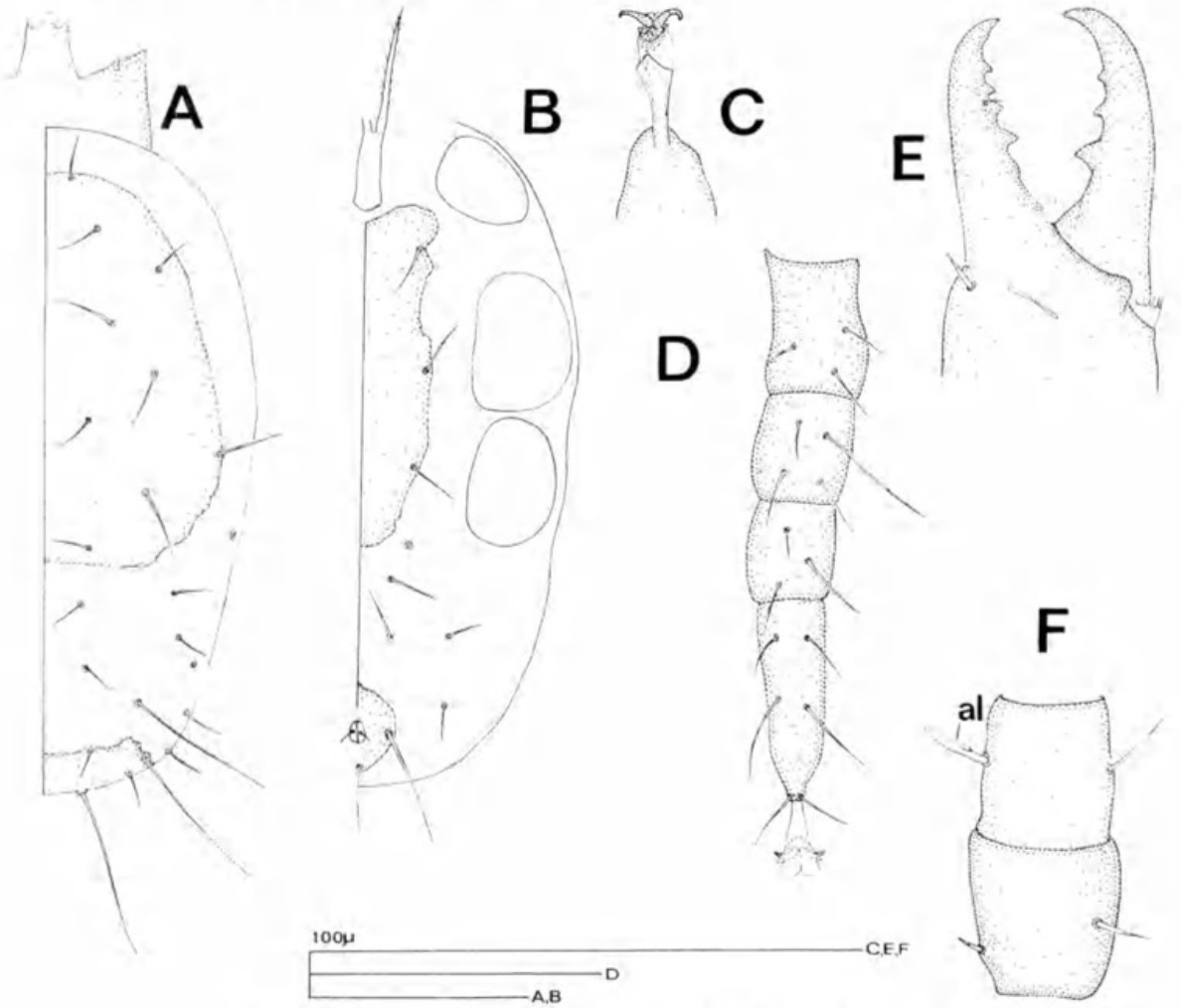

Fig. 9. *Acugamasus semipunctatus* (Womersley) larva
A, soma, dorsum; B, idiosoma, venter; C, pretarsus I; D, leg III (part), dorsal setae; E, chelicera; F, palp femur and genu, venter.

LARVA. Fig. 9; A,B,C,D,E,F.

Measurements: idiosomal length—340 (3, 320-360). Seta *al* on palp genu is lanceolate with one basal prong as in the adult. Tectum anterior margin is basically trispinate with numerous spinules, and central spine is longer than lateral spines. Idiosomal shields clearly defined. Idiosomal setae simple. Opisthonotal seta *Z*3 (*Z*1 and *Z*2 are absent) subequal in length to seta Z4.

LOCAL. *Summit Site*—larva (N1970397), litter, 24.4.1969 and larva (N1970398) bred from adults from this Site. *Foothills Site*—4 females (N1970350-N1970353) and 4 males (N1970354-N1970357), moss, 24.5.1968, and larva (N1970399) containing protonymph, moss, 5.8.1968.

REMARKS. *A. semipunctatus* is the largest species in the *punctatus*-complex. Its name is misleading, since it does not bear any notal punctations similar to those on *A. punctatus*. Womersley (1942) describes these punctations on the podonotal shield, but has drawn this shield as being rugose. The females from the Summit and Foothills Sites are indistinguishable from the holotype female (N1970348), moss, Bridgewater (about 6 km south-east of the Summit Site). A male (N1970349) labelled "allotype", moss, Muston, Kangaroo Island (about 65 km south-west of the Summit Site and separated from the mainland by 11 km of sea) is probably the specimen drawn by Womersley (1956a) with no text description. This male differs from those from near Adelaide in not having a non-setous spur on genu II, but is otherwise indistinguishable.

Genus HINIPHIS Lee, 1970

Hiniphis bipala n.sp.

FEMALE. Fig. 10; A,B,C,D.

Measurements: idiosomal length—300 (3, 300); appendage lengths—*ch* 35, *pa* 100, *I* 205, *II* 185, *III* 140, *IV* 190; genu breadths—*pa* 15, *I* 20, *II* 27.5, *III* 17.5, *IV* 17.5. The notal shield is divided in two. The metasternal shield is fused to the endopodal IV shield. The dorsal and ventral shields are widely separated by striated cuticle except for the narrow anterior fusion of the peritrematal and podonotal shields. Exopodal III shield is not split. The idiosomal chaetotaxy is as for *Hiniphis hinnus* except that there are 3 setae in row *Sv*. Leg chaetotaxy is normal for rhodacarids (as

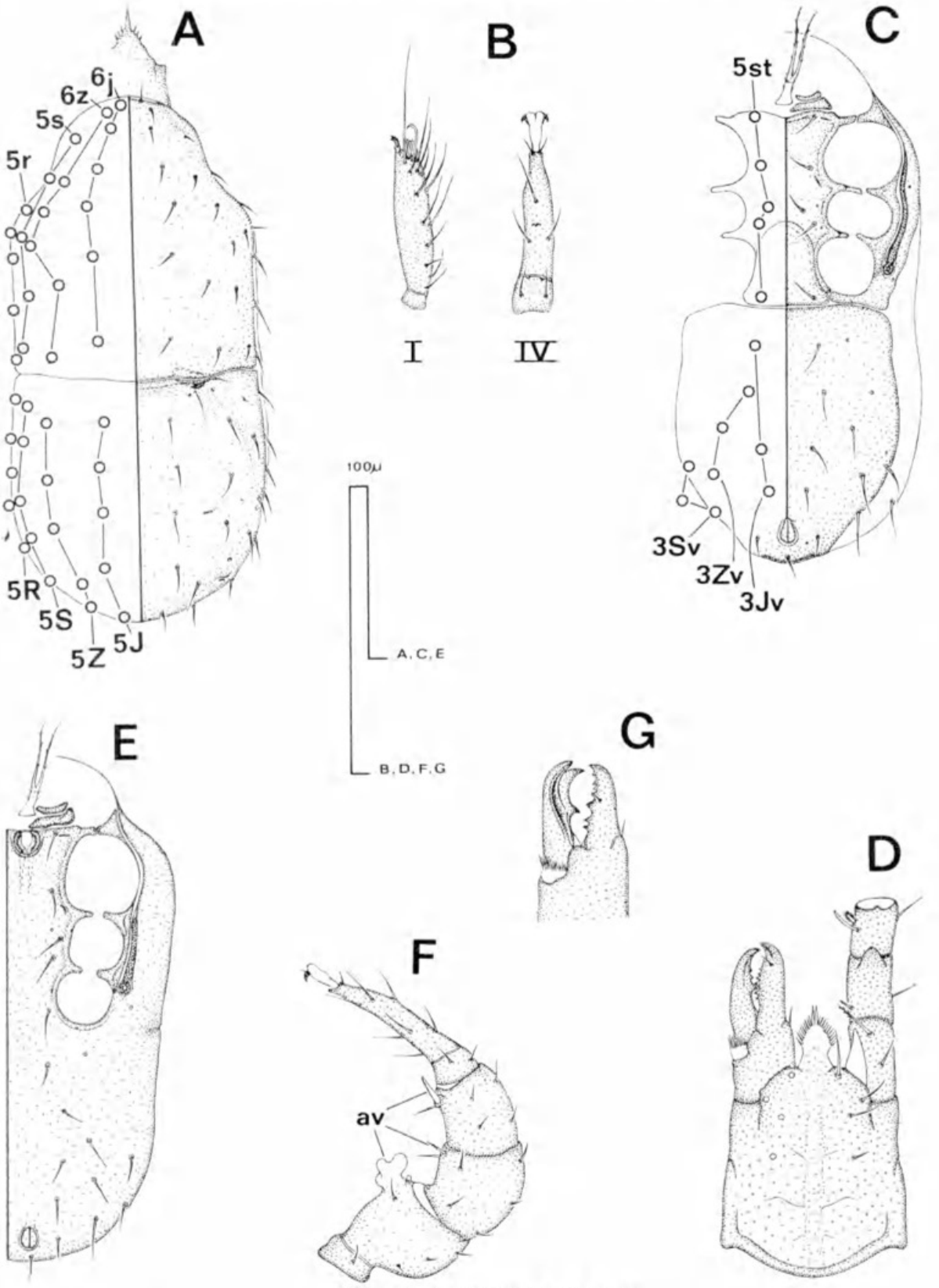

Fig. 10. *Hiniphis bipala* n.sp..

A-D, female: A, soma, dorsum; B, tarsi I and IV, dorsal setae; C, idiosoma, venter; D, gnathosoma, venter.

E-G, male: E, idiosoma, venter; F, leg II (part), antero-lateral; G, chelicera.

Gamasellus). On the palp genu, seta *al*1 is spine-like with about 4 pairs of short, fine lateral prongs. On the palp femur there is a conspicuous non-setous tubercle near the ventro-distal edge. There is a pair of conspicuous pits near the anterior margin of the opisthonotal shield. No recognizable spermathecal access duct.

MALE. Fig. 10; E,F,G.

Measurements: idiosomal length—290 (2, 280-300). Idiosoma is encased in a single continuous shield with a dorsal split, except for the discrete pre-endopodal and anterior exopodal shields. The spermadactyl lies close to the movable cheliceral digit but distally to the single tooth they are separated. There is a tubercle on the palp femur similar to that of the female. On femur II, seta *av* is enlarged to a lumpy tubercle and seta *pv*1 is modified to a small, globular tubercle. Seta *av* on tibia II is spine-like, but seta *av* on genu II is only very slightly stouter than the other setae.

LOCAL. *Summit Site*—holotype female (N1970358), allotype male (N1970359), 2 paratype females (N1970360 and N1970361) and one paratype male (N1970362), plant litter, 5 or 12.8.1968.

REMARKS. *H. bipala* is the only species allotted to *Hiniphis* other than the type (*H. hinnus*). The males of these two species are similar, but the distribution of idiosomal shields on the females differ in that the dorsal shields are extensively fused to the ventral shields of *H. hinnus*. On the other hand females of both species have two attributes (fusion of the metasternal and endopodal IV shields, and separate podonotal and opisthonotal shields) not found together on other females of Ologamasinae, although they occur together in *Euepicrius* (Gamasiphinae) and *Onchogamasus virguncula* (Sessiluncinae).

Genus RHODACAROIDES Willmann, 1959

Rhodacaroides minyaspis Lee, n.sp.

FEMALE. Fig. 11; A,B,C,D.

Measurements: idiosomal length—300 (5, 300-310); appendage lengths—*ch* 80, *pa* 115, *I* 310, *II* 250, *III* 220, *IV* 280; genu breadths—*pa* 25, *I* 25, *II* 27.5, *III* 25, *IV* 32.5. The extent of the idiosomal shields is unusually reduced; only part of setal row *J* and *Z* are on the opisthonotal shield; the peritrematal shield hardly exists; there is no ventral shield so that

setae in row *Jv* and *Zv* are on striated cuticle. The dorsal chaetotaxy of the idiosoma is reduced, with only 12 pairs of setae on the opisthonotum. Leg chaetotaxy is normal for rhodacarids (as *Gamasellus*). On the palp genu, seta *al*1 is spine-like with 4 prongs on one side and 2 prongs on the other side. On the palp femur there is a small, non-setous tubercle on the mid-ventral surface. No spermathecal access duct is visible. Pretarsus I is absent.

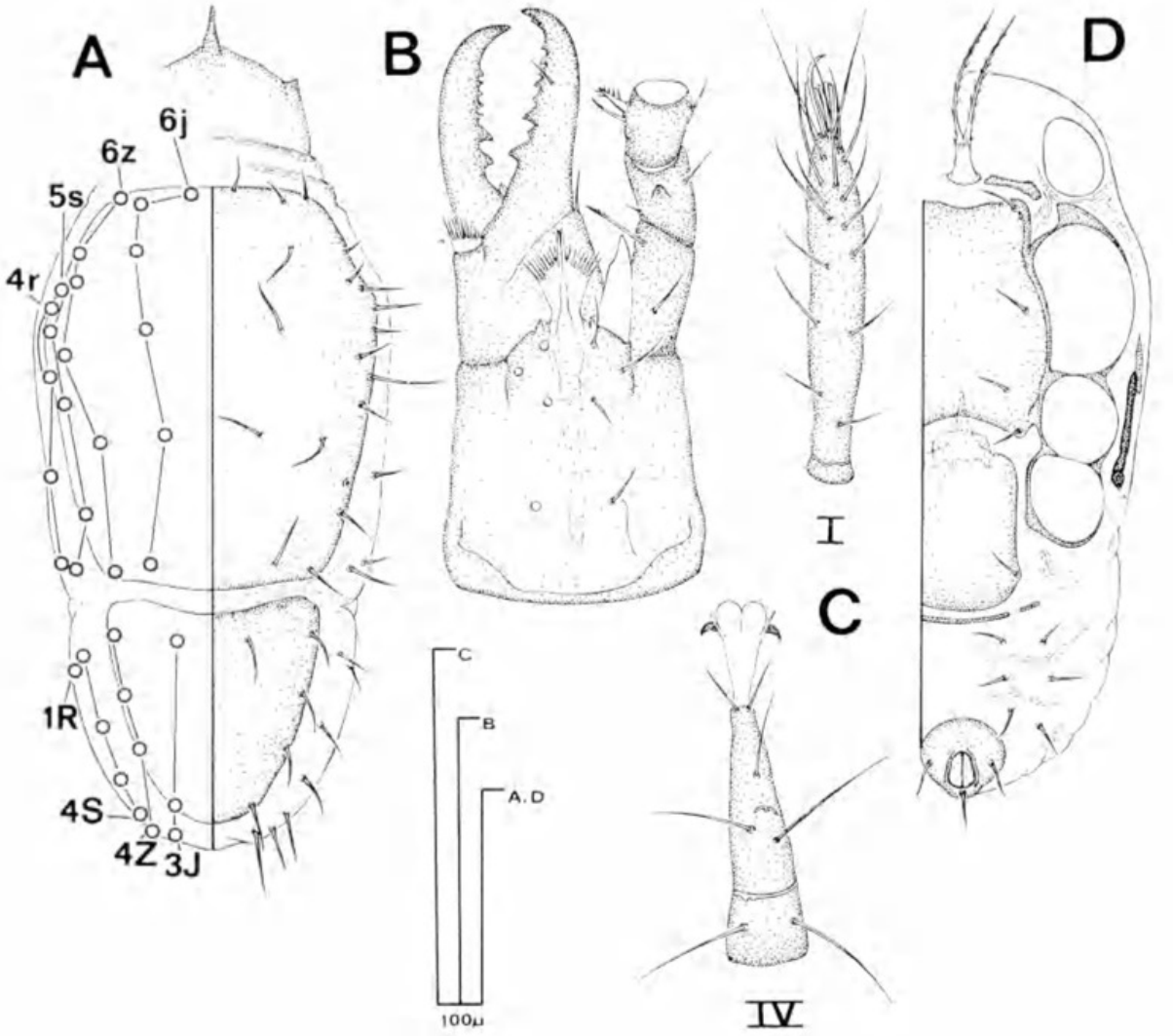

Fig. 11. *Rhodacaroides minyaspis* n.sp., female
A, soma, dorsum; B, gnathosoma, venter; C, tarsi I and IV, dorsal setae; D, idiosoma, venter.

MALE. Not known.

LOCAL. *Summit Site*—holotype female (N1970363) and 4 paratype females (N1970364-N1970367), plant litter, 12.8.1968 (holotype) or 10 or 24.4.1969.

REMARKS. *R. minyaspis* is unique amongst rhodacarids in having only an anal shield on the venter of the opisthosoma. Because I have no males of this species it is tentatively grouped in *Rhodacaroides*. There are 3 nominal species in the genus, and *R. minyaspis* is more similar to *R. costai* from South America than to the type (*R. aegyptiacus*) from Egypt.

Genus SOLUGAMASUS Lee, n.gn.

Type-species: *Solugamasus mustela* Lee, n.sp.

DIAGNOSIS. Small mites. Separate podonotal and opisthonotal shields. Ventro-anal shield discrete in both sexes. Sterno-metasternal shield of female never fused to endopodal IV shield. Two pairs of pre-endopodal shields (in series rather than parallel). Twenty-two pairs of podonotal setae. Leg chaetotaxy is normal for rhodacarids (as *Gamasellus*). On palp genu, seta *al*1 has two pairs of lateral prongs and seta *al*2 is lanceolate. Dorsal setae all simple, tapering. Location of spermathecal access duct is unknown. The spermadactyl is strongly recurved. On the male leg II at least setae *av* on the femur, genu and tibia are modified to spurs. Pretarsus I sometimes absent. Legs I and IV are long (0.9 or more of idiosomal length) and there is medium variation in leg thickness) using breadth of genu: I is approximately 0.8 of II; III is approximately 0.75 of IV).

REMARKS. *Solugamasus* is similar to *Rhodacaroides*, but I recognize it as a distinct genus because of the strongly recurved spermadactyl in the male. A recurved spermadactyl occurs in widely differing rhodacarid genera such as *Rhodacarus, Pyriphis* and *Sessiluncus* but its occurrence never varies within a genus. The female of the only nominal species in *Solugamasus* is easily distinguished from the 3 nominal species of *Rhodacaroides* by, among other attributes, its unusually short idiosomal setae. On the other hand, I do do not specify any female attributes as distinguishing these two genera.

Solugamasus mustela Lee, n.sp.

FEMALE. Fig. 12; A,B,C,D.

Measurements: idiosomal length—290 (7, 270-300); appendage lengths—*ch* 50, *pa* 90, *I* 280, *II* 240, *III* 200, *IV* 290; genu breadths—*pa* 17.5, *I* 20, *II* 25, *III* 20, *IV* 27.5. The extent of the idiosomal shields is reduced so that setae *r*3, *r*4, *R*1 and *Zv*1 are on striated cuticle. The opisthonotal chaetotaxy is reduced to 12 pairs of setae. On the palp genu, seta *al*1 has two pairs of lateral prongs very near the tip. On the palp trochanter, seta *av* is spine-like and set on a tubercle. The idiosomal setae are simple and very short. Pretarsus I is absent.

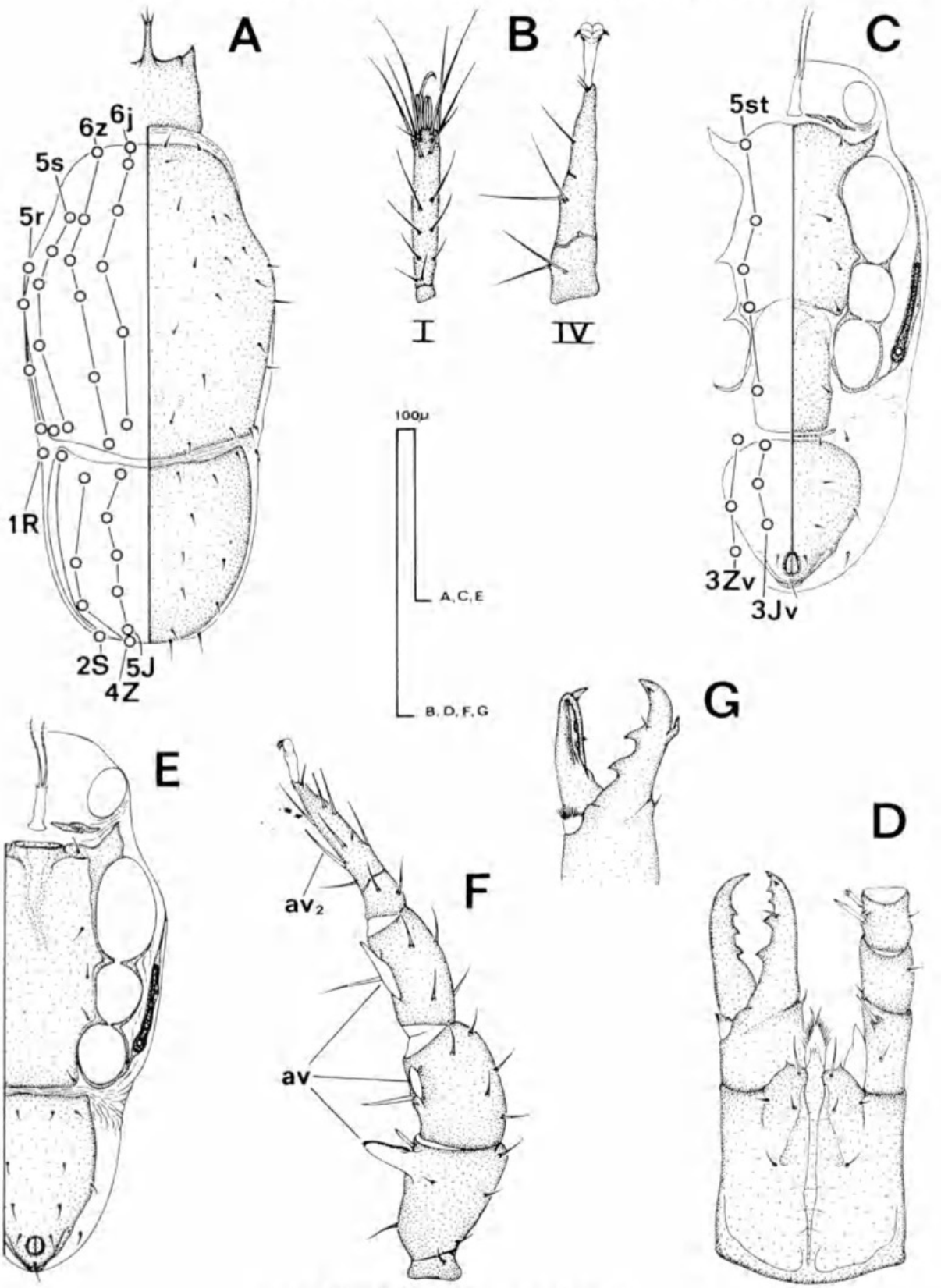

Fig. 12. *Solugamasus mustela* n.sp..

A-D, female: A, soma, dorsum; B, tarsi I and IV, dorsal setae; C, idiosoma, venter; D, gnathosoma, venter.

E-G, male: E, idiosoma, venter; F, leg II (part), antero-lateral; G, chelicera.

MALE. Fig. 12; E,F,G.

Measurements: idiosomal length—270 (3, 270-280). The distribution of idiosomal shields is similar to the female, but the anterior shoulders of the ventro-anal shield extend forward to carry seta *Zv*1. The spermadactyl is strongly recurved and there is a small dorsal process on the fixed digit. On leg II, seta *av* on the femur, genu and tibia are enlarged into spurs while some other ventral setae are long and spine-like.

LOCAL. *Foothills Site*—holotype female (N1970368), allotype male (N1970369), 6 paratype females (N1970370-N1970375) and 2 paratype males (N1970376 and N1970377), moss and plant litter, 9.5.1968-30.1.1969.

REMARKS. See remarks on genus.

Subfamily SESSILUNCINAE Lee, 1970

Genus ANTENNOLAELAPS Womersley, 1956b

Antennolaelaps aremenae Lee, n.sp.

FEMALE. Fig. 13; A,B,C,D,E.

Measurements: idiosomal length—745 (3, 720-760); appendage lengths—*ch* 75, *pa* 210, *I* 870, *II* 570, *III* 525, *IV* 730; genu breadths—*pa* 32.5, *I* 55, *II* 75, *III* 52.5, *IV* 55. Horizontal outline of idiosoma is nearly parallel-sided. The pre-endopodal shields lie very close to the sterno-metasternal shield but are probably separate from it. The opisthonotal chaetotaxy is reduced to 15 pairs of setae (as *Antennolaelaps testudo*). Leg chaetotaxy is normal for rhodacarids (as *Gamasellus*). On the palp genu, seta *al*1 has 4 pairs of lateral prongs, and seta *al*2 is lanceolate. On the gnathosoma, the fourth hyposternal seta is pilose. The idiosomal setae are all simple and some podonotal setae are very small. Pretarsus I is pedunculate.

MALE. Fig. 13; F,G,H.

Measurements: idiosomal length—690 (4, 670-710). Ventro-anal shield is not fused to the sternito-genital or exopodal IV shield; on the other hand it is more extensive than in the female so that posteriorly there is hardly any striated cuticle between it and the notal shield. The tectum bears an extra pair of spinules on the central spine that are not present on the females.

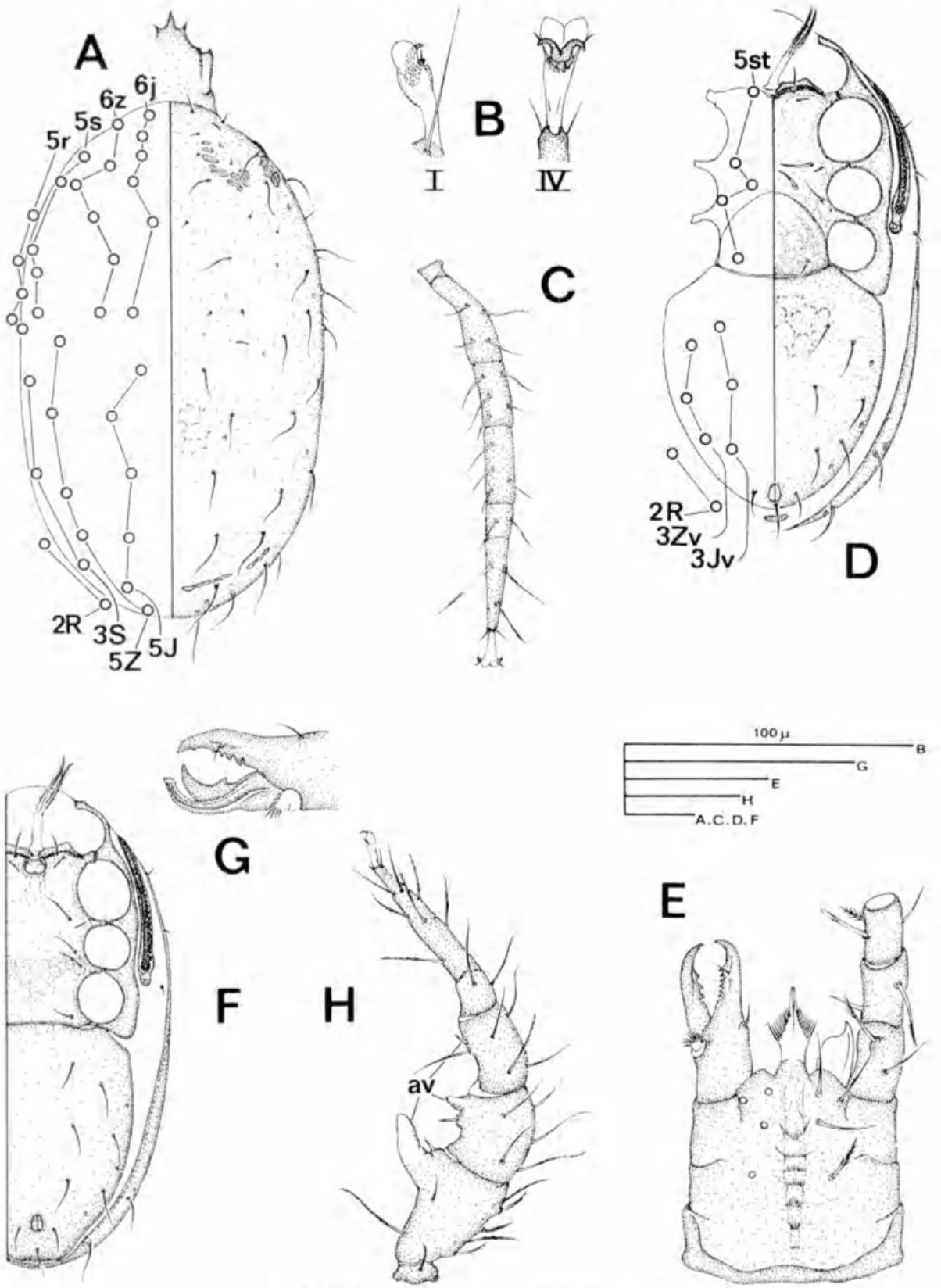

Fig. 13. *Antennolaelaps aremenae* n.sp..

A-E, female: A, soma, dorsum; B, pretarsi I and IV; C, leg IV (part), dorsal setae; D, idiosoma, venter; E, gnathosoma, venter.

F-H, male: F, idiosoma, venter; G, chelicera; H, leg II (part), antero-lateral.

The spermadactyl is of similar shape to the movable cheliceral digit except that the tip is almost spatulate. On leg II, setae *av* on the femur and genu are enlarged into spurs, while seta *av* on the tibia is spine-like.

LOCAL. *Summit Site*—allotype male (N1970380), 2 paratype females (N1970381 and N1970382) and 3 paratype males N1970383-N1970385), moss or plant litter, 9.5.1968-12.8.1968. *Foothills Site*—holotype female (N1970379), moss, 24.5.1968.

REMARKS. *A. aremenae* is the largest species in the genus and its idiosoma is nearly-parallel sided, as for *A. celox*, in contrast to the 3 species described from Queensland which are suboval or subcircular in horizontal outline. There are many attributes which distinguish this species from the 3 previously described species (see Lee, 1970), amongst which is the variable size of the podonotal setae with both very small and averaged sized setae in rows *j* and *z*. *A. aremenae* is unusual amongst species of Sessiluncinae in having sexual dimorphism in the size of the ventro-anal shield.

Antennolaelaps celox Lee, n.sp.

FEMALE. Fig. 14; A.

Measurements: idiosomal length—545 (5, 530-560); appendage lengths—*ch* 55, *pa* 160, *I* 600, *II* 460, *III* 400, *IV* 580; genu breadths—*pa* 25, *I* 40, *II* 50, *III* 37.5, *IV* 40. *A. celox* is similar to *A. aremenae*. The following attributes differ: it is smaller; the fourth hypostomal seta is not pilose; there is a semicircular ridge around sternal pore 2 and seta *st*2 (as on male see fig. 14B); there are 18 pairs of opisthonotal setae; the longer opisthonotal setae are pilose and more of the dorsal setae are very small, including some on the opisthonotum.

MALE. Fig. 14; B and D.

Measurements: idiosomal length 505 (3, 500-510). Ventro-anal shield is of similar size to that of the female so that posteriorly there is a conspicuous strip of striated cuticle between it and the dorsal shield. On leg II, seta *pv* on the genu is pilose and of a similar length to seta *pv* on the tibia.

DEUTONYMPH. Fig. 14; C.

Measurements: idiosomal length—415 (2, 410-420). The majority of dorsal setae are nearly as long as the distance between their setal bases in contrast to their small size in the adult.

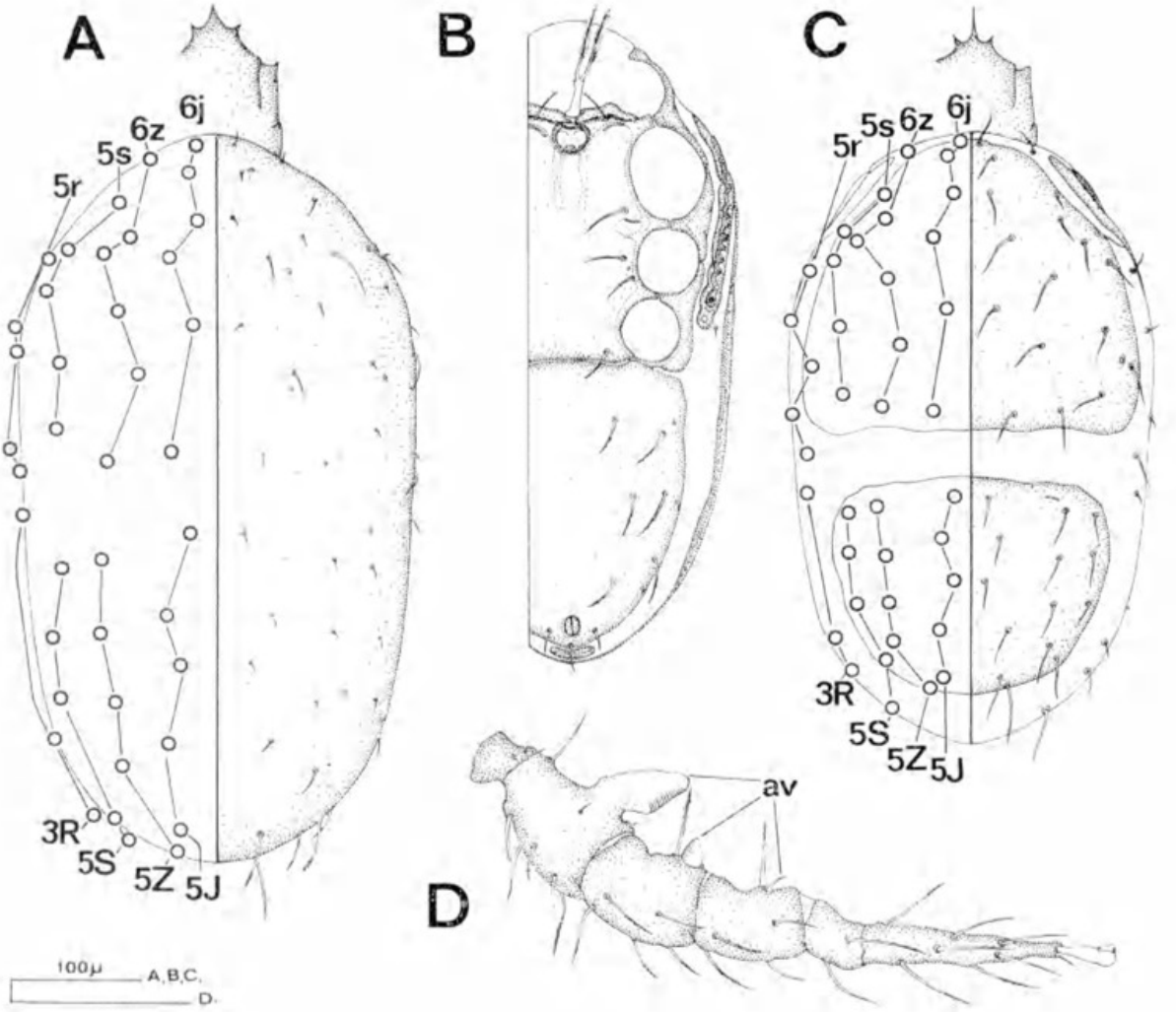

Fig. 14. *Antennolaelaps celox* n.sp..
A, female, soma, dorsum; B, male, idiosoma, venter; C, deutonymph, soma, dorsum; D, male, leg II, antero-lateral.

LOCAL. *Summit Site*—holotype female (N1970386), allotype male (N1970387), 4 paratype females (N1970388-N1970391), 2 paratype males (N1970392 and N1970393), one morphotype deutonymph (N1970394) and one paratype deutonymph (N1970395), moss or plant litter, 9.5.1968-4.7.1968. *Foothills Site*.

REMARKS. *A. celox* is similar to *A. aremenae*, but smaller and more dorsal setae are very small. Specimens from the Foothills Site are indistinguishable from those described.

Genus ONCHOGAMASUS Womersley, 1956b

Onchogamasus virguncula Lee, n.sp.

FEMALE. Fig. 15; A,B,C,D,E,

Measurements: idiosomal length—310 (1); appendage lengths—*ch* 40, *pa* 110, *I* 275, *II* 200, *III* 175, *IV* 255; genu breadths—*pa* 15, *I* 20, *II* 30, *III* 17.5, *IV* 25. Separate podonotal and opisthonotal shield, with opposing edges touching. Three pairs of pre-endopodal shields. The sterno-metasternal shield is fused to endopodal IV shield. Ventro-anal shield is discrete, but its anterior edge lies very close to the ventral podosomal shields. Exopodal II and III shields are split. The peritrematal shield is free posteriorly. Idiosomal chaetotaxy—6*j*, 6*z*, 5*s*, 5*r*: 5*st*: 3*Jv*, 3*Zv*, 2*Sv*, 3 *anal*. Leg chaetotaxy is abnormal for rhodacarids (not as *Gamasellus*) in lacking seta *pd*4 on tarsus IV. Movable cheliceral digit has at least 5 teeth. On palp genu, seta *al*1 pilose with 5 pairs of lateral prongs and seta *al*2 is spine-like. Dorsal setae simple and tapering. On the sternum, a line joining setae *st*2, *st*3 and *st*4 would enclose an angle of less than 95°. Pretarsus I present but not pedunculate. Femur IV with 2 non-setous tubercles on ventral surface.

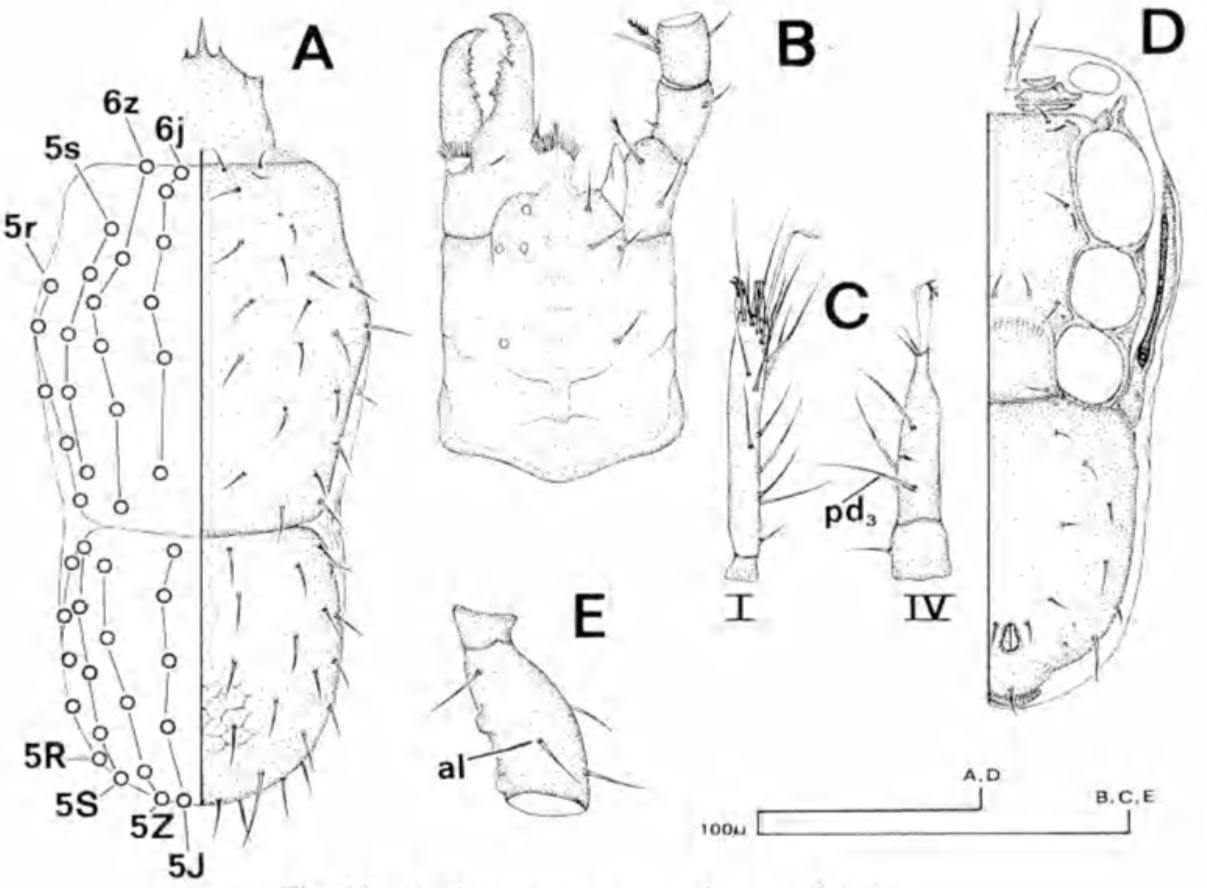

Fig. 15. *Onchogamasus virguncula* n.sp., female
A, soma, dorsum; B, gnathosoma, venter; C, tarsi I and IV; D, idiosoma, venter; E, femur IV.

MALE. Not known.

LOCAL. *Summit Site*—holotype female (N1970396), plant litter, 5.8.1968.

REMARKS. Amongst species of Sessiluncinae, *O. virguncula* is unique in having 3 pairs of pre-endopodal shields, and the only other species with a divided dorsal shield belongs to *Paragamasellevans*. The chaetotaxy is unique amongst rhodacarids; combining the absence of seta *pd*4 on tarsus IV (as *Gamasellopsis*) with an otherwise normal leg chaetotaxy (as *Gamasellus*). Because of the position of the female sternal setae (which would be diagnostic of *communis*-complex) and the absence of fusion between the peritrematal and exopodal shields (diagnostic of *pumilio*-complex), I revoke my previous concept (Lee, 1970, p. 189) of *Onchogamasus* including two species-complexes. Furthermore, the attributes of *O. virguncula* lessen the gap between the attributes of *Onchogamasus* and those of *Gamasellopsis* and *Gamasitus*, so that if males of the types of these 3 genera prove to be similar the possibly synonomy of these names should be considered.

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